A STUDY OF THE PERFORMANCE OF DAIRY & PIGGERY ENTERPRISES AND THEIR IMPACT ON RURAL ECONOMY OF NAGALAND

A THESIS SUBMITTED TO
THE DEPARTMENT OF COMMERCE,
NAGALAND UNIVERSITY, FOR THE AWARD OF
DOCTOR OF PHILOSOPHY IN COMMERCE.

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CERTIFICATE

This is to certify that the work recorded in the thesis titled ***"A STUDY OF THE PERFORMANCE OF DAIRY & PIGGERY ENTERPRISES AND THEIR IMPACT ON RURAL ECONOMY OF NAGALAND",*** *submitted by* ***K. AVELE THIRAH*** *bearing Reg. No. 440 / 2011, for the award of the degree of Doctor of Philosophy in Commerce, Nagaland University is faithful and the bonafide work was carried out under my personal supervision and guidance.*

I certify that this is a record of work done by the candidate herself and that to the best of my knowledge, the contents of this thesis did not form a basis award of any previous degree to anybody else.

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DECLARATION

I, K. AVELE THIRAH, bearing Reg. No. 440/2011, do hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any Research Degree in any other University.

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ACKNOWLEDGEMENT

First and foremost, I humbly thank God for his grace and for being my strength and my guide.

I would like to express my sincere gratitude to my Supervisor, Prof. Parag Kr. Deka for the continuous support of my Ph.D study and related research, for his patience, motivation, enthusiasm, insightful comments and suggestions which incented me to widen and better my research from various perspectives. I would also like to thank all the faculty members of Commerce department, Nagaland University, for their support and encouragement during the course of my research.

In the process of completing this thesis, I have liberally drawn the materials from various libraries like the Central library, Nagaland University; State library, Kohima; Central Library, Kolkata; Jawaharlal Nehru University Library, New Delhi; Delhi University Library; Central Library, Banaras Hindu University; Central Library, Guwahati University; to name a few. The time spent at the library of these Universities has been highly productive, for which I am grateful. I also express indebtedness to those writers whose books have been consulted.

Completing this research required more than academic support and I have many people to thank for bearing with me throughout the time needed to complete my Ph.D. I am forever grateful to my friends, my colleagues, my

family members and my in-laws for their relentless support and the sacrifices they had to make on my behalf. Special thanks to my friend Dr. Satya Bhushan for providing insight and expertise which greatly assisted the research.

I am grateful to all my friends from different districts who helped in conducting interviews and sample survey. My sincere gratitude to all the respondents in this research undertaking for their time and willingness to share their knowledge thus helping me in completion of my research study.

My heartfelt thanks goes to my sister Ms. Johile Thirah; Thank you dear, for lifting my spirits with your cheerful attitude, for the stimulating discussions and your untiring dedication in assisting me whenever needed.

Most importantly, none of this would have been successful without the unwavering trust and support of my husband, Mr. Khosa Swuro, who provided me moral support to persevere and inspired me to complete the present venture within the stipulated time. This thesis stands as a testament to your unconditional love and encouragement.

Date: **K. AVELE THIRAH**

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ABBREVIATIONS

- MoFPI = Ministry of Food Processing Industry.
- NER = North Eastern Region.
- RRBs = Regional Rural Banks.
- AH = Animal Husbandry.
- NMPS = National Mission for Protein Supplements.
- ATMA = Agricultural Technology Management Agency.
- NSSO = National Sample Survey Organisation
- Kcal/day = Kilo Calorie per Day
- FAO = Food and Agriculture Organization.
- ILRI = International Livestock Research Institute.
- MSME's = Micro Small and Medium Enterprises
- OF = Operation Flood.
- NE = North East.
- Ha = Hectares.
- SNF = Solids-Non-Fat.
- TS = Total Solids.
- pH = Potential of Hydrogen.
- SqKm = Square Kilometers.
- GDP = Gross Domestic Product.
- NABARD = National Bank for Agriculture and Rural Development.
- Kg/Year = Kilogram Per Year.
- RKVY = Rashtriya Krishi Vikas Yojana.
- SPDD = Special Programme for Dairy Development.
- SLSC = State Level Sanctioning Committee.

- DPR = Detailed Project Report.
- PCIC = Project Coordination and Implementation Committee.
- QPRs = Quarterly Progress Reports.
- ICAR = Indian Council of Agricultural Research.
- PRIs = Panchayati Raj Institutions.
- SLSC = State Level Sanctioning Committee.
- GSDP = Gross State Domestic product.
- MoU = Memorandum of Understanding.
- PPP = Public Private Partnership.
- KOMUL = Kohima Milk Union Ltd.
- DIMUL = Dimapur Milk Union Ltd.
- MILKCON = Milk Co-Operatives Of Nagaland.
- AMUL = Anand Milk Union Ltd.
- IDDP = Integrated Dairy Development Project.
- BMCUs = Bulk Milk Cooler Units.
- UHT = Ultra High Temperature.
- SDVOs = Sub-Divisional Veterinary Officers.
- DCS = Dairy Co-Operative Societies.
- WDCS = Women Dairy Co-Operative Societies.
- CEO = Chief Executive Officer.
- GM = General Manager.
- STEP = Support to Training & Employment programme for Women.
- AI = Artificial Insemination.
- CFB = Complete Feed Block.

- FMD = Food and Mouth Disease.
- FIP = Farmers Induction Programme.
- WAMUL = West Assam Milk Union Ltd.
- QCPs = Quality Check Programmes.
- SAUs = State Agriculture Units.
- WC = Watershed Committee.
- SAP = State Agriculture Plan.
- DAP = District Agriculture Plan.
- SLSC = State Level Sanctioning Committee.
- NGO = Non Government Organisation.
- APC = Agricultural Production Commissioner.
- BPL = Below Poverty Line.
- NRCP = National Research Centre on Pigs.
- DVO = District Veterinary Officer.
- NEPED =Nagaland Empowerment of People through Economic Development.
- NRTT = Navaj Bhai Ratan Tata Trust
- HIV = Human Immuno Deficiency Virus.
- SDVOs = Sub Divisional Veterinary Officers.
- NSDCF = Nagaland State Dairy Co-Operative Federation Ltd.
- SSI = Small Scale Industries.
- NPCBB = National Project on Cattle and Buffalo Breeding.
- NDRI = National Dairy Research Institute.
- MPOs = Milk Producer Organisations.
- CGI = Corrugated Galvanized Iron.
- BAHS = Basic Animal Husbandry Statistics.

- ITK's = Indigenous Technical Knowledge
- HYV = High Yielding Variety.
- PRRS = Porcine Reproductive Respiratory Syndrome.
- PRIs = Panchayati Raj Institutions.
- SIA = State Implementing Agency.
- NSPCF = Nagaland State Piggery Cooperatives Federation.
- UNPD = United Nations Procurement Division.
- MRP = Marked Retail Price.
- HYV = High Yielding Variety.
- NGOs = Non Government Organisations.
- VIP = Very Important Person.
- NSPCF = Nagaland State Piggery Cooperatives Federation
- NSDCF = Nagaland State dairy Co-Operative Federation.
- CHD = Centre for Human Development.
- DDD = Dairy Development Department.
- RGI = Revenue Generated Index

CHAPTER I

INTRODUCTION

INTRODUCTION

The Chamber's dictionary describes Enterprise as an undertaking or new project, esp. when bold or dangerous; readiness, initiative, and daring in undertaking, enterprise culture: a culture based on an economic policy that encourages commercial initiative and audacious, imaginative planning. An Entrepreneur is a person who undertakes an enterprise, specially a commercial one and usually at personal financial risk. Both dairy and piggery enterprise mostly comes under entrepreneurial set up/enterprise. Farming system is an integrated set of activities that farmers perform in their farms under their resources and circumstances to maximize the productivity and net farm income on a sustainable basis. Dairy and piggery enterprises have become an integral part of farming. Animals are used for a variety of reasons, including meat, eggs and dairy production, as well as for draught power or future breeding. Dairy is a place where milk is kept and butter and cheese made; a shop where milk and other dairy produce is sold. Piggery is a place where pigs are kept. Dairy farming is a class of agricultural or animal husbandry enterprise, for long term production of milk with cattle reared mainly for the production of milk as opposed to meat as in piggery enterprises. Though Animal Husbandry includes the feeding management and breeding of domesticated animals, it is not a single entity but a combination of several disciplines (nutrition, physiology, behavior, and genetics) interacting with and equally dependent on Agricultural Technology, Agricultural Economics, Agricultural Engineering and Human cultural and Social Phenomena. The interdependency of crop enterprise and livestock production which includes dairy and piggery enterprise is an age-old recognition and the same is evidenced in India by the livestock providing motion power and manure; the basic infrastructure for Crop Enterprise. Historically; dairy farming and pig rearing has been part of agriculture for thousands of year, though it had been known to have been one part of small,

diverse farms and smaller operations predominated. In the last century, large scale dairy farming and pig rearing have emerged with farmers realizing the economic viability and its benefits as an alternate source of sustenance.

Urbanization and increasing incomes are major drivers of expected changes in consumption patterns. Over recent decades, many emerging economies of Western Asia, Northern Africa, Latin America and Eastern Asia have seen fast and significant changes in food consumption levels and patterns. Per capita food availability in these regions is now close to 3000 kcal/day. Roots, tubers and coarse grains have gradually been replaced by increasing consumption of wheat, rice, sugar, vegetable oils, and meat and dairy products. In contrast, sub-Saharan Africa and Southern Asia are still well below the 2500 kcal/person/day threshold. Over the next four decades, the world's population is forecast to increase by 2 billion people to exceed 9 billion people by 2050. Recent FAO estimates indicate that to meet the projected demand, global agricultural production will have to increase by 60 percent from its 2005–2007 levels. Globally, livestock production is the largest user of agricultural land. Significant changes are occurring in the composition of livestock production (live animals). Growth has gradually declined for cattle, from almost 2 percent per year in the 1960s to less than 1 percent per year over the last decade. Pig stocks have experienced an even more radical decline, from a growth rate of more than 4 percent per year 50 years ago to only 0.8 percent per year since 2000. The production of live animals and the world food economy is increasingly driven by a shift in diet and food consumption pattern towards livestock products. Over the last decade, consumption of meat in the developing countries of Asia, where the bulk of the world population lives increase has taken place , has been growing by about 3 percent per annum and dairy product consumption by almost 5 percent. Aggregate agricultural output is affected by these trends, not only through the increase in livestock production itself, but also through the

linkage of livestock production to the crop sector which supplies feedstuffs, mainly cereals and oilseeds. Fast growth in the meat sector has been underpinned by rising demand for poultry meat, which has consistently increased at about three times the rate of population growth over each of the past five decades. For other meats, per capita production growth has been stagnant or negligible, especially for ruminants (beef, sheep and goats) and pigs (when China is excluded). Moreover, in many developing countries, where the need to increase protein consumption is greatest, the productive sector has not participated in the "livestock revolution". For instance, there are still about 20 developing countries where per capita meat consumption is below 10 kg/year, compared with an average of 80 kg/year in developed countries. Cultural or religious reasons may explain this feature in some countries, but low productive capacities are, by and large, the main cause in many. Growth of world milk production and consumption has been far less buoyant. Until recently, per capita growth was largely stagnant, remaining unchanged for several decades. Per capita consumption in developing countries continues to be well below that in industrial countries, partly reflecting consumption habits as well as low incomes and poverty, but the gap is gradually closing, especially in Eastern and Southern Asia. For example, in Eastern Asia, per capita dairy intake has more than doubled in the past decade.

Feed demand for cereals is often considered a dynamic element that conditions the growth of the cereals sector, especially in developed countries. Recently, however, particularly in developing regions, this dynamism has been largely absent and growth in livestock production has by far outstripped growth in compound feed demand. Therefore, the world is obtaining more meat, milk and eggs per kilogram of cereal-based feed, which points to productivity gains in livestock production. Some of these improvements are linked to changes in the composition of livestock production, as poultry

requires far smaller quantities of cereal feed per kilogram of meat than, for instance, beef. Other forces have also led to the reduced grain–meat ratios. Among these is the growing use of oil meals in livestock feeding. World output of soya beans, which are mainly processed into oil and high protein oil meal, grew by more than 4 percent per annum in the last decade and by 5 percent in the 1990s. By implication, the production and consumption of soybean meal as feed has risen by the same levels, suggesting a relative increase in the feed use of oil meals at the expense of feed grains. A principal factor has been the expansion of livestock production systems in developing countries with lower average grain–meat ratios. The continued growth of developing countries' share in world livestock output is associated with a shift from grazing and "backyard" production to stall-fed systems, relying on concentrated feeds. Consequently, changes in production systems tend to raise the average grain–meat ratios of these developing countries, thus compensating for the opposite trends that result from improvements in productivity.

In India, Dairy and piggery business has been practiced for innumerable number of years but it is not at all being done scientifically. The farmers are interested in these businesses since it requires no formal education and has been in vogue since time immemorial. At the same time it is imperative that the approach of this farming needs to be changed by way of educating farmers and guiding them both practically as well as commercially which will help them in economizing their methods, enabling them to make better returns on investment. India is today the largest producer of milk in the world with an estimated production of 127.90 million tonnes [2011-12], which constitutes roughly 17% of the world's milk production with an estimated growth rate of 4% per annum. Amongst the agricultural commodities in India, milk is the largest contributor to the Gross National Product. But, the average size of the farm has been declining and over 80

million out of 105 million operational holdings are below the size of one hectare and pose a serious problem in general. The farmers; particularly the small farmers are unable to meet both ends with the income from cropping alone. The situation is further weakened due to repeated failure of monsoon on one side and on the other side, due to ever increasing population and decline in per capita availability of land. Therefore, dairy and piggery sector is important for various reasons in our country. Among these, its complementarities with agriculture and enrichment of protein diet are significant. Besides these functions, it also play a role in balancing the rural inequity. As India enters an era of economic reforms, agriculture; particularly the livestock sector, is positioned to be a major growth area. The fact that dairy and piggery could play a more constructive role in promoting rural welfare and reducing poverty, is increasingly being recognized. These sectors help the rural poor in having additional regular income. In recent decades, the dairy and piggery sectors has emerged as an important source of rural employment and income in the country. However, these developments are not uniform across the nation. While southern and western Indian regions have shown tremendous growth in Dairy sector, the central region has been lagging behind. In piggery sectors, urban areas have seen emerging large farms. Rural areas, still have small domestic farms with piggery being just an additional support system to actual primary sustenance activity of agriculture.

The growth of the dairy sector in India during the last three decades has been impressive, at more than five percent per annum and the country has emerged as the largest producer of milk in the world with dairying proving an important livelihood support for the rural poor in India. It is well acknowledged that suitable government polices and ‘Operation Flood’ programme are the chief contributor for the success in the dairy sector in the country. The favourable finance flow under various welfare and development schemes to take up dairy enterprises by the poor rural families has created

millions of livelihood across the country. The rapid urbanization in the country and overall economic development has resulted in growing demand for the milk and milk products in the country. The continuous technology development and extension services have added to the development of the dairy sector in the country. The milk production in the country has more than trebled to over 80 million tonnes between 1970-71 and 2000-01 with an average increase of about 4.5 per cent per annum, which in comparison to world's rate of about 1 per cent is much higher. During the period 2000 to 2006, the milk production increased by around 16% in India but Chhattisgarh was able to increase its milk production by less than 8% only. The profitability of dairy enterprises, to a large extent, is dependent on the efficiency of the marketing network.

Though the practice of swine husbandry exists in India for centuries, its contribution to the national economy is very meagre. The pig population of the country is 11.1 million as per the 2012-13 annual report of Animal Husbandry. Pork production in India is limited, representing only 7% 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 18th Livestock Census of India (2007), there was a marginal decline in total swine population. Swine rearing in India is carried out under variety of adverse social, climatic and environmental conditions. Piggery enterprises have remained underdeveloped mainly due to religious taboos and prejudices. Pig rearing in our country is mainly in the hands of socially economically weaker illiterate people from scheduled castes and schedule tribes. Their unscientific breeding practices and unhygienic management of pigs have also been a contributing factor which kept these Industries in primitive stage. These people often rear pigs in small groups and allow them to fend for themselves in open or free range system. The common village pig is a non-descript type scrub animal and has

no definite breed characteristics. This is maintained by poorer sections of the society who find difficulty in providing land for forage and capital constraint to buy concentrated feeds. To exploit this non-descript hogs for large amount of pork, during the last two decades, a great emphasis has been laid on the improvement of the productivity of pigs by implementing crossbreeding programme with exotic breeds of swine, to develop animals of large sized litter, efficient feed conversion, higher dressing percentage and better quality 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 are a small number of abattoirs in India which meet international standards. However, these facilities do not process pork. The pig farming constitute the livelihood of rural poor belonging to the lowest socio-economic strata and they have no means to undertake scientific pig farming with improved foundation stock, proper housing, feeding and management. Therefore, suitable schemes to popularize the scientific pig breeding cum rearing of meat producing animals with adequate financial provisions are necessary to modernize the Indian pig industry and to improve the productivity of small sized rural pig farms. In view of the importance of pig farming in terms of its contribution to rural poor and possible potentials for pig rearing in our country, Government of India has initiated measures to promote the pig farming on scientific lines under its five year plans. In order to make available good foundation stock 115 pig breeding farms were established throughout the country. Like any other farm animals, pigs are also susceptible to wide range of diseases of parasitic, bacterial and viral origin. The common important pig diseases are swine fever, swine pox, pig

influenza, anthrax, tuberculosis, foot and mouth disease, gastroenteritis, brucellosis, tapeworm infestation, skin diseases, worms and nutritional disorders etc., most of which are easily communicable among the farm animals and causes huge loss to the farm unless checked in time with immunization and other appropriate measures. The focus should be on control and eradication of Foot and Mouth disease and several other infectious and contagious diseases through compulsory vaccination and quarantine, backed by legislative measures.

The North-Eastern Region (NER) of India comprising the states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim occupies about seven per cent of total land area and four per cent of total population of the country. About fifty-seven per cent of the geographical area of NER is covered by forests, which are mostly under private or community ownership. Agriculture is the prime source of livelihood for the majority (85%) of rural population in this region. It is characterized by subsistence, low input-low output, technologically lagged mixed farming system, and is dominated by smallholders. Although cereals dominate the cropping pattern in this region, livestock are an important component of mixed farming system and dependence on livestock as an alternative source of income is significant. Further, because of social and religious acceptance, the consumption of meat is relatively higher in this region, and that of milk and milk products is lower. Coupled with the traditional meat-eating habit, increasing per capita income, urbanization and changes in life-style, the region is deficit in production of livestock products. Some states in the region depend on inter-state trade in livestock to meet the domestic demand. However, responding to the burgeoning demand for livestock products in a sustainable manner is a big challenge. The widening gap between the demand and supply of livestock products can be bridged by introducing changes in production structure or opening up international trade,

either of which can correct the imbalances in the long-run.

INFRASTRUCTURE AND SERVICES OF LIVESTOCK SECTOR IN NER :

(i) Feed and Fodder :

Adequate supply of feed and fodder is crucial to the growth of livestock sector. Livestock in India are fed largely on crop residues and by products and grazing lands. The same holds true for the NER too. Cultivated fodders and gathered grasses are two important sources of green fodder supply. About 2.5 per cent of the gross cropped area in the country is allocated to fodder crops but in the NER, farmers virtually do not allocate any land for fodder cultivation. Only 0.16 per cent of the gross cropped area has been estimated to be allocated for fodder cultivation. Therefore, the farmers largely depend on common grazing lands, i.e. permanent pastures and grazing lands, wastelands, fallows, excluding current fallows, etc. for fodder. However, these resources have been dwindling over time. The problem is further compounded by lack of availability of locally produced feed. The feed requirement in the NER is generally met through import from other states, which makes it costly and is often beyond the affordability of the farmers.

(ii) Veterinary Services :

Growth in production cannot be sustained unless livestock is protected against diseases. The veterinary infrastructure in NER is inadequate in terms of both quantity as well as quality. The NER accounted for 4.7 per cent and 8.8 per cent of country's veterinary dispensaries and veterinary-aid centres, respectively. However, it accounted for only 1.4 per cent of veterinary hospitals and polyclinics. In fact, the veterinary hospitals and polyclinics are the indicators of the availability of quality veterinary services. The inadequacy of infrastructure had resulted in less access of livestock farmers to

veterinary services. In NER, only about 22 per cent of the farmers could avail veterinary services, while at all India level 32 per cent of the farmers could use this service. A significant inter-state inequality was observed in the distribution of veterinary facilities across NE states and consequently, in the access of veterinary facilities by the farmers. Again, the available facilities were mainly used for curative purposes and very less attention was being paid for the prophylactic measures. In fact, the frequent spurt in the disease incidence is largely due to lack of emphasis on prophylactic measures. Therefore, a greater emphasis is needed on prophylactic control measures rather than curative measures. The prophylactic measures assume greater importance in view of emergence of exotic diseases like Avian Influenza, Mad Cow Disease, etc.

(iii) Marketing of Livestock Products :

The productivity of animal is very low in NER compared to other part of the country. While increasing farm-level production and productivity will require more improved animals, improved fodder/feed technology, and better access to livestock services, smallholders' access to reliable markets to absorb more milk at remunerative prices is also a critical constraint. Organized marketing of livestock in the NER remains relatively insignificant, despite efforts in the past to develop and promote collective market mechanisms. For instance, in Assam formal pasteurized milk and dairy product channels, both cooperative and private, could hardly account for 3 per cent of total locally produced marketed milk. The traditional market, for either fresh liquid milk or for traditional milk products such as sweets, thus accounted for about 97 per cent of the market opportunities for farmers. For smallholder producers in areas with poor market access, there are likely to be no alternative market options besides the traditional markets. It is thus apparent that developments in the traditional market will be very important.

(iv) Credit Facilities :

Credit flow in the NER is very low. The credit availability was `650/- per hectare of net sown area, which was much lower than the national average of `3450/ha. The lack of institutional credit is a severe constraint to development of livestock as the flow of credit to livestock is even worse than that of agriculture. While in the rest of the country, a significant proportion of agricultural credit is provided by co-operative institutions, in the NER, the co-operative structure is in a moribund state. Commercial banks and even RRBs are functioning mainly as deposit mobilization centres in the NER. Thus, situations compel the farmers to borrow from money lenders at an exorbitantly high rate of interest. A qualitative assessment of dairy in Assam has revealed that money lenders charge interest from 24 to 120 per cent per annum (CHD-ILRI-DDD, 2006).

It is observed that, over 50% of the total milk production in India consists of buffalo milk. As it has higher fat and total solids content, buffalo milk gives higher outturn of milk products than cow milk. However, due to some basic differences in its physico – chemical properties, the use of buffalo milk creates a few special problems during product manufacture and storage.

- **Compositional properties**:- Buffalo milk in general contains higher amounts of milk solids, viz; fat proteins, lactose, minerals, SNF/Solids-Not- Fat and TS/Total Solids than cow milk.
- **Physico-chemical differences**:-Buffalo milk normally has higher pH, acidity, buffer value, density, viscosity and fat gobule size. Different proportion of casein, whey protein, fatty acids milk fat and mineral salts etc.

The problems arising out of the compositional and Physico-chemical characteristics of buffalo milk can be solved by applying modified techniques. It is seen at most places that Dairy and piggery entrepreneurs are not aware of

the economics of the day to day business. This is because dairy and piggery enterprises has been a traditional form of business which is been carried on by generations together. It is commonly seen that most of the farmers who rear livestock animals for milk/ meat have very little or no idea about the expenses (per day) involved in raising the animals. It is interesting to know that the farmer is even unaware of the fact that the feeding cost of his animals comprises of more than 70% of the total cost of raising the animals. The main reason for this is because the farmer grows the majority of the fodder in his own land and has never bothered about its cost.

Nagaland is the 16th State in India with an area of 16579 Sq.Km. The state has 11 districts namely Kohima, Mokokchung, Tuensang, Wokha, Zunheboto, Phek, Mon, Dimapur, Kiphire, Peren and Longleng. The population according to 2011 census is 19.79 lakhs and the density of population per sq.km is 119 person. Sex ratio is 908 female per 1000 males with literary rate (percentage) of 79.55%.The people are mostly tribals having embraced the faith of Christianity which constitute almost 95%. The state official language is “English”. Agriculture is the main activity of the state which constitutes 72%. The state is bounded by Assam in the North-East, Arunachal Pradesh and Myanmar in the East and Manipur in the South. Nagaland which is situated in the North East of India is blessed with livestock resources of considerable genetic density with various species with traits adaptability to withstand the environmental stress and inadequate nutritional levels. Dairy and Piggery Enterprises play a significant role in the income generation of the Nagas particularly those in the rural sector. Many people meet their financial needs by selling them. However, looking at the present scenario, the existing livestock does not seem to suffice the increasing demand. The Government provide schemes to establish these farms, but corruption is rampant because of which, only a meagre portion is utilized for the same. Most of these farms are not Government sponsored but they are an individual’s effort. When we

look at the village level, we see almost every family rearing pigs but rearing cow is a rare phenomena. Even the poorest people rear pigs, but cows are usually reared by rich people. Pigs are reared both by rich and poor people but with two different reasons.

- Poor people rear pigs to sell meat, piglets and to meet their needs during festivals. The main source of income for the poor people is centered around this.
- Rich people rear pigs precisely for meat, some perhaps to supplement their income out of it.

Cows, as cited; are reared mostly by rich people. They are reared precisely for milk and meat. Cows have much potential in them but in the Naga context, only meat and milk are extracted out of them. They can be used for work in paddy fields , their dung as good manure, skins for leathers etc. Most people involved in dairy enterprise owns upto 10 cows, in some cases even more but very little are extracted out of them. These cows are rarely butchered unless some injury is inflicted upon and there is no hope for it to recuperate. The same cow does not give milk throughout the year and out of a herd, only few are capable of doing so. Those cows are neither trained to be used for work in the paddy field nor are supplied to be butchered. As long as this continue, it would mean Nagaland is not self sufficient. Cow rearers do not gain much in Nagaland. Besides they hire a caretaker exclusively to look after the cows. Even for pigs, Nagaland is still not self sufficient. Huge number of pigs are brought into Nagaland from central India via trains and unloaded at Dimapur, from where the pigs are supplied to other districts. Pigs are also brought in from neighbouring states to meet the high demand. In the existing system of farming, Indian farmers have exhibited unilateral preference to Crop Enterprise. Raising cash crops and producing grains occupy the foremost place in the present land use pattern of our farmers. Livestock into Enterprises are not treated by the farmers as Commercial

Enterprise and any product obtained is considered to be only incidental to the livestock production. This is because of low productivity of livestock which is attributed to poor genetic constitution and inadequate availability of nutrients. Besides, livestock diseases and parasites create serious problems to Livestock Enterprises and as such sizeable number of livestock are under nourished and poorly fed. Introduction of Dairy and Piggery Development Programme will lead to better utilization of land, water and human resources. Dairy and Piggery Enterprise are reckoned to be an instrument of social and economic change. The lack of appreciation by farmers who are traditionally crop-oriented to pursue animal agriculture on a large scale , the lack of capital and in most cases, incentives, have been included among the major setbacks in developing an economic –oriented Dairy and Piggery Enterprises. The Dairy and Piggery Enterprises may be considered in relation to its component segments viz, production, organization, processing and marketing. Animal husbandry is a tradition with the Nagas and therefore, rearing of domestic animal such as Cattle, Mithun, Pig and Poultry birds play a significant role in the socio-economic development of the Nagas. Thus, the great responsibility of Veterinary & A.H. Department lies with matters relating to Livestock and Poultry development, prevention of livestock diseases, Dairy Development, Feed & Fodder Development including livestock statistics of the state. In other words, the Veterinary & A.H. and Dairying sector also provides gainful self-employment opportunities to the ever-increasing Unemployment problems amongst the educated youths of the state to enable them to contribute family income. However, market access for smallholder livestock producers also remains a major constraint in many parts of India, especially in Nagaland State.

The geography and climatic condition of Nagaland is quite suitable for livestock rearing and for which rearing of livestock has been an integral part of Naga life from time immemorial and symbolic to the health and wealth of a

Naga family. The fact may be admitted that out of total Agricultural output value, the contribution of livestock sector during 1997 at current prices is accounted for 9.40 percent only-of the State Gross Domestic Products (GDP). But the local breeds are very small in size and their growth rate is also slow and has less productivity. These types of local pigs are not economical to keep. Pig breeding centers in the state of Nagaland under the schemes of NABARD are located at Akuluto, Medziphema, Merangkong, Phek, Sathazou, Tizit, Tuensang and Chewang society, Tening and Peren are involved in Piggery farming enterprises in Nagaland.

In order to accelerate livestock industry during the 10^{th} Five Year Plan, the focus of the department would be further intensified through appropriate techniques of breeding, feeding, health coverage and production oriented management programme in the coming years. Alternate sources of sustenance like Dairying and pig rearing plays a vital role in the country's agricultural economy, which is the second largest contributor to the gross agricultural produce. In the recent past, milk production has increased steadily due to the successful implementation of Operation Flood Programmes through combined efforts of research institutions, extension agencies, production and marketing networks, institutional credit policy and more importantly the enterprising, innovative nature of farmers practicing and operating dairy based farming systems. Dairy enterprise when combined with other enterprises on scientific lines offers great opportunities for increasing farm income and employment, particularly to the weaker sections of the rural community. Hence, the study of dairy based farming system is helpful to the farmers in rational economic decisions by selecting the appropriate combination of enterprises by reallocating their scarce resources efficiently (Komala,2002). The demand of meat is increasing year by year due to growth of population. The living standard of the people are also going up resulting in increased demand of meat year after year. But the production is not sufficient

to meet the growing demand due to low productivity of local breeds and to meet the situation, live stocks are imported from outside the State. This is one of the major expenditure which is affecting the State economy.

Animals are used for a variety of reasons, including meat, eggs and dairy production, as well as for draught power or future breeding. Significant changes are occurring in the composition of livestock production (live animals). Growth has gradually declined for cattle, from almost 2 percent per year in the 1960s to less than 1 percent per year over the last decade. Pig stocks have experienced an even more radical decline, from a growth rate of more than 4 percent per year 50 years ago to only 0.8 percent per year since 2000. Globally, livestock production is the largest user of agricultural land. On the negative side, there are environmental implications associated with the expansion of livestock production. For example, through the expansion of land for livestock development, sector growth has been a prime force in deforestation in Latin America and the Caribbean and in overgrazing in other regions. Intensive, large-scale livestock operations, mostly in the industrial countries but increasingly also in developing regions, are a major source of environmental problems through effluent production. In parallel, growth in the ruminant sector contributes to greenhouse gas concentrations in the atmosphere through methane emissions and nitrous oxide from the waste of grazing animals.

DAIRY AND PIGGERY DEVELOPMENT PROGRAMMES:

National Mission for Protein Supplements (NMPS) will be implemented in identified States during financial year 2012-13 under Rashtriya Krishi Vikas Yojana (RKVY), at an outlay of `500.00 (Rupees Five Hundred Crores only) of which, `200.00 Crores (Rupees Two Hundred Crores only) has been earmarked to the sub-scheme for dairy for Protein

Supplements (SPDD-NMPS). Under the scheme, projects will be funded for expansion of animal husbandry and dairy development activities with priority given to improving productivity of milch animals through measures such as productivity improvement programme, improving nutritional balance of animal feed concentrate, fodder development activity and improving milk procurement, processing and marketing infrastructure in the identified area of implementation.

The SPDD aims at ensuring nutritional balance for consumers in terms of milk protein intake, growth in milk production and holistic development of Animal Husbandry and Dairy sector.

The main objectives of the scheme are to:

- Increase milk production in the country.
- Ensure balancing of milk protein intake requirement and availability for the consumers.
- Incentivize the states so as to increase public investment in Animal Husbandry and Dairy sector.
- Provide flexibility and autonomy to states in the process of planning and executing projects for development of Animal Husbandry and Dairy sector.
- Ensure that the local needs/priorities are better addressed by the projects taken up by the respective state governments themselves.
- Achieve the goal of reducing the yield gaps in milk production, through focused interventions.
- Maximize returns to the milk producers/farmers in Animal Husbandry and Dairy sector.
- Bring about quantifiable changes in the production and productivity in Animal Husbandry and Dairy sector by addressing them in a holistic manner.

The SPDD is a part of National Mission for Protein Supplement under Rashtriya Krishi Vikas Yojana (RKVY). The eligibility for assistance under the scheme shall depend upon the States' milk production and present level of organized milk procurement with the view that maximum impact in terms of milk production could be generated after implementation of the projects approved under this Scheme. The scheme shall be implemented in 20 major milk producing specific district of the States of Uttar Pradesh, Rajasthan, Punjab, Haryana, Gujarat, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Bihar, Odisha, Paschim Banga, Madhya Pradesh, Jammu & Kashmir, Jharkhand, Uttarakhand, Himachal Pradesh, Chhattisgarh and Assam as identified by the State Government which has dairy potential for focussed and directed dairy development to achieve significant and measurable improvement in production and availability of milk and milk products. The entire schemes would be implemented under the RKVY umbrella with the flexibility of utilizing the funds in the prescribed manner. In addition, the State will be required to bear full cost of staff salary including any increase, maintenance of vehicle, office contingencies and acquisition of land etc. wherever necessary. State will ensure that the proposed Animal Husbandry & Dairy development activities under this scheme have convergence with the existing Animal Husbandry and Dairy sector schemes of Central and State plan, which shall also be taken into consideration while formulating Animal Husbandry and dairy development projects based on local needs.

Operational Process:

The quantum of assistance and the process of subsequent release of fund to the state will be in accordance with the approval given by State Level Sanctioning Committee (SLSC) on the basis of a Detailed Project Report (DPR) with definite time-lines, and clear objectives for Animal Husbandry and Dairy sector. An existing State Level Sanctioning Committee (SLSC)

headed by the Chief Secretary of the state will have the authority to sanction specific projects under the Scheme. The Government of India's representative shall participate in the SLSC meetings and the quorum shall not be complete without the presence of at least one official from the Government of India. The pattern of funding is 100% Central grant and the eventual goal is that the additional investment made through the SPDD scheme will lead to growth in milk production. The states are given sufficient flexibility under the scheme to make appropriate local choices so that the outcomes as envisaged in the Scheme objectives are met. Project Coordination and Implementation Committee (PCIC), at the State level may be set up which shall be responsible for ensuring that the scheme objective of growth in milk production is achieved in the State. PCIC shall be headed by Secretary (Dairy Development/AH/Cooperation). The committee shall have at least two members each from Dairy Development Department, AH Department and Cooperation Department and State Dairy Federation. The members in the (PCIC) shall not be below the rank of Joint Director. Four members shall complete the quorum.

Monitoring of the Scheme:

State Government through the functional Department (Dairy Development Department/Animal Husbandry Department/Cooperation Department) shall monitor the projects approved by SLSC under the Scheme. A system of collecting Quarterly Progress Reports (QPRs) for monitoring implementation of project activities under the scheme may be established. Quarterly/Annual progress reports indicating Parameters of monitoring in terms of physical and financial targets and achievements shall be furnished periodically in Performa, as prescribed by State Government and documented in the DPR. Details of beneficiaries and areas covered under the Scheme must be placed on the State Government/ Department web site, and should be monitored. Accounts of the implementing agency shall be subject to audit by

Chartered Accountants appointed by agency and/or by such other officers of Government of India/State/Union Territory Governments as required under rules and a report in this regard should be furnished/intimated to this Department. State Government shall also furnish fund utilization certificate at the completion of project activities.

Institutional Linkage:

State Animal Husbandry Department and Dairy Development Department along with State Dairy Federations shall jointly formulate the action plan under the directives of PCIC and identify areas where institutional linkages are to be established for ensuring achievement of SPDD objectives. States will be urged to ensure effective extension services and technical guidance in collaboration with ICAR/State Research Institutes. Similarly, involvement of Panchayati Raj Institutions (PRIs) should be explored to the extent feasible for effective implementation of Scheme.

Financial assistance in the form of yearly allocation shall be released to the State Governments for any/all of, but not limited to, the following components under the scheme.

Sl No	Components
1	Strengthening of dairy units by induction of upto 100 cross bred cows/indigenous descript milch cows like Sahiwal, Red Sindhi, Gir, Rathi etc/graded buffaloes
2	Rearing of Heifer calves- Crossbred, indigenous descript milk breeds of cattle and graded buffaloes (up to 50 animals)
3	Construction/renovation of cattle-sheds for housing of milch animals

4	Purchase/installation of milking machine, milk-o-tester, bulk milk cooling units
5	Establishment/modernization/augmentation of processing capacity of dairy plants
6	Purchase of equipments for Fodder cultivation, harvesting, silage making, fodder block making unit, feed mixing and grinding facilities, and for manufacturing feed and feed supplements.

The State Government Departments, State Government owned Undertaking/Board/Authorities would be given 100 % grant for undertaking the mentioned activities. The projects implemented through Dairy/Milk Cooperative Societies would be on 75:25 cost sharing basis between Central grant and Implementing agency's share. In case of the project being implemented by a progressive dairy farmer the assistance from the scheme should be limited to 25% of the project cost. Funding pattern shall continue to be on 50:50 cost sharing basis for the project components, which have already been approved under the scheme during 2011-12 and which are implemented through Dairy/Milk Cooperative Societies.

A budget provision of `200.00 Crores has been made for the financial year 2012-13 under the scheme. A List of 20 high milk producing states, which are eligible for receiving assistance are given as under:

Sl.No	States	Proposed State-wise allocation during 2012-13
1	Andhra Pradesh	13.41
2	Bihar	10.14
3	Gujarat	15.44
4	Haryana	9.75
5	Karnataka	10.35
6	Kerala	7.52
7	Madhya Pradesh	10.73
8	Maharashtra	12.17

9	Odisha	6.73
10	Punjab	12.17
11	Rajasthan	14.91
12	Tamil Nadu	10.70
13	Uttar Pradesh	19.43
14	Paschim Banga	8.55
15	Jammu & Kashmir	6.57
16	Jharkhand	6.53
17	Uttarakhand	6.45
18	Himachal Pradesh	6.24
19	Chhattisgarh	6.19
20	Assam	6.02
TOTAL		200

Notwithstanding the guidelines for implementation of NMPS during 2012-13, the State Governments may take up any innovative project suitable for local conditions, to effectively demonstrate the improved technology and practice for improving productivity and production in the sector. However, at least 15 days prior to consideration of such projects by the State Level Sanctioning Committee (SLSC), a copy of such innovative projects may be sent to the Department of Animal Husbandry, Dairying and Fisheries for comments, which may be placed before SLSC along with the projects for consideration'.

The Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India will implement a National Mission for Protein Supplements (NMPS) in identified states (Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Uttar Pradesh and Paschim Banga) during financial year 2012-13, to implement pig component of NMPS with an allocation of `40.00 crores has been earmarked to encourage meat production from piggery.

Promoting availability of high grade crossbred piglets through pig breeding and multiplication units with the following permitted activities:

- Establishment/ strengthening of 16 Pig Breeding Nucleus Units in 16 selected states with proven potential.
- Nucleus centre will have 0-18 Satellite Field Breeding Units.
- Each nucleus centre will produce 5,000 breeding piglets per year for distribution to the satellite units and other farmers for breeding purposes.
- Piglets produced at satellite Field Breeding Units will be fattened for meat either at these centres or at the units of other beneficiaries.

The challenges faced by our country in securing the food as well as nutritional security to fast growing population need an integrated approach in livestock farming. Among the various livestock species, piggery is the most potential source for meat production and pigs are more efficient feed converters after the broiler. Apart from providing meat, it is also a source of bristles and manure. Pig farming will provide employment opportunities to seasonally employed rural farmers and provide supplementary income to improve their living standards. The advantages of pig farming are:

- Pig has got highest feed conversion efficiency i.e. they produce more live weight gain from a given weight of feed than any other class of meat producing animals except broilers.
- Pig can utilize wide variety of feed stuffs viz. grains, forages, damaged feeds and garbage and convert them into valuable nutritious meat. However, feeding of damaged grains, garbage and other unbalanced rations may result in lower feed efficiency.
- They are prolific with shorter generation interval. A sow can be bred as early as 8-9 months of age and can farrow twice in a year. They produce 6-12 piglets in each farrowing.
- Pig farming requires small investment on buildings and equipment.

- Pigs are known for their meat yield, which in terms of dressing percentage ranges from 65 - 80 in comparison to other livestock species whose dressing yields may not exceed 65%.
- Pork is most 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.
- Pigs manure is widely 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.
- Pig farming provides quick returns since the marketable weight of fatteners can be achieved with in a period of 6-8 months.
- There is good demand from domestic as well as export market for pig products such as pork.

Though an increasing trend of pork production is observed in the state, it is not sufficient to meet the actual requirement of the state and thus a large portion of the state's requirement is procured from neighbouring states such as Assam. Pig production is highly influenced by the size of the farm. The establishment of large Government and Institutional farms should therefore be supplemented with an active programme to stimulate the small farmers to accept Dairy and Piggery Enterprises as part of rural activities. Unless efforts are concentrated to appeal to the human element involved in the process of change, handling of Dairy and Piggery production in large modernized units can only be a partial answer to the problem.

Therefore, there is an urgent need to examine the problem and prospects of Dairy and Piggery Enterprises of Nagaland towards Economic Development of the State. Enough research establishes the truth and suggest measures thereof to deal with the problem. It is with this background that the present piece of research is conceptualized and taken up. This study will be helpful to

the State itself for taking necessary steps and remedial measures for successful performance of Dairy and Piggery Enterprises of Nagaland towards overall development. It is our endeavour to study "The performance of Dairy and Piggery Enterprises and their impact on Rural Economy of Nagaland". So it is hoped that this study will be of immense importance for all the concerns.

NEEDS AND SIGNIFICANCE OF THE STUDY:

In terms of Economic importance, next to Agriculture, the segment of activities allied to Agriculture has been playing a vital role in our State. Dairy and Piggery Enterprises are also one of the important segments of it. In fact, Agricultural activities and Rural/Cottage Industries are mutually interdependent on each other. Besides, following considerations have signified the need for paying undivided attention to the growth of this segment as an integral part of our economic development.

- It provides subsidiary occupations to the small and marginal farmers in particular and entire farming community in general.
- It improves nutritional standards of not only those who profess these activities but also the general population of the Country through consumption of meat, milk etc.
- With little training and improving skill of rural youth and women, these activities often provide net profit much more than what is accruable from Agriculture.
- It creates sizeable employment in Rural Areas itself, increases income and thereby purchases power for poor Rural families, maintain ecological balance, minimize energy problem and bring about balanced economic development.

- Particularly landless labourers, wage earners secure self employment opportunities either full time or part time in this area.

One of the important factors responsible for placing so much emphasis on Dairying and Piggery as a measure to improve the conditions of the Rural poor or to use this as one of the safeguards against accentuation of inter-class disparities in Rural Areas is the impression that Dairy and Piggery fits with the farm level infrastructure of the small farmer. Dairy and Piggery Enterprises, if practiced on scientific and commercial lines could often gain employment to Rural folk, especially women. A constant and regular flow of income from milk to meat and leather production throughout the year is welcomed by the households. Dairy and Piggery production by the small farmers as an adjunct to primary crop agriculture is more likely to increase living standard of our State. Pig production is essential for future development of Indian meat industry. Pig is one of the most efficient food converters among domesticated animals. It is a litter bearing animal among the meat producing livestock having shortest gestation interval and high feed conversion efficiency. It converts kitchen waste, feed items not edible by people into product of high quality diets for human beings. Despite the fact that swine rearing is a profitable enterprise, most of the progressive farmers even today hesitate to adopt it due to prejudice sentiments in our society against pig farming. For many others there is religious taboo against pig. A majority of meat eaters also do not consume pork. In spite of these drawbacks, the consumption of pigs has greatly increased in recent years due to nutritional awareness in people. Pig is a highly prolific breeder and a cheap source of protein. Pork as a source of animal protein is gaining popularity in India and pork products will be in greater demands in years to come.

The carcass yield of pigs has been known to be highest among food animals. The high carcass yield would attract the farming community because of the better monetary returns within the shortest possible time. High fertility

in pigs gives an assured income to the rearer round the year. Improvement in the pork quality apart from increasing pork yield would make the pigs more economical to rear. To bring about improvement in the productivity of pork and other piggery products, extensive crossbreeding programme has been taken up to develop animals of large size, better feed conversion efficiency, high dressing percentage and quality pork. Consequently, a number of piggeries have come up where hogs are being raised on scientific lines and manufacture of piggery products is carried out under modern conditions. Such a programme if encouraged would help in controlling the rising prices of mutton etc. It is hoped that swine development will go a long way in solving protein hunger prevailing in our country. Pig production is basically an enterprise of converting inedible or low quality food to the food rich in animal protein. Pig converts grain, pasture, inedible materials and other feeds into pork/meat used as human food. Pigs serve best as salvagers of by- products, surpluses and such refuse that occur in production, processing and consumption of many kinds of foods. A small unit of 10 piglets when reared for fattening will weigh about 600 to 800 kg. at marketable age and will fetch a sizeable profit, if a market is already created. Creating a market in advance is essential for selling pork products. It is lack of market that makes this industry a failure. Pork holds a major part of the meat consumed in Nagaland and Government should therefore take proper initiative for pork production. In large number of places, this industry thrives well. It can function as a cottage industry engaging a large section of people. Piggery enterprises will promote self sufficiency of the small and marginal farmers especially in backward areas and is highly applicable in a state like Nagaland.

Dairying is closely interwoven with the socio-economic fabric of rural people. Milk is a complete food as it can supply all nutrition essential for life. Milk and milk products is rated as one of the most promising sectors which deserves appreciation in a big way. Moreover, milk is a cash crop for

smallholders, converting low value agriculture byproducts and crop residues and using family labour as a value-added market commodity. Although there has been a fast expansion of the organized sector, the traditional sector comprising of private traders/farmers has continued to be a major supplier of milk and pork meat to the urban markets of Nagaland. Besides the opportunity of fast growing market demand for milk and meat, the private unorganized sector offers better quality at competitive prices to the local consumers than the organized sector which includes produce procurement mostly from other states. The demand for milk products and meat from the dairy and piggery sector is projected to well overrun supply in Nagaland and the country in general. A sustained effort at enhancement of milk and meat production must precede any other measures. Dairy and piggery development for sustainable livelihood in view of the demand supply gap should be taken as top priority for the economic development of the state.

REVIEW OF LITERATURE:

The performance of Dairy and Piggery Enterprises and their impact on rural economy, is a very important subject of Social Sciences. As such, it has been a popular subject among the researchers and student community at National and International level of study in all the Universities of the Country as a whole. In most of the developing economies, Dairy and Piggery Enterprises play a vital role for the middle class people of any state, particularly for rural India. Various studies have been made from time to time to look into the different aspects of dairy and Piggery Enterprises towards socio – economic development of the states in particular and the nation in general. A review of literature pertaining to these studies are given below :

- Mahanta, K.C – “Handbook of Animal Husbandry” - The object of this book is to give a clear understanding of all available information for the improvement of Livestock farming. According to this book, K. C Mahanta stress more on Animal Husbandry as a form of business. He said that the practical results of this would give immediate profits. Most Animal Husbandry problems arises from practical and economic considerations. Sentimental Animal Husbandry man must be ready to cull and eliminate rigorously all the unprofitable livestock and his only considerations should be better livestock, greater yield and more profit.

- Sastry, N.C.R. & Thomas, C.K. – “Livestock Production management” – This book deals with the livestock management which involves the integrated application of the principles of animal breeding, feeding, housing, organisation and disease control in a manner suitable for a particular situation. An effort has also been made to throw light on the basic principles and discuss the applied aspects of the same. Management of livestock involves doing a large number of small jobs at the proper time and in a proper manner.

- Singh, R.D.N. & Zeliang, T. – “Development profile of Animal Husbandry in Nagaland” – The main core of this book is the thrust of activities in Animal Husbandry which should be on the promotion of technologies relating to utilization of available livestock resources within the State ie, Nagaland for the generation of productive employment and to increase productivity to bridge the gap between demand and availability of nutritional status of the people. In addition to a proper mix of intellectuality and technology, another factor which is essential for excellence is a constant flow of knowledge and expertise to the rural people in order to increase production of livestock products

for improvement in the nutritional status of the people. They gave a strong opinion to use the available resources optimally, maximize the result of the efforts put in by the farmers and safeguard the interest of the rural people.

- Prasad, Jagdish – "Goat, Sheep and Pig – Production and Management" – In this book, attempt has been made to prepare the manuscript on goats, sheep and pig production and management which includes basic principles of their husbandry regarding present status, statistics, breeds and breeding, feeding, care and management, health and hygiene, their productions and economics of farming of different size units with relevant references and questions.

- Etgen, William M. and Reaves, Paul M.. Sixth Edition – "Dairy Cattle Feeding and Management"- This book endeavors to keep pace with the many rapid changes in dairy industries with added materials on business management and labor efficiency. Their research results in practically every branch of the dairy industry have made the work with dairy cattle and milk production a science as well as an art. They have applied the basic principles of nutrition, genetics, physiology, engineering and business to the management of the feeding, breeding and handling of dairy cows and managing the dairy farm business which are being used to improve the efficiency of the dairy industry.

- De, Sukumar. – " Outlines of Dairy Technology" – This book contains the salient aspect of the processing and manufacture of various types of milks, milk products and scientific information viz, market milk, special milk, cream, butter, butte roil, ice cream, cheese, condensed

milk, dried milk, dried milk products, Indian dairy products and dairy by products.

- Gopalakrishnan, C.A. and Lal, G. Morley Mohan. –“ Livestock and Poultry Enterprises for Rural Development”- The aim of this book is to present a succinct account of the basic principles involved in livestock and poultry production besides presenting financial schemes in livestock and poultry enterprises for the ‘Weaker Sections’ of the society in a simple and practical manner. The organization of this book consists of all the livestock and poultry production as rural enterprises in eight parts viz, dairy, cattle, buffalo, goat, pig, sheep, poultry including details of fodder and gobar gas production. Breeding management contains the datas on production performances and norms of economic traits in livestock observed in our Country and feeding management includes feeding practices in dairy cattle, buffaloes, goat, sheep, pig and poultry with details of suggested locations.

- Chanty, K.T. Indian Social Institute – “ Agricultural Education on Swine Production”- In this book, an attempt is made to reach out the highly advanced techniques of swine production to the common people at the village level. This book includes the briefly surveys of the state of swine production in India, space requirement per head in each class is given, common nutrients required for the growth and development, providing detailed management practices of various categories of swine and giving the detail records one should maintain for profitable swine rearing.

- Singh, Shyam Kishore. - “Dairy farming” – According to this book, large scale dairy farming is only viable where either a large amount of

milk is required for production of more durable dairy products such as cheese, or there is a substantial market of people with cash to buy milk, but no cows of their own. Modern dairy farmers use milking machines and sophisticated plumbing systems to harvest and store the milk from the cows, which are usually milked two or three times daily. Many modern facilities and particularly those in tropical areas ,keep all animals inside at all times to facilitate herd management. The major topics dealt in this book are; introduction to dairy farming, Animal Husbandry and milk consumption, dairy cattle, dairy products and milk allergy, amul milk, domestic goat, domestic sheep and economic importance, food and drug administration, bovine somatotropin, family farm and dairy farming and organic farming, dairy farming in India.

- Tomar, S. S. – "Textbook of Animal Breeding" – The main feature of this book is about Animal breeding covering domestication, conservation, livestock contribution, data collection and adjustment, prediction and measurement of response, selection, different selection criteria, selection experiments, mating systems, breed improvement programmes and the breeding strategies for different species of livestock and poultry.

- McGlone, John, Pond, Wilson G. – "Pig Production: Biological principles and Applications" - This book covers the basics in pig biology from genetics, reproduction, nutrition and growth, to timely and current discussions on human resource management and social farming issues. It combines knowledge of biological studies with opportunities for getting practical experience in the pig production business. Unlike other texts, this book leads readers to understand the techniques involved in pig production rapid growth and industry

successes and provide manager of small family farms or corporate establishment with an invaluable resource for applying these strategies and methodologists to boost business and production efficiencies. It is an unparallel source for the basics and beyond in modern pig production.

- Kellaway, R and Harrington, T. - “Feeding concentrates: Supplements for dairy cows” - This book presents strategies for feeding energy and protein supplements to pasture-fed dairy cows and examines the potential economic benefits. It focuses on feeding concentrates to pasture fed cows to achieve high milk production per cow per hectare and will assist farmers to decide which supplements gives the best results in their particular situation. The book thoroughly reviewed the issues and clearly documents the research particularly for grains supplementation. It will be particularly helpful to the dairy farmers in making best management decisions relating to food concentrates.

- Dietrich, William. - “Swine - Breeding, feeding and management”- This book looks at all aspects of rearing pigs in quite a modern and informed way. This was one of the first books to really use and report on the results and conclusions of trials done by the Experimental research stations that were being set up to improve pork production in the USA at the time. Many, if not most of the key messages are certainly applicable today. The book covers all aspects of pig farming and also the general principles involved.

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- Rao. P. Venkateshwara - “ Dairy Farm Business management” - This text aims to acquaint dairy farmers with the most essential and relevant principles of the science of dairy management, taking care to

thoroughly entrench them in the basic concepts, practices and techniques which give shape to the modern process of the science. In addition to delineating the current trends and developments in the dairy field, the text takes care to elaborate upon the whole industry, its revenues, prospects and challenges with due consideration to the rapidly globalising dairy sector itself. Further critical perspectives have been incorporated, which provides fresh insights into the ways in which the dairy management is rapidly assuming new dimensions.

- Moran, John. – "Business Management for Tropical dairy farmers" - According to this book, most countries in South-East Asia have established small holder dairy farming industries through social welfare and rural development programs to provide a regular ash flow for poorly resourced farmers. These farms are now being accepted as rural industries and require a more business-minded approach based on changes to farm profitably. Business Management for Tropical dairy farmers gives small holder dairy farmers the business management skills they will need to remain sustainable.

- Choi, Euiso. – "Piggery waste management" - This book identifies and characterises the key issues involved in the management of piggery waste and provides recommendations on sustainable treatment regimes. All the technologies available for the treatment of piggery waste are reviewed, including conventional and emerging technologies from composting and anaerobic digestion to nitrate nitrification and de-nitrification. Examples of integrated systems are presented. This work will be an invaluable source of information for all those concerned with research and practice of animal waste treatment that includes livestock farming.

- Klober, Kelly. – “Storey’s guide to RAISING PIGS” - This book provides all the information a small scale pig farmer needs, the comprehensive guide covers breed selection, housing, humane handling, butchering, disease management and more. Stressing the importance of sustainable and environmental friendly farming practices. The author provides expert tips on making pig farming operation more efficient and profitable. This book will give beginners the confidence they need to succeed, while inspiring experienced farmers to try new techniques and experiment with new breeds.

All the above books, were helpful in getting broad ideas on the structure of dairy and piggery farms. It gave me an overall perspective on the required inputs and factors of management and administration of dairy and piggery farms all over the world. It also assisted me to be informed about the common problems, prospects and the steps that needs to be implemented for productive animal husbandry.

OBJECTIVES OF THE STUDY:

In view of the above, the study is undertaken with the following objectives.

- To ascertain the existing scenario of Dairy and Piggery Enterprises of Nagaland.

- To evaluate the supply chain of various inputs to the Dairy and Piggery Enterprises and marketing channel of distribution of Dairy and Piggery Farm outputs.

- To evaluate the performance of Dairy and Piggery Enterprises for the Economic Development of the State. (A comparative study with the neighbouring state of Meghalaya).

- To study the prospects of Dairy and Piggery Enterprises as a full time / part time occupation for the people of the State.

- To analyze the various obstacles in production and marketing of Dairy and Piggery products and to suggest measures for the better gainful result of the Farms.

HYPOTHESIS:

It is proposed to test the following hypothesis :

- Both Dairy & Piggery Enterprises are economically viable for the state which can offer gainful employment.
- Performance of Dairy & Piggery Enterprises of the State are not encouraging.
- Efficient marketing channel of distribution of Dairy and Piggery Enterprises will be helpful to generate income of the rural people in the State.

RESEARCH METHODOLOGY :

The method of the study is an empirically inductive one. The analysis is done both in qualitative and quantitative approach. The study is based on both primary as well as secondary data. The secondary data were collected from Dairy and Piggery development activities of Nagaland Government covering

all the district offices, Directorates of the Veterinary and Animal Husbandry Departments, Enterprises etc.

The primary data has been collected with the help of field visits, scheduled interviews, personal interviews and discussion with the State Government Officials as well as private Entrepreneurs. The questionnaire was divided into four parts to collect data and information viz;

a. Response to comprehensive questions.
b. Complaints if any.
c. Suggestion if any.
d. Personal information.

In the questionnaire, questions were given to measure the attitude of the concerned people and implementing authority towards Dairy and Piggery development of the state.

However, the secondary data and information were also collected with the help of the following :

a. Government reports and publications.
b. Published Journals, periodicals, books, magazines and Newspapers.
c. Publications and Research Articles.
d. Published datas, information literature and materials from the Veterinary and Animal Husbandry Department of Nagaland.

RESEARCH DESIGN :

It is clear from the objectives, that the information required for the project is specific. The project attempts to obtain a comprehensive description and analysis of the performance of Dairy and Piggery Enterprises and their impact on the development of rural economy of the state of Nagaland. The study, therefore, be designed to prove from the collection of all necessary information keeping the above specification in mind. The research design

adopted here is explanatory in nature. Basically, while designing the questionnaire, it is kept in mind that all the required information is being collected.

A pilot survey has been conducted for Dairy and Piggery Enterprises in all the eleven Districts of Nagaland with the help of random sampling. Discussions have also been held separately with the State Government officials, entrepreneurs and common people. During the period of the study, the following tools were used;

- Trend Analysis.
- Ratio Analysis.
- Central Tendency (Average Analysis).
- Comparative Analysis.
- Percentages.

The study covered the period till 2014 -2015. It is also ensured that, the questionnaire do not become too much lengthy and bore some for the respondent to answer. The study is completely based on empirical approach. Data (both primary and secondary) so collected are analyzed and interpreted to draw the inferences.

PERIODICITY AND AREA OF OPERATION :

The study, in general, encompasses the year periods commencing from 2005-06 to 2014-15 subject to availability of data and information. Where, however, data and information for period subsequent to 2005-06 are available or required, they will be provided at appropriate places. It is primarily, an attempt to better analyze the performance pattern, impact and economics of Dairy and Piggery Enterprises in Nagaland comprising of all the 11 districts.

PLAN OF THE STUDY AND CHAPTERISATION:

The plan of the study is based on the following tentative chapters :

Chapter I : Introduction:

-Needs and significance of the study.

-Review of Literature.

-Objectives of the study.

-Hypothesis.

-Research Methodology.

-Research Design.

-Periodicity of the study.

-Plan of the study & Chapterisation.

-Limitation of the study.

Chapter II : Existing Scenario of Dairy & Piggery Enterprises of the State of Nagaland.

Chapter III : Supply chain of inputs to the Dairy & Piggery Enterprises and marketing channel of distribution of farms outputs of the State.

Chapter IV : Role of Dairy and Piggery Enterprises and their impact on Rural Economy of Nagaland. (A comparative study with a neighbouring State like Meghalaya.)

Chapter V : Income and Cost benefit analysis of Dairy and Piggery Enterprises.

Chapter VI : Problems of Dairy & Piggery Enterprises and their prospects.

Chapter VII : Summary of findings, recommendations and conclusion.

LIMITATION OF THE STUDY:

The Dairy and Piggery enterprises of Nagaland is at its infancy and at the moment highly unorganized and lack sufficient data for reference. Both these enterprises are dominated by the domestic/private traders/farmers who use dairying and piggery as a form of additional sustenance and does not depend on it for primary source of livelihood, therefore giving these enterprises less importance/attention/labour/dedication. These enterprises being secondary, do not enjoy the documented value of the primary and as in most similar cases, the farmers fail to keep strict accounts of expenditures and income. This has been a problem/hindrance in obtaining information. At present, there is little or no routine ante and post mortem slaughter meat in areas where significant number of meat are slaughtered and sold. Most of the data in this thesis is based on recounts of farmers of their personal accounts, mostly through memory and information passed orally/through word of mouth without any hard backed/ concrete recorded database and therefore not exactly something proved, and in some cases can be taken as disputable theories.

However, due to various factors, the production potential of our livestock is not upto the desired level. A principle factor is that Planned Development Programme could be stated from Fourth Five Year Plan (1969-74) only to meet the challenges of deficit and to produce more to attain self-sufficiency in respect of meat, milk, eggs, etc. Special emphasis is being laid on project and programmes for enhancing the production of various livestock through genetic improvement, effective health cover and better management in both Urban and Rural Areas. As a result of continued efforts, the per capita annum availability of milk in our state is 42.58 kgs, Meat 16.77 kgs. It has now become evident that livestock production is one of the dominant sectors of our State’s economy and therefore the study will be helpful for the

economic upliftment of the people in this Backward State of the North Eastern Region.

Thus to conclude, it is clear that Dairy and Piggery Enterprises is not popular in the State. In this paper, status of the dairy and piggery is not sound. Special emphasis is being laid on project and programmes for enhancing the production of various livestock through genetic improvement, effective healthcare coverage and better management in both Urban and Rural Areas. Therefore, there is an urgent need to examine the problem and prospects of Dairy and Piggery Enterprises of Nagaland towards Economic Development of the State. This study will be helpful to the State itself for taking necessary steps and remedial measures for successful performance of Dairy and Piggery Enterprises of Nagaland towards overall development. However, introduction of Dairy and Piggery Development Programmes will lead to better utilization of land, water and human resources. Dairy and Piggery farming has a very large untapped potential for both improving economy and creating employment opportunities in rural areas and can well be a significant way forward to salvage dignity of labour, self-reliance and has the potential to create productive enterprises generation for a sizeable population in the state.

CHAPTER : II

EXISTING SCENARIO OF DAIRY AND PIGGERY ENTERPRISES IN NAGALAND.

Dairy and piggery entrepreneurship in Nagaland is in its infancy and at present, there are very few Nagas who has taken up dairying and rearing of pigs on a large scale or as a primary occupation. According to 2011 census 75% of Nagas still live in rural areas. Rural people of Nagaland are traditionally crop-oriented and are hesitant to pursue animal farming on a large scale. Agriculture is the most important activity of the people and about 68 per cent of the total state's population depends on rural cultivation. The state does not produce enough food, and depends on trade of food from other states of India which includes meat and dairy products. Animal husbandry is a tradition with the Nagas and therefore, rearing of livestock are inherent to the societal structure of the Nagas. Animals are used for a variety of reasons, including meat, eggs and dairy production, as well as for draught power or future breeding. Climatic condition of a place, social acceptance of pig and animal products and scientific updated knowledge of the farmer influences dairying and piggery farming to a great extent. So, in starting up a Dairy or piggery farm these practical and important factors should be kept in mind. In Nagaland due to suitable climate and availability of open spaces; rural piggery, poultry and dairy are taken up in the form of backyard farming in rural areas. Animal husbandry in the Naga context is generally looked upon as a secondary occupation or as secondary value added economic activity. The Gross State Domestic Product (GSDP) of Nagaland at current price was `1385934 lakhs in 2011-12. Nagaland's GSDP grew at about 9.9% compounded annually for a decade, thus more than doubling the per capita income but huge amount of yearly deficit budgeting with over `1,426 crores deficit budget for the 2015-16 fiscal adds to the state's economic backwardness, lack of development, and slow economic growth. The state’s internal monetary value in terms of internal production of meat, milk and egg is `637.71 crores, which contributed around 20 per cent to the state’s revenue earning. Nevertheless, agriculture and forestry contribute majority of

Nagaland's Gross Domestic Product. According to 2013-14 state department data, Nagaland imports `148.94 crores worth of pork and milk (powder milk and baby food) worth `62.36 crores. Nagaland also imports cattle and buffaloes from Myanmar and other states of the country.

With the establishment of the Nagaland Directorate of Veterinary & Animal Husbandry in 1965, the state has started commendable schemes and projects to improve the animal husbandry sector specially dairy and piggery enterprises. The Indian Council of Agricultural Research (ICAR) is promoting the breeding of superior pig germplasm through artificial insemination with aims to employ artificial insemination to hopefully transform Nagaland state from a pig-importer to self sustainable in pork production by 2020. A training program was organized recently under the 'Mega Seed Project on Pig' in the ICAR complex for NEH(North Eastern Hill) region, Nagaland Centre in Jharnapani under Medziphema in Dimapur. The event was held in collaboration with the Nagaland Pig Farmers' Association and Confederation of Naga Farmers' Union. Regulation of veterinary services was started with the establishment of Nagaland Veterinary Council in 1998. NABARD has started various schemes and sensitization programmes for the farmers. Albeit all these positive developments to promote piggery development and related activities, effective execution, completion and implementation of the schemes are rarely seen and the diverse administrative and managemental issues in the state prevents the benefits from reaching the actual beneficiaries. The slow growth of the dairy and piggery sector may also be attributed to the improper implementation of schemes by the departments/organizations and the skeptical undertakings of the said schemes and projects by the beneficiaries. The state imports about `200 crores worth of meat annually but officials of the veterinary and animal husbandry department are hopeful that this would come down drastically as all efforts are being made to increase meat production. The department would

soon sign a Memorandum of Understanding (MoU) with the German company, "Pig Dutchman", to start modern slaughtering houses and pig-breeding farms in the state through Public Private Partnership (PPP).

Although, milk is not a staple food for the traditional Nagas, milk production has recorded a growth rate of average 8.5% per annum in the last few decades. Milk Culture is becoming a rising phenomenon amongst the Nagas with the introduction of KOMUL (now DIMUL and MILKCON) milk and milk products in the state. The Nagaland State Dairy Co-Operative Federation Ltd. was set up as an apex body for Dairy Development in 2002 with the mandate to replicate the apparent success story of the famous "Anand Pattern" Co-operative dairying in the state of Nagaland. The basic design of the Anand Pattern evolved from AMUL, Gujarat comprises of three-tier system viz; State level Federation, districts head quarters to facilitate milk procurement and Marketing Avenue for dairy farmers. Nagaland has been featured in the Dairy Map of India largely through the implementation of Centrally Sponsored Scheme of Integrated Dairy Development Project (IDDP) which included the project designed to establish Bulk Milk Cooler Units (BMCU's) in selected milk shed areas on 100% grant basis managed by dairy cooperative societies. During the 8th Plan period, the Government of India sanctioned an IDDP under non- operation flood areas, hilly and backward areas for setting up of a 10000 litres per day capacity Dairy Plant and to organize dairy co-operative Societies. The project was successfully implemented and was functioning under the umbrella of Dimapur District Co-operative Milk Producers' union Ltd. (DIMUL). On successful implementation of the 1st phase IDDP, the Government of India has sanctioned further projects of IDDP. Accordingly, the Dairy Federation has set up Milk Chilling Plants, Bulk Milk Coolers in various district Headquarters. Of late, a new State-of the art Dairy Processing Plant in the name and style of Capital Dairy has been set up and commissioned on 3rd

June 2013. The new Dairy is equipped with Ultra High Temperature (UHT) and Aseptic Packaging Unit, the first of its kind in the whole of East Zone and Northeast Region, to produce long shelf life toned milk. Besides, the Dairy also produce Lassi, yoghurt and paneer under the brand MILKCON. The UHT plant was however, discontinued within a short period of production, citing technical problem.

The Nagaland Quinquennial Livestock Census indicates that there was general rise in growth rate of livestock till 2007 with sharp decline from 2002-12. The state is unable to meet the increasing requirement of meat and milk products and due to high demand and shortfall, the state ends up importing the difference in demand and supply from out of state thus having adverse effect on the economy of the state. Development of dairy and piggery enterprises is a rising phenomenon amongst the Nagas although it has not been highly commercialized yet and needs much emphasis on measures of improvement in its management, organizational structures, processing and marketing to make it economically viable for the state. The data represented in the following table gives clear picture about the status of Cattle, Buffaloes and Pigs in the state of Nagaland.

Table 2.1: Quinquennial Livestock Census.

Sl. No.	**SPECIES**	**15TH LIVESTOCK CENSUS, 1992**	**16TH LIVESTOCK CENSUS, 1997**	**17TH LIVESTOCK CENSUS, 2003**	**18TH LIVESTOCK CENSUS, 2007**	**19TH LIVESTOCK CENSUS, 2012**
1.	CATTLE	330661	383308	451017	469768	227293
2.	BUFFALO	34397	36131	33757	33920	31451
3.	PIG	526201	571176	644214	697790	491087

Sources: Department of Veterinary and Animal Husbandry, Government of Nagaland.

The following observation can be made from the data represented in Table 2.1:

- The State could achieve 15.9% growth rate of cattle from 1992 to 1997, 17.7% growth from 1997 to 2003 which is encouraging, growth rate from 2003 to 2007 was only 4.2% and a huge decline of 51.6% from 2007 to 2012 which is very discouraging.
- The State achieved 5.04% growth rate of buffalo in 1992-1997 followed by a decline of 6.6% from 1997-2003, a slight increase of 0.4% in 2003-2007 with further decrease of 7.3% in the period 2007-2012
- Growth rate of pig from 1992 to 1997 is 8.5%, 12.8% from 1997 to 2003, 8.3% from 2003 to 2007 and a decline of 29.6% from 2007 to 2012.

This overall decline in the population of cattle, buffaloes, goats and pigs is because of the skeptical approach and lack of appreciation by farmers who are traditionally crop-oriented to pursue animal farming on a large scale and holding on to the traditional concept of animal farming being a secondary added occupation. The other reasons are, migration from villages to towns and cities in search of better income/livelihood and the implementation of total sanitation campaign (GOI 1999) in Nagaland, which included prohibition of free-range livestock rearing in almost all the villages and made animal housing compulsory. The estimated milk and meat production during the period of 2005 - 2006 to 2014 -2015 of the state of Nagaland is given in Table 2.2.

Table 2.2: Estimated Milk and Pig Meat Production during the Last 10 Years.

Year	Milk (‘000 M.T)	Pig Meat(‘000 M. T)
2005-06	64.60	-
2006-07	67.00	-
2007-08	70.00	20.42
2008-09	74.67	29.27
2009-10	77.80	24.94
2010-11	77.84	24.87
2011-12	78.15	32.00
2012-13	78.35	50.36
2013-14	79.54	-
2014-15(Anticipated Achievement)	81.92	-

Sources: Department of Veterinary and Animal Husbandry, Government of Nagaland.

Datas represented in Table-2.2 ascertained that the growth rate of milk production is 6.67% from 2007-08 to 2008-09 which is commendable but the growth rate of milk from 2010-11 to 2011-12 is only 0.39% which is discouraging. Growth rate of meat is 14.58% from 2007-08 to 2008-09 which also falls to only 3.70% from 2010-11 to 2011-12. The reason for this sluggish growth in milk and meat production is due to improper implementation of schemes by the department and also due to the casual nature of our people in undertaking these activities.

Table 2.3: Milk Consumption Status

Year	Total Requirement of the State ('000 tonnes)	Availability (State Internal production) ('000 tonnes)	Monetary Value of Availability in the State (` in crores)	Total Shortfall in the State ('000 tonnes)	Total Import into the State ('000 tonnes)	Monetary Value of Import into the State (` in crores)
2006-07	155.28	67.00	100.00	88.28	-	132.41
2007-08	155.28	70.00	105.00	85.28	5.00	62.50
2008-09	155.28	70.00	105.00	85.28	5.00	62.50
2009-10	155.80	77.80	112.81	78.00	3.38	65.57
2010-11	154.71	77.84	155.68	76.87	3.35	64.99
2011-12	154.71	78.15	156.30	76.56	3.18	63.60
2012-13	155.80	79.54	182.94	76.26	3.11	62.36
2013-14	155.80	79.54	182.94	76.26	3.11	62.36

Sources: Department of Veterinary and Animal Husbandry, Government of Nagaland.

Table 2.4: Meat Consumption Status.

Year	Total Requirement of the State ('000 tonnes)	Availability (State Internal production) ('000 tonnes)	Monetary Value of Availability in the State (` in crores)	Total Shortfall in the State ('000 tonnes)	Total Import into the State ('000 tonnes)	Monetary Value of Import into the State (` in crores)
2006-07	61.82	54.00	270.00	7.82	NA	40.10
2007-08	98.5	55.21	441.68	43.29	19.00	152.00
2008-09	98.5	55.21	441.68	43.29	19.00	152.00
2009-10	103.40	65.58	508.24	37.82	19.20	153.60

2010-11	101.21	65.67	748.64	35.54	19.05	153.16
2011-12	101.21	68.10	776.34	33.11	17.50	152.42
2012-13	102.50	67.48	991.95	35.02	17.10	148.94
2013-14	102.50	67.48	991.95	35.02	17.10	148.94

Sources: Department of Veterinary and Animal Husbandry, Government of Nagaland.

Table-2.3 & Table -2.4, indicates that there is a shortfall of 48.62% and 49.48% against the total requirement of meat and milk in State internal production. The shortfalls are met with imports from other states of India and Myanmar. Many imports are not documented for Tax evasions. This contributes to the slow economic growth of the state.

EXISTING SETUP OF DEPARTMENT OF VETERINARY & ANIMAL HUSBANDRY, NAGALAND:

The Administrative Head is the Secretary of the Department of Animal Husbandry and Veterinary. He is assisted by one Addl. Secretary, one Joint Secretary, one Deputy Secretary along with supporting staff. The Directorate of Animal Husbandry & Veterinary was established in 1965. The Directorate was initially headed by a Deputy Director but it has now become a full fledged Directorate headed by a Director, assisted by 1 Additional Director, 18 Joint Directors and a number of Deputy Directors. There are 11 District Veterinary Offices headed by a District Veterinary Officer and 2 sub-divisions (Tseminyu & Mangkolemba) headed by Sub Divisional Veterinary Officers (SDVOs). The Department of Veterinary & Animal Husbandry, Nagaland, Kohima was established with the following activities which will be helpful for the socio- economic development of the people particularly for rural population:

- Livestock & Poultry Development
- Improvement of Seed Stock
- Dairy Development
- Conservation of Indigenous and Threatened Breeds
- Animal Health & Veterinary Services
- Creation of Employment Opportunities
- Enhancement of Food Basket

On the other hand, Nagaland State Veterinary Council (Directorate of Veterinary & A.H.), Kohima, Nagaland is the affiliated body of Nagaland constituted as per the provision of the Indian Veterinary Council Act, 1984.

The purpose of the establishment of the affiliated body on the 16th June, 1998 are as follows:

- Regulate Veterinary Practices
- Maintain registers of the Veterinary Practitioners as per the provision of Indian Veterinary Council Act, 1984.
- Profession Efficiency Development.

Nagaland State Dairy Co-operative Federation Ltd. was established in 2002 with the under-mentioned aims and objectives:

- To promote dairy development and related activities.
- To execute and set up Dairy Plants, Processing Units, Chilling Plants, Cattle Feed Plants, etc.
- To purchase raw materials (milk, feeds) processing and marketing.
- To promote and organize Milk Co-operative Societies and Unions.
- To impart training to staff and society members etc.

Role of the Affiliated Body (Advisory/ Managing/ Executive/ Others) are as follows:

- To execute dairy projects.
- To replicate dairy co-operative in all districts.
- To supervise the activities of co-operative dairying throughout the State.
- To impart training and skill development.

The Department of Veterinary and Animal Husbandry is producing quality cross heifers for breeding and propagation to the farmers. High yielding crossbreed cattle like Holstein & Jersey are being produced for dissemination. During 2012 – 13, a state of the art dairy cattle farm has being installed at State Cattle Breeding at Lerie, Kohima and work is in progress at Jalukie, Aliba & Tuensang under NABARD (National Bank for Agriculture and Rural Development) .The Nagaland State Dairy Co-Operative Federation Ltd. was set up as an apex body for dairy development in 2002. Since its inception, dairy development activities have been geared up with the establishment of Milk Processing / Chilling plants in almost all district Head Quarters to facilitate milk procurement and Marketing Avenue for dairy farmers.

Milk producers at the village level are organized to form Dairy Co-Operative Societies (DCS) or Women DCS depending upon viability, based on democratic principles and bye laws. Surplus milk of home/village is collected at the DCS/WDCS milk collection centre/office and after conducting quality test, the milk are transported to the dairy plant. Milk producers are provided with production enhancement inputs in the form of Balanced Cattle Feed and Complete Feed Blocks on no profit no loss basis and delivered to their doorstep. Assistance is provided to cultivate seasonal and perennial fodder crops. Health coverage is provided on regular basis

besides vaccination camps which are being conducted from time to time. Breed improvement service are regularly provided. Marketing of milk and milk products are through authorized dealers and retailers. Cold chain in the form of vici-coolers, deep freezers are being provided but not adequate due to resource constraint. Various training programmes on Dairy Animal Management, Clean Milk Production, First Aid, Health Care, DCS personnel, Dairy personnel etc. are imparted from time to time. Farmers and Board of Directors Orientation programmes are provided both inside and outside the state. Rural Dairy farming are being set up in the Milk Shed and Potential Areas for production of liquid milk in the state whereby, a total of 100 nos. of Dairy Farmers is being selected in the State with a target of producing 400 tonnes of liquid milk in one cycle of lactation. The milk produced from these farmers is fed to the Milk Plant for processing & value additions. Assistance in the form of induction of crossbred cattle/heifers, supportive medicine, capacity building etc; is being provided to the Dairy Cattle Farmers.

Growth of local pig is slow and grows not more than 45kg in 8-12 months. So farmers are more interested in rearing cross breed and Hampshire breed. Piggery sector is producing crossbred piglets like Hampshire & Large Black for breeding and propagation at the farmers' level. Recently, the Department of Veterinary and Animal Husbandry had introduced new germplasm of Hampshire and Large Black which was procured from outside the state to produce quality piglets. Construction of two pig breeding farms is in progress for production of commercial stock for the farmers under Caging System of rearing which is basically the latest method of pig breeding and production. Under RKVY (Rashtriya Krishi Vikas Yojana) Scheme, assistance is provided to the farmers in the form of livestock, medicine, feeds, equipments etc; for taking up breeding activities in their respective areas and villages. Besides, National Mission on Protein Supplement (NMPS) is also being taken up during 2012-13 for which one nucleus breeding farm is being

set up at Medziphema. The department has initiated setting up of Nagaland Composite Pig Project comprising of a Nucleus farm for Parent Stock at Jalukie and a Slaughter house at Khopanala, Shokuvi Village having a slaughter capacity of 150 pigs per shift of 6 hours duration. The main aim of this project is to produce sufficient pork for hygienic slaughtering & processing.

Table 2.5: Pig Breeding Centers in Nagaland.

SL. NO.	LOCATION
1	PBC Phek
2	PBC Tuensang
3	PBC Sathazou
4	PBC Wokha
5	PBC Jalukie
6	PBC Merangkong
7	PBC Akuluto
8	PBC Tizit
9	PBC Medziphema
10	PBC Lerie, Kohima

Source : Veterinary and Animal Husbandry Department, Nagaland.

NAGALAND LIVESTOCK DEVELOPMENT BOARD:

With a view to implement schemes which are funded by various Ministry through State Implementing Agency (SIA), the State had constituted the Nagaland State Livestock Development Board with the approval of the State Cabinet. This Board focuses toward providing assistance to the Livestock & Poultry farmers for development and production of meat, milk, eggs and its byproducts in the State with an assured market. Besides, it shall provide technical assistance and resources in Veterinary Services & Improvement of breeding facilities with a view to combat morbidity & mortality and also upgrade the local animals through crossbreeding programme with the latest

methodologies. Accordingly as per the by-law of the Board, the Board of Directors has been formed with the Administrative Head as the Chairman of the Board and one Senior Technical Officer as the Managing Director. At present, the Board is implementing the Centrally Sponsored Scheme called National Project on Cattle & Buffalo Breeding Programme and also the Livestock Insurance Scheme. In the State level, Board had taken over few Livestock & Poultry farms along with the existing manpower. During, 2011-12, the Board intends to achieve the following targets:-

- Produce quality piglets for the farmers
- Produce Low Input Technology Birds (Kuroiler / Venaraja / Black Rock) for the farmers
- Assist Dairy Cattle farmers with inputs like quality heifers, Artificial Insemination, Consultancy Services etc.

In order to achieve the above targets by the Board, the Department proposes to provide `5.00 lakhs as managerial grants to the Board during 2011-12 as follows:-

Sl. No.	**Particulars**	**2011-12 (` in lakh)**
1	Other charges (Managerial grant)	5.00
	Total	5.00

NAGALAND STATE DAIRY CO-OPERATIVE FEDERATION LTD. (NSDCF):

During 1986, the Kohima District Co- operative Milk Producers' Union Ltd. was registered with seven dairy cooperative societies in Dimapur under the erstwhile undivided Kohima district, beginning with a collection of about 200 litres per day, utilizing 2000 litres per day capacity Milk Chilling Plant, handed over to the Union by the Department of Veterinary and Animal Husbandry. The Kohima Milk Cooperative Union initially adopted its brand name KEVI, meaning "good" in Angami Dialect, which subsequently changed to KOMUL (Kohima Milk Union Ltd.). Over the years, there were increasing participation of farmers and societies in the first dairy cooperative Union in Dimapur district. Considering the steady progress made, a State of the Art 10000 litres capacity Dairy Processing Plant was set up and commissioned in 1997 with financial assistance from the Government of India. The new Dairy Processing Plant, the first of its kind in the state of Nagaland, produced milk and milk products such as Lassi, Dahi, flavoured milk and ice cream were launched in the market under the brand KOMUL which became a household name. Subsequently, with bifurcation of Kohima district into Kohima and Dimapur respectively, a separate Union was created under Dimapur district which came to be known as DIMUL (Dimapur Milk Union Ltd.) in the year 2007.

The Nagaland State Dairy Cooperative Federation Ltd. was formed with three District Milk Unions namely, Kohima, Dimapur and Mokokchung respectively in 2002 and is a registered entity under Small Scale Industries (SSI) Regulation Act. It continues to use KOMUL as its brand in its operational areas under Kohima, Wokha, Mokokchung and Pfutsero (Phek) districts. However, to keep up with the changing role, the Board of Directors' of Dairy Cooperative Federation, decided to change the brand name from KOMUL to MILKCON (Milk Cooperatives of Nagaland) in 2012-13, during

the commissioning of the 2nd Dairy Processing Plant in Nagaland with 10000 litres capacity at Kohima. Works are in active progress to establish and commission Milk chilling Plants at Tuensang and Zunheboto. Besides, a number of milk Bulk Milk Cooling Unit (BMCU) are also being set up in selected milk shed areas/societies as feeder units for Dairy Plants. There are also some number of defunct units and feed plants due to technical problems, resource unavailability and inefficient management eg. the Milk Chilling Plants in Wokha, Mon and Tuensang.

The Details of current operational Dairy and related infrastructure and their locations under NSDCF ltd. are shown below;

Table 2.6: The Operational Dairy Processing/Chilling Plants and their Locations:

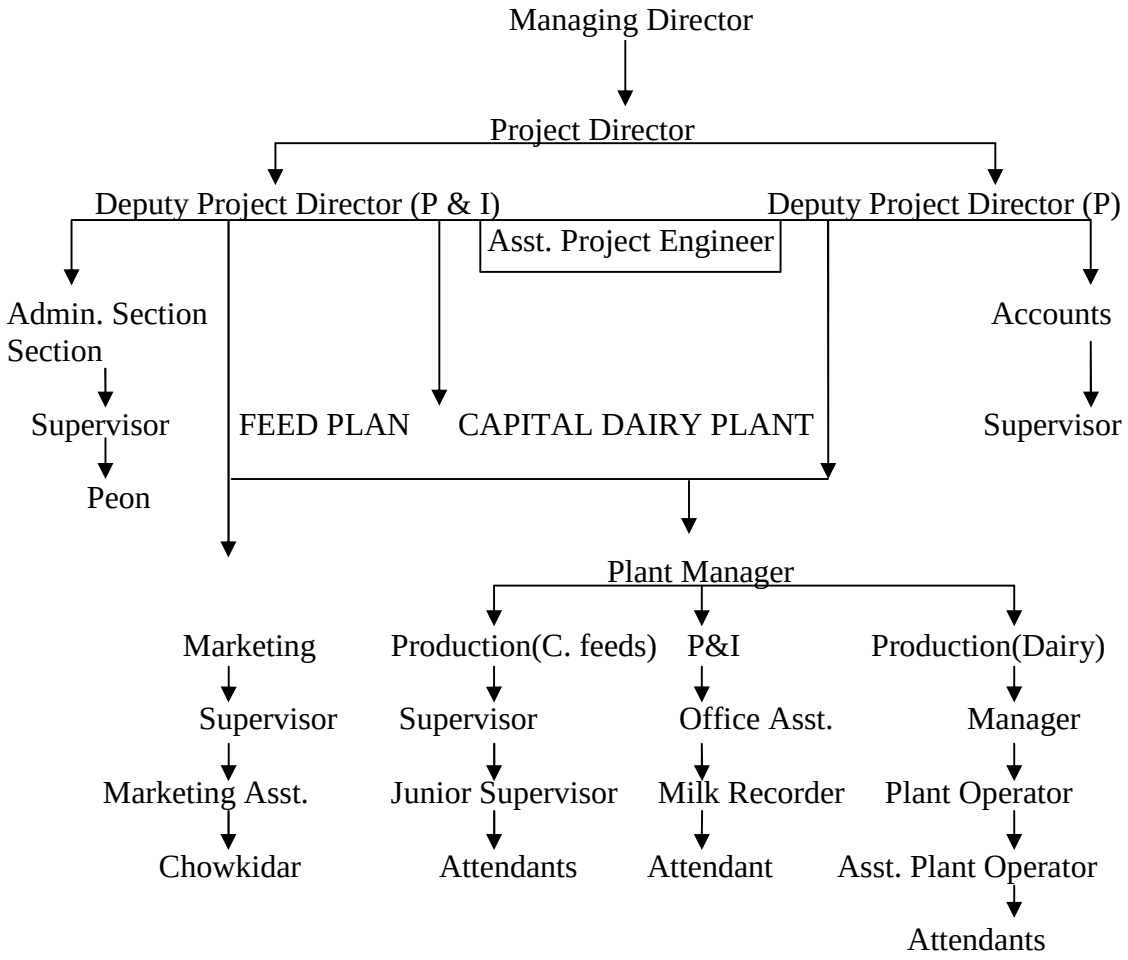
SL. NO.	PLANT & LOCATION	CAPACITY	STATUS
1.	Dimapur Central Dairy	10000	Functional
2.	Mini Dairy Plant, Kohima	2000 LPD	Functional
3.	Mini Dairy Plant, Mokokchung	2000 LPD	Functional
4.	Milk Chilling Plant, Pfutsero	1000 LPD	Functional
5.	Ice-Cream Plant, Dimapur	500 LPD	Functional
6.	Livestock Feed Plant, Kohima	2 TPH	Functional
7.	Livestock Feed Plant, Dimapur	0.5 TPH	Functional
8.	Complete Feed Block Plant, Kohima	0.5 TPH	Functional

Source : Veterinary and Animal Husbandry Department, Nagaland.

LPD = Litre Per Day, TPH = Tonne Per Hour

ORGANISATIONAL STRUCTURE:

Figure 2.1: Organisational Structure of NSDCF Ltd.



During the 11th plan, the Ministry of Agriculture, department of Veterinary and Animal Husbandry & dairying focused towards bringing a white revolution in the state for self sufficiency in milk. In order to achieve this ambitious goal, the department set up Milk processing/ Chilling Plants in all the District headquarters and selected Milk Shed Areas for providing Marketing Avenue to the rural milk producers. The department during 2007-08 had inducted high milking germplasm of Cattle/Buffaloes in the State especially to those Cooperative Societies/ Farmers who have already federated with the State Dairy Federation so that they produce surplus milk for processing. Farmers were also given assured buyback through organized

system of milk procurement, processing and marketing facilities created by tying up with KOMUL/DIMUL. During 2012-13, a state-of-art model Dairy cattle farm is being constructed under NABARD at Lerie, Kohima and works are also in progress at Jalukie, Aliba and Tuensang district.

However, milk producers at the village level are organized to form Dairy Co-Operative Societies (DCS) or Women DCS depending upon viability, based on democratic principles and bye laws.

Table 2.7: Benchmark on Dairy Cooperative Societies.

District	Current (2012 - 13)	Projected (2020)
Dimapur	49	100
Kohima	24	50
Wokha	3	20
Mokokchung	12	30
Pfutsero	3	10

OPERATONAL MODULE:

(i) Milk Procurement:

Surplus milk produced after home/village retention are collected at the DCS/WDCS milk collection centre/office and after mandatory quality test conducted are transported to the dairy plant. Milk Unions/Federation collects the milk through its procurement vans following specific daily schedule under different milk routes. Milk price is based on 2 axis i.e. fat and SNF (Solid-Non-Fat). Average quality of milk having 4% fat and 8% SNF will fetch `30 at current price, which is revised at least once a year. Payment to farmers is normally once a month.

Table 2.8: Benchmark on Procurement ('000 litres per day).

District	Current (2012-13)	Projected (2020)
Dimapur	3.00	10.00
Kohima	1.30	5.00
Wokha	0.10	0.50
Mokokchung	0.10	1.00
Pfutsero	0.15	0.50

(ii) Milk Processing:

Milk collected from the producers are brought to the Dairy Plant and after mandatory and regular quality test done, is subjected to processing. Milk is normally pasteurized, chilled and packed in pouches. Milk products or value addition becomes an essential component of dairy production in the factories.

Table 2.9: Benchmark on Milk Marketing

District	Current (2012 - 2013)	Projected (2020)
Dimapur:		
Toned milk (MT)	1800.00	3650.00
Lassi (MT)	1000.00	1500.00
Dahi (MT)	40.00	100.00
Ice Cream (MT)	100.00	200.00
Kohima:		
Toned Milk (MT)	470.00	2000.00
Products to launched shortly:	NA	NA
Packaged drinking water		

(iii) Marketing and Sales Promotion:

Marketing of milk and milk products are through authorized dealers and retailers. Cold chain in the form of vici-coolers, deep freezers are being provided but not adequate due to resource constraint. Sales promotion is mainly through advertisements –Milkcon has roped in as its representative, Ms. Chekrovolu Swuro, the first woman Olympian from Nagaland who represents a new generation of rising Nagas and is an inspiration to the Naga youths, the campaign is being launched with the new tagline "Promote Milkcon, Promote Genuine Nagaland Product".

ADDITIONAL SUPPORT AND DEVELOPMENTAL UNDERTAKINGS:

(i) Support service to producers:

Milk producers are provided with production enhancement inputs in the form of balanced Cattle Feed and Complete Feed Blocks on no profit no loss basis and delivered to their doorstep. Assistance is provided to cultivate seasonal and perennial fodder crops. Health cover on regular and emergencies and vaccination camps are extended to all the producers. Training and skill up gradation is given from time to time, including clean milk production kits. Breed improvement service are regularly provided.

(ii) Training and Skill Development:

Various training programmes on Dairy Animal Management, Clean Milk Production, First Aid, Health Care, DCS personnel, Dairy personnel etc. are imparted from time to time. Farmers and Board of Directors Orientation programmes are provided both inside and outside the state.

Table 2.10: Existing Man Power:

Dimapur:		
Executives	:	3 nos
Supervisors	:	6 nos
Others	:	30 nos
Kohima and other Districts:		
Executives	:	7 nos
Supervisors	:	10 nos
Others	:	20 nos
Total	**:**	**76 nos**

(iii) Promotion of Indigenous Fodder Trees:

With the view to provide green fodder in the winter season, a project (for the duration of 2009 – 2011) to promote cultivation of selected indigenous fodder trees is being launched as a pilot project to be implemented initially in Dimapur, Kohima and Mokokchung Districts. Fodder trees are to be planted/grown along boundaries and slopes where other crops cannot be cultivated keeping minimum space of 10' – 15' interval. Saplings are to be sourced via individual collection and the season of propagation is May to August.

Selected fodder trees are;

- Khrabvii (Ficus Hookerie)
- Temichiede (Ficus Hirta)
- Thumero (Lagerstroemia)
- Pezie (Cherry)

Financial incentives for fodder trees growers:

The society members/milk producers after cultivation of selected fodder tree will inform the Milk Union CEO/GM who will verify the works done along with the photo profiling and submit report to the Dairy Federation. Based on satisfactory report, the Federation will release the incentives to the farmers in two installments.

1st year : `30/- per tree

2nd year: `20/- per tree

(iv) Empowering Women through Co-Operative Dairying:

Women Empowerment:

The project on "Support to Training & Employment programme for Women (STEP)", has been designed to create and promote general awareness on socio-economic issues, challenges and opportunities as well as sensitive gender related issues confronting the weaker section of the society. Women Dairy Co-Operative Societies (WDCS) provide a good platform where women members interact on various matters of health, nutrition, clean milk production, fertility, economic feasibility and profitability which are issues intrinsically related to both animal and human well being. It is through WDCS, the women members increasingly participate not only in improving production and productivity but enabling them control over resources in planning and decision making processes whereby women becomes truly empowered.

In order to improve the well being of the poor and marginalized women of the society, a programme called "Support to Training & Employment Programme for Women (STEP)", was launched by the Central Government sponsored by the Ministry of Women & Child Development, Government of India with Nagaland State Dairy Co-Operative Federation Ltd. as Nodal Agency in 1986. The programme envisaged to extend training and support

services to the women groups to ensure sustainable economic activity for self employment through action oriented projects including dairying. The Nagaland chapter of STEP programme aim to organize women owned Dairy Co-Operative Societies (DCS) involving members belonging to marginalized, tribal women below poverty line, which are led and fully managed by women.

SALIENT ACTIVITIES UNDER SUPPORT TO TRAINING & EMPLOYMENT PROGRAMME (STEP) :

- **Training & Skill Development:**

Various training programmes on Management Committee Members, Secretaries, A.I Workers, First- Aid, Health Care etc. are imparted at its Federations' Office - cum – Training Centre at Lerie, Kohima.

- **Women dairy Co-operative Societies (WDCS):**

The implementing agency endeavours to organize Women dairy Co-Operative Societies led and managed by women where all milk testing kits, cans, signboards, furniture, stationeries etc. are provided to the functional societies.

- **Milk procurement Processing & Marketing:**

At WDCS level, milk is collected from the individual members at a centrally located collection centre where each individual's milk is tested for Fat & SNF content for determining the price. Once the milk collection, testing and recording is done, the entire quantity is pooled together and sent to the dairy Plant for processing and marketing. The organized Dairy Co-Operatives provide an assured marketing avenue for the farmers' produce.

- **Support Services:**

Cattle feed: KOMUL has an established Cattle Feed Plant at Dimapur where balanced cattle rations are prepared and distributed to societies

through its milk vans on regular basis. The rations are scientifically computed to provide optimum nutrition for animals and sold at controlled rate.

Dairy Unit: The STEP has in-built component to provide one dairy cow on partly loan and grant basis to the most needy and deserving women members in phased manner.

Fodder Development: Women members of the Dairy Co-Operatives are assisted to grow high yielding varieties of fodder crops by adoption of relay cropping system and approved agronomic practices.

Artificial Insemination (A.I) & Health Coverage: The project envisaged to train A.I workers from each WDCS, who are fully equipped with A.I kits, cryocans, frozen semen straws for insemination of milch animals. The Federation routinely undertakes vaccination programmes in the DCS/WDCS particularly against FMD (Foot & Mouth Disease) .

GROWTH AND PERFORMANCE :

The growth and performance of Nagaland State Dairy Co-Operative Federation Ltd. can be discussed as follows:

- The federation has set up a unit for manufacture of Complete Feed Block (CFB) at the existing Livestock Feed Plant Kohima, formally launched on 2nd March 2012 at Lerie, Kohima. A Farmers' Orientation Programme was conducted on the same day.
- To supplement preservation of Fodder, the Federation has taken up few functional Dairy Co-operatives for silage making pilot basis. Intensive fodder production has been taken up to facilitate the availability of much needed fodder to the animals through distribution of Fodder Mini-Kits such as maize, oats seeds etc. A centrally sponsored scheme

on feed and Fodder Development has also been implemented, under which the progressive Dairy farmers were given manual & Power Chaff Cutters to facilitate proper utilization of available fodder resources.

- To boost up Milk production in the milk shed areas, a comprehensive package has been formulated to undertake massive cattle induction under Accelerated Dairy Development Project during 2010-11. Under this programme, the Federation has inducted 50 units of dairy cattle, each unit consisting of 2 animals. The Federation has also selected 10 beneficiary villages for setting up of Community Dairy Project. Each selected beneficiary was provided with 10 nos. of milking cows/pregnant heifers, housing, furniture, milk testing equipment etc.
- In order to enhance the quality of milk at the grass-root level, mass awareness campaign and training were conducted amongst the Progressive dairy Farmers in several organized dairy Cooperative Societies during 2012-13. Apart from awareness generation, the beneficiary trainees were given Clean Milk Production Kits.
- 3 – Days Farmers Induction Programme (FIP) was held at Purabi Dairy, Guwahati organized by West Assam Milk Union Ltd. (WAMUL) from 11th to 13th March 2013. Altogether, 20 Dairy Farmers from Kohima District attended the training.
- A 3-days In-house training on professional Skill Development was conducted with the resource person from Nagaland Career Development Centre, Youth Net from 18th to 20th March 2013. All the officers and staff of the Federation attended the training.
- Under a Centrally Sponsored Scheme of Integrated Dairy Development Project, the Federation has initiated to establish a new state of the art Dairy Plant of 10000 litres capacity at Kohima which will be equipped

with UHT Plant and Milk product manufacturing unit of Flavoured Lassi, Paneer and Yoghurt. The Plant was formally inaugurated on 3rd June 2013. The UHT and Aseptic Packaging Unit was imported from Shanghai, China and the same was installed and commissioned by the Chinese Engineers themselves during 15th May to 5th June 2013.

The department of Veterinary and Animal Husbandry of Nagaland which came into existence from 1965 has been entrusted with the responsibility in response of all matters relating to livestock and poultry development including health, feed and fodder and Livestock Statistics. According to the Statistical Handbook of Nagaland'2014, the department has established 11 veterinary hospitals, 23 dispensaries, 130 Veterinary Health centers and 19 functional Quarantine Checkpost's. These institutions provide Veterinary services & consultancy to the needy farmers and progressive livestock farmers, both in the rural and urban areas.

PIGGERY SECTOR DEVELOPMENT:

Piggery Sector plays an important role in the socio-economic development of the farmers. In rural areas, backyard farming is very popular and common which acts as a bank in times of need. In peri-urban areas, many semi-commercial piggery farms are cropping up which is providing employment, financial assistance and also meeting the pork demand of the state to some extent. Presently, the Department of Veterinary & Animal Husbandry is maintaining 10 No. of functional Piggery farms. These farms are producing crossbred piglet to the farmers for their parent stock.

NAGALAND STATE PIGGERY CO-OPERATIVES FEDERATION (NSPCF) Ltd.:

The NSPCF was established on 12-03-2002 at Kohima. It is a State level Cooperative Organization. The structure of NSPCF consists of the Union of primary Piggery level Cooperative Societies who are elected to Board of Directors of the Union. The day to day activities are managed by a management composed of professionals from various disciplines. It is an apex body of Piggery Development activities in the state in technical collaboration with the Veterinary & Animal Husbandry Department, with an objective of organizing District level Unions to enhance meat production, procurement and marketing.

The main objectives / activities of NSPCF Ltd. are as follows:

- Setting up piggery farms.
- It also provides training on Manpower development.
- Providing breeding inputs and technical services to the farmer producers.
- This federation stressed to boost meat production in a large scale in the State through Piggery Farming.

The Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India will implement a National Mission for Protein Supplements (NMPS) in identified states (Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Uttar Pradesh and Paschim Banga) during financial year 2012-13, to implement pig component of NMPS. An allocation of `40.00 crores has been earmarked to encourage meat production from piggery.

The objective of the scheme is to promote availability of high grade crossbred piglets through pig breeding and multiplication units with the under mentioned permitted activities :

- Establishment/ strengthening of 16 Pig Breeding Nucleus Units in 16 selected states with proven potential.
- Nucleus centre will have 0-18 Satellite Field Breeding Units.
- Each nucleus centre will produce 5,000 breeding piglets per year for distribution to the satellite units and other farmers for breeding purposes.
- Piglets produced at satellite Field Breeding Units will be fattened for meat either at these centers or at the units of other beneficiaries.

Funding pattern:

100 % grant as subsidy for different activities under the scheme.

Table 2.11: The Detail Breakup of Unit Cost are as follows:

(Pig Breeding Nucleus Unit)	(Amount ` in lakhs)
Construction / Renovation of pens for Boars, Sows, Farrowing, Growers	48.00
Equipment / accessories	2.00
Procurement and transportation of breeding stock: 300 sows @ `	40.00
10,000/ 8 months gilt 40 boars (8 month age) @ ` 15,000	(Amount ` in lakhs)
Feeding costs (340 animals, @ 3 kg. x 365 days –` 20.00 per kg.	30.00
Establishing / Renovating feed mill & allied expenses	20.00
Semen collection, freezing / storage / importation:	25.00

Misc. medicine, vaccines, insurance, labour etc.	15.00
Cost of each Nucleus Breeding Unit	180.00

Table 2.12: Satellite Field Breeding Unit:

Animals = Free of cost, 20 female + 4 males will be supplied by Nucleus Breeding centre	(Amount ` in lakhs)
Establishment and running costs per unit for one year	15.00
Cost of 10 satellite units (Construction of sheds, equipment, labour, medicine, feed etc.)	= 15 x 10 = 150.00
Total Cost of each complete Unit (one Nucleus + 10)	330.00

The states of Andhra Pradesh, Assam Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Odisha, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and Paschim Banga account for more than 80% of the pig population in the country. This is also indicative of popularity of pigs in these states and possibility of better results with appropriate breeding management and health strategies. The mission is being implemented in these states. Beneficiaries will be selected from SC / ST communities and BPL families in the rural areas.

The Department of Veterinary and Animal Husbandry of the respective States will be the nodal agency for implementation. The project will be implemented under the RKVY in accordance with existing guidelines. State Government is also advised to build up synergy through partnership with research institutions as well as existing developmental schemes. Panchayati Raj Institutions should also be involved in implementation to ensure a greater degree of effectiveness. In addition, states will be required to bear full cost of

staff salary including any increase, maintenance of vehicle, office contingencies and acquisition of land etc. wherever necessary.

The NMPS will be implemented as a sub-scheme of Rashtriya Krishi Vikas Yojana (RKVY). The programme will be operationalised through a three-tier planning-implementation-reviewing structure. The planning process will follow a decentralized approach. Panchayati Raj Institutions or similar Local Govt. Institutions/line departments will select the beneficiaries and identify appropriate interventions in the villages/clusters in consultation with State Agriculture Units (SAU's), Agricultural Technology Management Agency (ATMA), Watershed Committee (WC) and other similar agencies. The respective work plans for the year will be compiled by the District Animal Husbandry Officer/Deputy Director (Animal Husbandry) for inclusion in the District Agriculture Plan (DAP). The DAP's will be appraised at the State Level for inclusion in the consolidated State Agriculture Plan (SAP). Respective SAU's will submit their project proposals directly to the State Department of Agriculture for inclusion in the SAP. The SAP will be finalized and consolidated in consultation with Department of Animal Husbandry. The consolidated SAP will be considered and approved by State Level Sanctioning Committee (SLSC) of RKVY as per standard procedures.

At the National Level, Department of Agriculture & Cooperation, Ministry of Agriculture will oversee the activities of the programme and accord approval to the State's Proposal in consultation with the Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture. The Department of Agriculture will be the nodal agency at the State Level to implement the programme in collaboration with the State Department of Animal Husbandry. The State Governments will further nominate, select or create 4 suitable agencies for implementing the programme at the district level. Such agencies could be line departments, Zilla Panchayats, Agriculture Technology Management Agency (ATMA), Watershed Committee (WC),

Self Help Groups, NGO's etc. The programme will be implemented in a 'Project Mode'.

At the field or village level, the Panchayats will be involved in overseeing the process of implementation. At the district level, reporting and reviewing will be undertaken by Deputy Director (Agriculture) supported by other line departments and respective Zilla Panchayati Raj Institutions. At the State level, the activities of the programme will be reviewed by Department of Agriculture under the chairmanship of the Secretary (Agriculture)/Agricultural Production Commissioner (APC). The State Department of Agriculture will ensure the submission of QPR which should reach the Department of Agriculture & Cooperation, Ministry of Agriculture within 20 days of completion of the quarter. Similarly, the detailed Annual Progress Report (APR) should be sent within two months after the end of the year. At the National level, bi-annual review of the activities of the programme will be undertaken. A combination of periodic desk review, field visits etc. will be adopted for monitoring the efficacy of the programme with the involvement of ICAR, National Research Centre on Pigs (NRCP), Rani (Guwahati) etc. and taking recourse to course correction measures, if any. Quarterly/Annual progress reports indicating physical and financial achievements shall be furnished periodically in prescribed proforma. Details of beneficiaries and area covered under the scheme must be placed on the department web site, and it should be mentioned in the progress report. Accounts of the implementing agency shall be subject to audit by Chartered Accountants appointed by Government and/or by such other officers of Government of India/State Governments as required under rules and a report in this regard should be intimated to this Department.

RURAL PIGGERY PRODUCTION PROGRAMMES SINCE 2012-13 ONWARDS:

This is being conceived with a view to revive and improve the traditional rural backyard farming to enhance the level of production. The existing scenario of rural Piggery production programmes with effect from 2012 – 13 are as follows:

This programme shall be implemented with the following objectives:

- Enhance meat production in the State.
- Encourage the farmers to take up breeding farms.
- Provide assistance for sustainable livestock farming to the farmers.
- Reduce the gap of import from outside the State.
- Improve the socio-economic status of the farmers.

This programme is designed to enhance meat production both in peri-urban and rural areas, through breeding for production of piglets. The project shall be implemented in peri-urban areas targeting the towns and commercial areas of the State and rural farming shall target the rural populace through Rural Piggery Production with a breeding ratio of 4 females & 1male.

This programme is designed to produce meat through peoples' participation, and the funding of the programme shall be on Public Private Participation (PPP) mode as follows:-

1. Land - Entrepreneur
2. Site development - Entrepreneur
3. Infrastructures - Department (Pre-fabricated structures & Roofing with site installation)
4. Walls, floors etc - Entrepreneur (Lump sum grant shall be provided by the Department) (up to plinth level)

5. Water supply - Entrepreneur
6. Power supply - Entrepreneur
7. Fodder land - Entrepreneur
8. Livestock - Department
9. Feeds - Department
10. Veterinary Aids - Department
11. Machinery and equipment - Department

The Department shall provide all logistic support to the farmer for one (1) cycle of production including marketing if requested by the beneficiary. Further, capacity building shall be provided to the selected farmers for 3-5 days, including both theory & practical session with farm visit. The Department shall also conduct monitoring activities during project operation and post operation.

The main purpose of this scheme is to produce piglets on small scale especially in peri-urban & rural areas for sale of piglets to the needy piggery farmers for taking up backyard piggery. The breeding ratio of this farm shall be in the ratio 4:1 female to male respectively. The Department shall assist the Farmers / Entrepreneur as follows:

- Infrastructure (Pre-fabricated tubular structures with roofing and installation)
- Parent stock
- Concentrate feeds
- Veterinary aids.
- Machineries & Equipments.

On selection of the beneficiaries, a compulsory training on Piggery management course shall be conducted. The training course shall be tailor made, which shall be designed by the respective DVO as per the prevailing district conditions and requirement. The beneficiaries shall have to undergo theory course for 4 days and 1 day practical & field visit to piggery farms within the district / state.

This project is expected to provide direct employment to 152 persons as skilled labour, besides providing indirect employment to another 152 persons as unskilled labour. It is expected to generate 389.12 tonnes of Meat worth `5.83 crores per cycle of production through an investment of `6.00 crores during 2012-13 under State Plan.

Pig breeding requires some technical knowledge on breed, selection of male and female pigs, heat detection, care and management of pregnant sow and newborn piglets etc. Rural migration to urban areas is a continuous and irreversible process. This tendency to opt for urban life can be greatly reduced if the living standard of the rural economy is improved. Livestock farming in a scientific and profitable way can play a vital role in improving the rural economy. A strong need has been felt to establish sufficient pig breeder farms to produce quality disease free animals. The mortality rate of piglets and adult sows can be reduced greatly with mass vaccination and de-worming. Improved bio-security and hygiene at farm level are essential in controlling zoonotic diseases. It must be ensured that the farm workers are protected and the pork be safe, healthy and wholesome.

To sensitize farmers about the importance of scientific breeding management and artificial insemination of pigs, Indian Council of Agriculture Research (ICAR) Regional Council, Nagaland Centre, Jharnapani, in collaboration with NABARD and NEPED-NRTT(Nagaland Empowerment of People through Economic Development), Nagaland, has organized a training programme for some beneficiaries. ICAR has been promoting pig breeding

through artificial insemination with the aim of fulfilling the demand of superior germplasm at farmers' door steps. However, these programmes are few and far between and as study suggests most of the farmers from rural Nagaland are not privy to these benefits; as strict implementation of various schemes and proper utilization of grant in aids/resources is not followed. The Nagaland Dairy Federation is said to have set up Milk Chilling Plants, Bulk Milk Coolers in various district Headquarters. Of late, a new state of the art Dairy Processing Plant in the name and style of Capital Dairy has been set up and commissioned on 3rd June 2013. It is equipped with Ultra High Temperature (UHT) and Aseptic Packaging Unit, the first of its kind in the whole of East Zone and Northeast Region, to produce long shelf life toned milk. The UHT plant was however, discontinued within a short period of production citing technical problems. Many pig breeding farms, feed production centre set up by the government are not properly managed and becomes defunct within few months and schemes/projects are not taken to their full completion. The concerned department needs to undertake mass awareness campaign and training programmes and advocate sensitization of farmers towards scientific breeding methods and feed supplements. The establishment of large Government and Institutional farms should therefore be supplemented with an active programme to stimulate the small farmers to accept Dairy and Piggery Enterprises as part of rural activities. Milk producers are provided with production enhancement inputs in the form of Balanced Cattle Feed and Complete Feed Blocks on no profit no loss basis and delivered to their doorstep. Assistance is provided to cultivate seasonal and perennial fodder crops. Health coverage is said to be provided on regular basis besides vaccination camps which are being conducted from time to time. Breed improvement service are regularly provided. Marketing of milk and milk products are through authorized dealers and retailers. Cold chain in the form of vici-coolers, deep freezers are being provided but not adequate

due to resource constraint. Various training programmes on Dairy Animal Management, Clean Milk Production, First Aid, Health Care, DCS personnel, Dairy personnel etc. are imparted from time to time. Herd size and milk price have less impact on dairy farm profitability than might be thought. Each dairy cow has very high fixed costs associated with it in terms of buildings, land and labour. The more milk that cow produces and the greater her feed efficiency the more profitable she is. Especially if the contribution made by home grown feeds is improved. This does not mean cutting concentrate costs. It means, growing and conserving more and better quality forage, feeding to meet the full nutritional requirements for the cows increased milk yield as well as feeding and managing cows for improved herd health and greater rumen efficiency. Lifting milk output through improved nutrition can result in dramatic improvements in overall dairy farm profitability.

From the above discussion, it is ascertained that, the Dairy and piggery farming has tremendous potential of increasing the nutritional status of millions of people suffering from protein and vitamin deficiencies. In spite of the rising demand , pig population and milk production is yet to reach the optimum needs of the state. The Nagaland government has set the target of becoming the first state in the country to become self-sufficient in meat production by 2020. Under the policy, Animal protein for all: Securing food basket through sustainable livestock and poultry farming, the department of veterinary and animal husbandry has taken up ambitious schemes by involving cross-sections of people, including the HIV-infected and the physically challenged. State government officials said by 2020, Nagaland is expected to export meat to other parts of the country and also to South East Asia. During the eleventh five year plan, the department is focusing on development of piggery and poultry for meat production and infusion of superior germplasm of dairy cattle for milk production to narrow the gap between the demand and supply of animal husbandry products. The state

government has also initiated the process of setting up a veterinary college at Jalukie(100km from Kohima), to promote veterinary practice and to enhance production of meat. Pork Chop established in 2014 by local naga entrepreneurs with an aim to sell local produced pork meat is a huge step in encouraging the farmers. They have started the initiative of providing hygienic marketing of pork meat and more branches are cropping up in different parts of the state aiming to encourage local farmers to take up these enterprises.

CHAPTER III

SUPPLY CHAIN OF INPUTS TO THE DAIRY AND PIGGERY ENTERPRISES AND MARKETING CHANNEL OF DISTRIBUTION OF FARMS OUTPUT OF THE STATE.

Farmers' decisions to keep livestock are influenced by a number of household factors and the surrounding socio-economic environment. The variables which influences farmers' decision in keeping livestock includes farmer's experience and management skills, occupation, social group, land and labour endowments, access to credit, media, etc. The family size can be taken as a proxy for availability of labour for rearing of livestock by the households; whereas, for domestic dairy and piggery enterprises of Nagaland sufficient availability of family labour facilitates the livestock rearing capability. Occupation of the household also has a significant role in the decision making for adopting an enterprise. The labourers may face trade-offs between allocation of their labour for wage earning and rearing livestock to supplement their household income. Further, other resource constraints can also discourage them to go for livestock rearing. Significantly, the households self-employed in agriculture are positively inclined towards livestock rearing. These were expected, as households whose primary occupation was self-employment in agriculture would like to maximize their income by pursuing agricultural and allied activities. They also gained comparative advantage of experience, skills and availability of agricultural by-products for livestock as feed and fodder. The effect of other demographic variables like age and sex of the head of the household was not significant. Studies have shown relationship between farm size and livestock rearing significance, which indicated the existence of strong crop-livestock interaction. It was expected that with increase in size of holding, the availability of feed and fodder would increase. This means assured irrigation by ensuring availability of fodders; particularly green fodders, induces farmers to keep livestock. Possession of assured irrigation facility also reduces the risk of fodder shortage. Access to farm households to institutional credit though influences the farmers' decision to rear livestock positively, but not significantly. The access to different information sources had different influences on farmers' decision to rear

livestock. Most of the states showed positive and significant effect, which indicated the role of state in promoting livestock development. Some states were more proactive to encourage farmers to keep livestock by institutional, technological and policy interventions, while some of the states lagged behind.

The profits in dairy and piggery farming depend mainly on a favorable relationship between the cost involved in producing the products, milk and meat and the income received for the products. The cost of inputs is largely contributed by the cost of feed and labour in dairy farming and by the cost of feed in piggery farming. The quality breed of animal, availability of feeds and fodders, veterinary aid, facilities for marketing of the products and management efficiency are some of the important factors which effect the economy of dairy and piggery farming. The production of milk is to be increased by using modern technologies of dairy husbandry such as judicious cross-breeding with exotic animals which will make it possible to introduce into Indian cattle the germplasm for high production, earlier sexual maturity and regular breeding resulting in substantial increase in milk production of our country. Many of the most successful and most profitable farms are increasingly recognizing that one person cannot be an expert in all areas and are working closely with a team of outside support specialists, including their nutritionist, agronomist, vet, and others. These people can be a valuable asset to the business. Working closely with these subject experts and making them part of the team, will bring about successful business ventures. Time spent managing the business effectively is likely to yield a higher return than any other task on the farm. This is where most returns on investment can be achieved. With soaring food prices, indigenous people in India are going back to raising small local black pigs. Over 50% of the total milk production in India consists of buffalo milk. As it has higher fat and total solid content, buffalo milk gives higher outturn of milk products than cow milk. However,

due to some basic differences in its physio –chemical properties, the use of buffalo milk creates a few special problems during product manufacture and storage. The problems arising out of the compositional and physio-chemical characteristics of buffalo milk can be solved by applying modified techniques. It is seen at most places that dairy and piggery entrepreneurs are not aware of the economics of the day to day business as it is a traditional form of business which has been carried on by generations together. Most commonly, farmers who rear livestock animals for milk/ meat have very little or no idea about the expenses (per day) involved in raising the animals. It is interesting to know that a farmer is even unaware of the fact that the feeding cost of his animals comprises of more than 70% of the total cost of raising the animals. With knowledge-based support, they could become more progressive, tap into new market opportunities and double their incomes.

North East India is the easternmost region of the country consisting of the contiguous Seven Sister States (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura), and the Himalayan state of Sikkim covering an area of 262,230 km^2 (101,250 sq m) which is nearly 8% of the total area of the country. It is home to approximately 40 million (2011 census), i.e. 3.1% of the total Indian population. The region is linguistically and culturally very distinct from the other states of India and officially recognized as a special category of States. The economy is agrarian. The Northeast region fall under high rainfall zone and is characterized by different topographical terrain, wide variation in altitude, slope, land tenure systems, agricultural and animal husbandry practices. Along with settled agriculture, jhum (slash-and-burn) cultivation is still practiced by few indigenous groups of people. The inaccessible terrain and internal disturbances has made rapid industrialization difficult in the region. Nagaland is among the country's mountainous northeast corner and is home to 1.99 million people. 19% of the population or 3,99,000 people live below the poverty line of which 3,87,000

live in rural areas.[Poverty statistics source: Government of India Planning Commission (2007)]. To estimate the production of milk, egg, wool and meat, State-wise, the Central Government provides grant-in-aid to the NER on 90:10 basis (ie. 90% funded by Central govt. and 10% by State) for the implementation of Integrated Sample Survey Scheme. The major part of the funds is utilized on the salaries and allowances of the staff employed under the scheme. NER has a majority meat eating populace and accounts for more than 40% of pork production of the country. However, the trend of regular milk consumption is yet to catch up here and production in

comparison to mainland India is very low.

SUPPLY ECONOMICS OF NAGALAND:

In Nagaland, evaluation and assessment of the market revealed that majority of the animals for dairy and piggery enterprises are purchased from the agents who bring piglets and calves from neighboring states like Assam and Manipur at a much higher price. The primary supply of animals is therefore from out of state and this often results in higher cost of production and reduced annual income. In Nagaland, even remote villages are affected by the rising global prices of milk, meat and cereals due to high import. Public health hazard posed by unregulated pork imports from unknown sources is another major issue that needs to be tackled. Local and doom pig are reared for both meat and piglet production. The growth rate and reproductive performance of these pigs are far below average. However, the meat is palatable and of high market value. The pigs are resistant to common diseases and thrive well in the indigenous free range system. Hampshire X, Large Black X, Ghungroo and Burmese black are the most common and preferred breeds of pigs among the pig farming community due to their black coat. The preference of cross-bred pig is high among the pig rearing community in the state for its higher growth rate and reproductive performance. However,

preference of local pork is higher in comparison to cross-bred /imported breeds among the consumers. The government provides schemes and subsidies to assist farmers and help establish farms but due to mismanagement, only a meagre portion is utilized for the same. Most of the farms are not government sponsored but they are individual's efforts. When we look at the village level, we see almost every family rearing pigs but rearing cow is a rare phenomenon. Cows are usually reared by rich people with ample land resources. Cows have much potential but in the Naga context, only meat and milk are extracted and is the most important and productive dairy animal in the state.

Though still in its infancy, the dairy industry in Nagaland has made its presence felt by supplying milk not only to consumers in the state, but also to the districts of Assam. Animal husbandry department officials said that apart from the local population, security forces stationed in different parts of Nagaland are regular customers. This constitutes an achievement of sort, considering that till a decade ago milk production and marketing was monopolized by Nepali Khutiwalas (persons involved in rearing cattle). With the setting up of milk chilling plants in places like Dimapur, Kohima, Mokokchung, Pfutsero and Wokha, Naga farmers have now taken up milk production as a serious business and women are taking the lead in rearing cows in urban and semi-urban places. Traditionally, the Nagas were never inclined to rear cattle for production of milk as they did not have milk culture like the people of mainland India. Now, toned milk and other milk products in poly packs and cups like lassi, ice cream, dahi .etc. under brand names MILKCON and DIMUL are sold not only in Nagaland but also in neighbouring Assam. Two district-level milk producer's Union of Kohima and Dimapur have emerged as successful co-operative movements with going number of individual naga women or group venturing into the dairy business. Nearly 60% of milk supplied to the pasteurization plants at Kohima and

Dimapur is produced by women farmers. The Dairy Plant at 7th Mile, Dimapur owned by Dimapur District Cooperative Producer's Ltd.(DIMUL), receives an average of 2080 litres daily from farmers for processing, packaging and marketing and has a sales turnover of 987.59 lakhs (2013-14) and 948.75 lakhs (2014-15) [Source: DIMUL Annual report 2014-15]. The department of Animal Veterinary and Animal Husbandry during the 12th year plan is also focusing on development of piggery for meat production and infusion of superior germplasm of Dairy Cattle for milk production which is being imported from USA so as to narrow down the gap between the demand and supply of Animal Husbandry products.

A field study was conducted covering all 11 districts of Nagaland with the help of a Questionnaire to get a rough idea of the dairy and piggery enterprise scenario in Nagaland. A total of 288 farmers/ respondents were included in the study out of which 33.3 % are dairy farmers and 66.7% are Piggery farmers. A district wise distribution also indicates more of piggery farmers. These farmers are mostly agriculturists and engaged in dairy and piggery sector as a secondary occupation (above 60%). The farmers prefer family assisted sole proprietorship with only 12.5% going for partnership in setting up and running their dairy and piggery enterprise whereas as less as 7.6% has taken up dairy and piggery farming in collaboration with Cooperatives/Self Help Groups/Non-governmental organizations. This is possible because the tribal people normally practice their secondary occupation on Family Owned land ie; more than 69%, with only 13.2% going for Leased/Rented land although this pattern is slowly reducing with urbanization. More than 50% of the farmers get their supply of sows/calves/boars/cows from individual farmers/entrepreneurs whose primary source are farms of other neighbouring states ie; imported. About 30% of the farmers procure them from traders while the rest from government agencies and other sources. As per the study, it is found that demand of pork meat is

very high whereas the demand for dairy products is at an average. Commercialization of the dairy and piggery sector is picking up in the state and this progressing trend is currently noticeable in Kohima, Dimapur, Wokha and Mokokchung. More than 80% of the respondents are of the opinion that dairy and piggery sector is indicative of positive growth and has good market prospects. They therefore, encouraged the educated unemployed to take up venture in these sectors. However, the farmers felt that the state government should also pay more attention to providing assistance to the high growth potential dairy and piggery enterprises.

As per survey, the dairy and piggery farmers indicated some major influences of their venturing/starting their dairy and piggery enterprises. The table 3.1 shows distribution of the factors by frequency and percentage taking into consideration a total of 288 respondents with the study encompassing all 11 districts of Nagaland.

Table 3.1: Distribution of Influencing Factors for Dairy and Piggery Ventures

District		Inheritance	No Govt. Job/Other stable job	Self-employment	Assistance from Govt.	Profit in the sector	Personal reasons / Others	Total
Dimapur	Frequency	6	4	16	1	17	1	45
	Percent	13.3	8.9	35.6	2.2	37.8	2.2	100
Kohima	Frequency	4	11	10	1	14	5	45
	Percent	8.9	24.4	22.2	2.2	31.1	11.1	100

Mon	Frequency	2	1	12		1	4	20
	Percent	10	5	60		5	20	100
Tuensang	Frequency	9	2	4		2	3	20
	Percent	45	10	20		10	15	100
Mokokchung	Frequency	6	5	4		2	3	20
	Percent	30	25	20		10	15	100
Wokha	Frequency	4	7	2			7	20
	Percent	20	35	10			35	100
Phek	Frequency	10	4	10	1	6	7	38
	Percent	26.3	10.5	26.3	2.6	15.8	18.4	100
Zunheboto	Frequency	9	3	3	1	3	1	20
	Percent	45	15	15	5	15	5	100
Peren	Frequency		1	18		1		20
	Percent		5	90		5		100
Kiphire	Frequency	4	5	3		7	1	20
	Percent	20	25	15		35	5	100
Longleng	Frequency	8	1	3		6	2	20
	Percent	40	5	15		30	10	100
Total	Frequency	62	44	85	4	59	34	288
	Percent	21.53	15.28	29.51	1.39	20.49	11.81	100

Source : Sample Survey.

As per table 3.1:

- 21.53% of respondents started their dairy/piggery enterprise on account of inheriting land/livestock and considers inheritance as the main factor in their decision to pursue the venture.
- 15.28% considered their greatest impetus towards the dairy/piggery ventures to be the non-availability of government jobs that invariably translates to non-availability of a stable income source or in some cases capital/resource scrunch thus making dairy & piggery their most viable economic option.
- The urge of self-employment and increase in unemployment of the state makes up for 29.51% and is the highest influencing factor for naga farmers to start dairy/piggery ventures.
- Attractive schemes or assistance programmes provided by the government (in the form of subsidies, piglets/calves, monetary assistance, health assistance) was found to consists of only 1.3% of total factors influencing farmer's decision.
- Awareness of considerable profit and returns generation, market viability of the dairy and piggery sector is increasing with increase in business minded approach and knowledge 20.49% .
- Personal reasons/Others constitute 11.81% of influencing factors.

ASSESSMENT OF SUPPORT FACILITIES/INPUT REQUIREMENT:

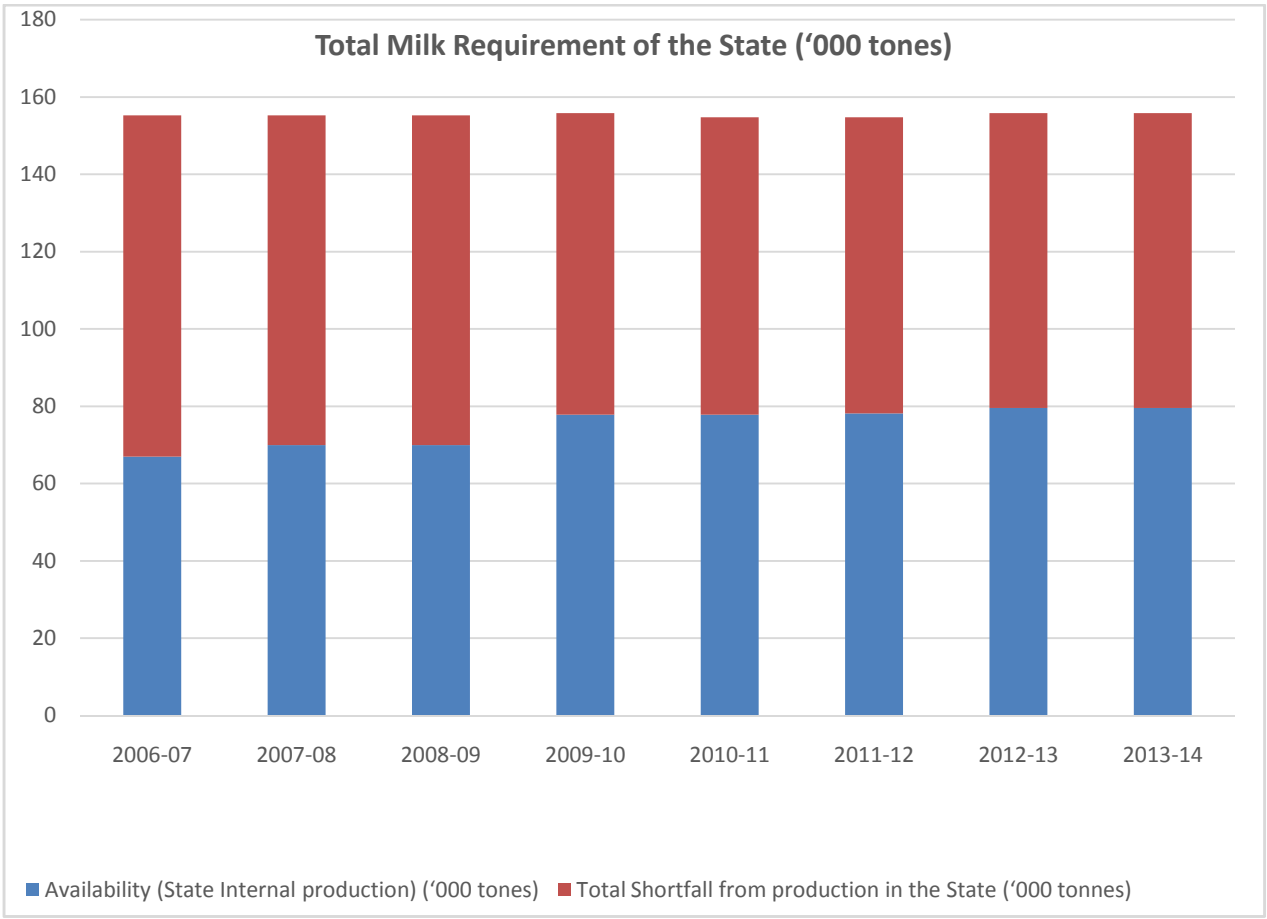
Cattle & Piggery Development and Market:

The State Cattle breeding Farms are producing quality heifers for breeding and propagation for the farmers. High yielding crossbred cattle like Holstein and Jersey are being produced for dissemination to the dairy farmers. Besides, the milk produced from these farms are fed to the Milk Plants for

processing and value addition. During 2013-14, infrastructure development particularly for strengthening of farms in Jalukie, Aliba and Tuensang under NABARD is in progress. However, the demand far outweighs the supply in the state and there is still a long way to go before the State can be self-sufficient. The huge shortfall from demand is imported from other states of the country, particularly the neighbouring states. In Nagaland, local and doom pig are reared for both meat and piglet production. Growth of local pig is slow and grows not more than 45kg in 8-12 months. So farmers are more interested in rearing cross breed and Hampshire breed. With regard to imports, one critical point to consider is that the method of pig rearing/cattle rearing at source points such as Uttar Pradesh, as findings by an independent study reveals, is not technologically superior and much less hygienic as the pigs are left out to scavenge for food, thus reducing the farmer's production cost immensely. Besides losing out on revenue generation sources to importers, this raises the question of quality of meat imported and the public health implications. The practice of pig rearing or backyard piggery is not new to the Nagas. Even if local production were to increase, importer's pricing would pose a stiff competition and local farmers will continue to be at a disadvantage. This scenario is not helping the State's economy: the influx of "cheap" imported pigs is killing local production and affecting livelihood opportunities for local people. Without pork and dairy import substitution policies with stronger tariff barriers by the State Government, there would be lesser incentive for local production to move up to the next level. As per latest data from Department of Veterinary and Animal husbandry of Nagaland, in 2013-14 year period there is a shortfall of 48.62% and 49.48% against the total requirement of meat and milk in State's internal production. The shortfalls are met with imports from other states of India and Myanmar. Many imports are not documented for Tax evasions. This contributes to the slow economic growth of the state. The representation of market trend of total

availability and shortfall of milk and meat in the state based on the State's requirement is given below for analysis.

Figure 3.1: Trend of Growth of Total Availability of Milk in the State based in reference to the Total Requirement and Shortfall.

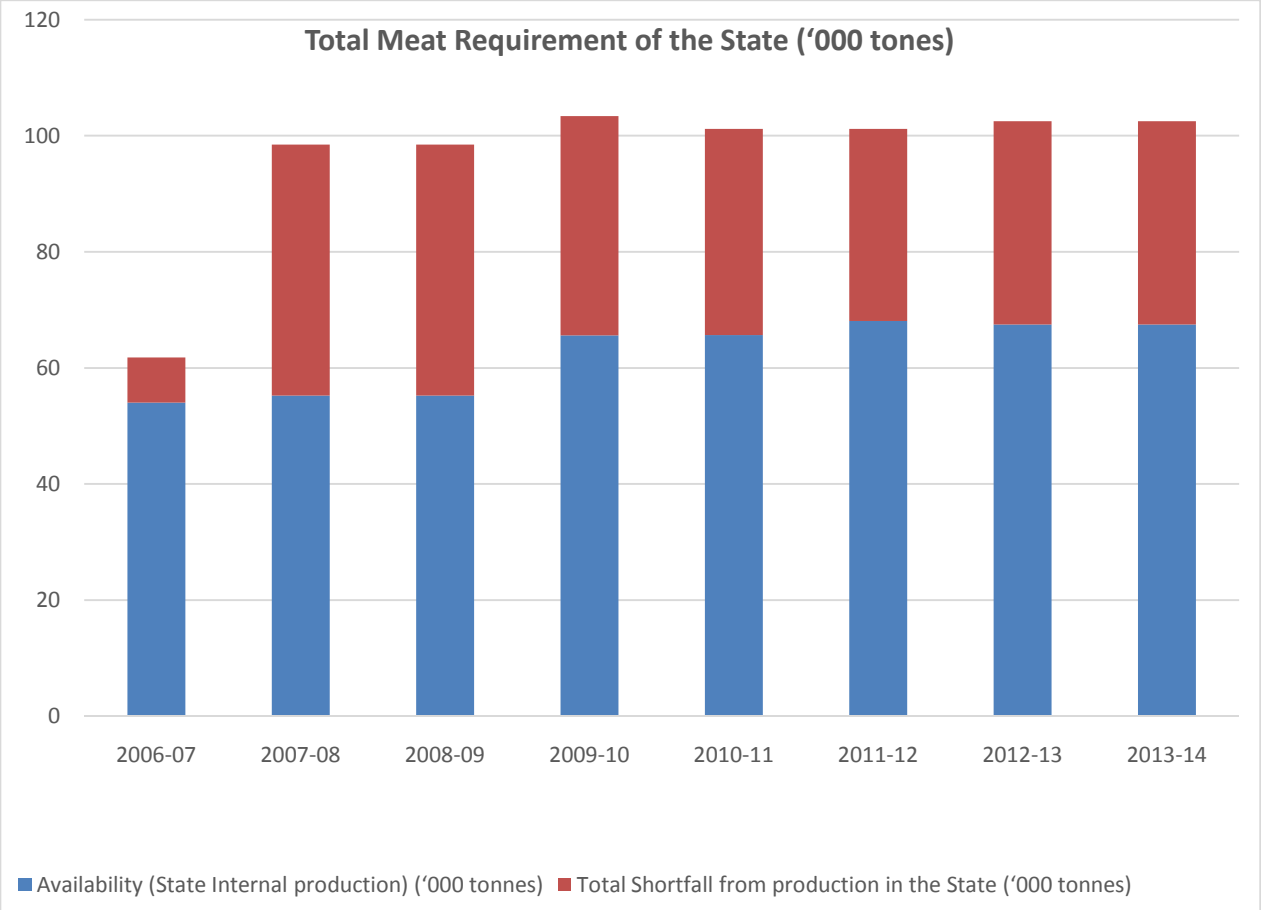


Source: Department of Veterinary and Animal Husbandry, Government of Nagaland.

The full length bars indicate the total requirement of milk in the state in a particular year in ('000 tonnes), colour coded to show the trend of growth of availability from state's internal production (blue coloured part) and the total shortfall remaining on account (red coloured part). From the chart, it is shown that there is still a huge difference between the requirement and availability of milk in the state. The shortfall of required milk of the state is more than the availability from internal production until 2009-10 year period after which the

internal production shows a slight increase from 2010-11. However, as seen in the chart there is still huge gap between requirement and availability and this shortfall is met with imports from other states amounting to `62.36 crores. This has huge negative impact on the economy of the state.

Figure 3.2: Trend of Total Meat Requirement and Availability of Meat in the State based on the Requirement.



Source: Department of Veterinary and Animal Husbandry, Government of Nagaland.

The bars indicate the total requirement of meat of the state in a particular year in ('000 tonnes) which shows an increase from around 60,000 tonnes in 2006-07 to more than 100,000 tonnes in the consequent years. Meat requirement is projected to continue on the increasing trend. In Nagaland about 60% of total meat requirement is met by pork meat. Blue colour coded

portion of the bar shows the availability from the state's internal production and the total shortfall remaining from production of the state is indicated by red colour. From the chart, we can make out that there is still a huge difference between the requirement and availability of meat in the state. Requirement of meat saw a sharp increase in 2007-08 maintaining its huge demand thereafter. Nagaland's tribal population is mostly meat eaters and thus meat demand is slated to increase further. As is the case of milk, shortfall of required meat too is met with imports from other states amounting to `148.94 crores for the most recent year period 2012-13 which in turn stalls the economic stability and development of the state. Huge import takes away money from the state.

Animal Health and Veterinary services:

Regular monitoring of health status of animals is necessary for progressive growth of animal husbandry. In order to ensure healthy herd status, steps towards an effective and efficient animal disease prevention and control notwithstanding the welfare norms is essential. Measures should be undertaken to keep the animals free from diseases and it is important to strictly adhere to vaccination and deworming programme for growth in production. Proper isolation/putting down and treatment of sick animals is requisite. Taking preventive measures for infectious and zoonotic diseases is most important in keeping with the huge number of livestock being imported from out of state to meet the demand supply difference. Most of the diseases effecting livestock is being reported in Nagaland due to unrestricted trades (where the condition of primary source farms is mostly unknown), use of unscreened semen for artificial insemination and poor farm hygienic conditions posing direct threat to dairy farmers, veterinarians, butchers etc. These diseases common among which are gastrointestinal parasitic infection, brucellosis, mastitis, coccidiosis, are of considerable economic importance causing chronic production losses as a result of advanced mortality, reduced

weight gain, weight loss, reduced milk/meat production etc. Thus, a complete and holistic approach towards good husbandry practices have to be focused on which includes general hygiene, health and nutrition. A large infrastructure in terms of veterinary hospitals/veterinary aid centres has been created and trained veterinary manpower is available but much less than required. The department has established 11 veterinary hospitals, 23 dispensaries, 130 Veterinary Health centers and 19 functional Quarantine Checkpost's as per Statistical Handbook of Nagaland'2014. These institutions provide veterinary services and consultancy to the farmers and livestock owners both in urban and rural areas. They also help in taking preventive measures through immunisation for controlling specific diseases. These Health institutions provide both clinical medicine and surgical treatment supported with pathological, microbiological and parasitological services which is attached to all the hospitals. To extend better health care services, Dispensaries and Veterinary Aid Centres have been established at convenient locations and are manned by suitable technical staff. More new dispensaries and hospitals are being established to serve the people better and assist them in taking care of their animals thereby preventing spread of zoonotic and other diseases and economic losses through livestock mortality. Spread of awareness of animal health requirements and adoption of loan for timely animal health as managemental measures is paramount.

Feeding Practices & Feed Input:

Fodder and feeds affect the form of profitability of the farm. The major constraint in dairy and piggery was identified in lack of adequate feed (quantity and quality) to sustain milk production, particularly during the dry season and bring about full growth potential of the pigs. Large quantities of crop residues are produced and can be harvested for dry-season feeding of lactating and in-calf cows. However, crop residues are of low quality and cannot satisfy the nutritional requirements of the cattle. Production and sale of

balanced feed is few and does not reach the remote rural area farmers, in Nagaland. Hay, fodder grass/trees and wild vegetables are gathered using human labour and the deficit in feed and fodder sometimes even results in imports, leading to reduction of profit in the animal husbandry sector. Pigs, in our country are mostly reared on kitchen and human waste and it is the same scenario in Nagaland whereas feed for cattle is usually procured from fields and forests by the farmers in the form of paddy/maize stalks, grasses, fodder trees, shrubs etc. utilizing human labour. Another difference in feeding would be that for pigs their feed is first cooked whereas cattle usually devour their feed directly. With deforestation, source of procurement of natural feed is becoming farther away from the place of production and thus gives rise to more resource input financially and in terms of human resource too. Uncultivated, barren and fallow lands should be developed for animal feeds (grasses, ago-forestry, pasture etc.) on priority. The feeding practice followed for cattle/buffalo in the state is grazing/stall feeding while for pig the most common practice is sty feeding. Unlike other parts of India, scavenging system of feeding by pigs is not permitted in Nagaland. Most of the farmers follow stall/sty feeding and rarely few farmers in remote villages follow scavenging system in an enclosure area along with morning and evening ration. Production of exotic and superior germplasm of pig, buffalo, sheep, goat, rabbit, poultry, etc. for farmers/ entrepreneurs from the department farms is the main mandate of the Department. Until the 9th Plan period, the department maintained such farms mainly for demonstration purposes with little production. However, from the 10th Plan the Department has changed its strategy by converting the demonstration farms into breeding and production farms to cater the demand of farmers and entrepreneurs. Besides, the Department had set up processing and value addition plants (ie. Dairy Plants) where ever surpluses are being produced. These developmental impacts had prompted the Departmental farms to increase the capacity two folds.

Therefore, to continue breeding and production in the State owned farms, concentrated feed items like maize, Mustard oil Cake/Ground Nut Cake, wheat bran, broken rice, rice polish, etc. are being procured. During 2010-11, an amount of `157.00 lakhs was spent and in 2011-12 an amount of `150.00 lakhs is earmarked for the same.

An amount of `19.00 lakhs is being earmarked for procurement seeds and agri-tools for fodder development as follows:-

Table 3.2: Expenditure Plan Earmarked for Fodder Development for 2011-12 by Department of Veterinary and AH.

Sl. No.	Particulars	2011-12 (` In Lakhs)
1	Procurement of Feed	150.00
2	Fodder Production (Seed & Agri. tools)	19.00
Total		**169**

Source: Department of Veterinary and Animal Husbandry, Government of Nagaland.

Table 3.3: Feeding Practices and Feed used of Dairy and Piggery Enterprises, State of Nagaland.

Type of Animal	Feeding practices	Feeds
Cattle	Grazing and Stall feeding	Dry fodder, Green fodder, Vegetables, Silage, Balanced feed and concentrates
Buffalo	Grazing and Stall feeding	Dry fodder, Green fodder, Vegetables, Silage, Balanced feed and concentrates
Pig	Sty Feeding	Kitchen waste, Vegetables, Silage, Dry fish, Balanced feed and concentrates

Source: Department of Veterinary and Animal Husbandry, Government of Nagaland.

Breeding-Artificial Insemination:

High yielding crossbreed cattle like Holstein & Jersey are being produced for dissemination. The State Veterinary and Animal Husbandry department during 2007-08 had inducted high milking germplasm of Cattle/Buffalo in the State especially to those Cooperative Societies/ Farmers who have already federated with the State Dairy Federation so that they produce surplus milk for processing. Growth of local breed of pig is slow and economically less superior to crossbreed. Recently, the Department of Veterinary and Animal Husbandry had introduced new germplasm of Hampshire and Large Black which was procured from outside the state to produce quality piglets. Considering the ever-increasing demand of pork and milk in the state and in order to meet the demand, learning the methods of Artificial Insemination (AI) is important so that productivity could be enhanced to cope up the demand and meet self-sufficiency. Artificial insemination is the process by which the hygienically collected and quality assurance semen from elite male is deposited in the female reproductive tract during estrus period (heat period-ovulation normally occurs toward the end of estrus). A clear understanding about procedures or steps involved in AI is very much for its utilization and propagation extensively. It is a safe and cheap method of introducing new genes of minimal disease, top performing and high health status into the herd and reduces risk of introducing exotic diseases. It also brings immense opportunities in overcoming the deficiency of breeding boar/cows and help in promotion of establishing small holder breeding unit for meeting the demand of quality pig germplasm. AI technique could be beneficial for meeting the demand of improved pig/cow germplasm at farmers' door step and help in faster propagation of elite germplasm. AI training is conducted for awareness and skill sets improvement and these trained AI workers are provided with avenues for part-time employment. The NSDCF Ltd. started implementation of the Centrally sponsored Scheme

called National Project on Cattle and Buffalo Breeding (NPCBB) beginning 2002-03 aiming to provide improved delivery system of reaching frozen semen AI services to the farmer's doorstep through trained private AI workers based on cost recovery approach.

The following tables shows the list of cattle and piggery breeding farms in Nagaland set up for development of the Dairy and Piggery sectors:-

Table 3.4: Cattle Breeding Farms in Nagaland:

SL. NO.	LOCATION
1	Medziphema, Dimapur
2	Aliba
3	Tuensang
4	Jalukie, Peren
5	Lerie, Kohima

Source: Department of Veterinary and Animal Husbandry, Government of Nagaland.

Table 3.5: Pig Breeding Farms in Nagaland:

SL. NO.	LOCATION
1	PBC Phek
2	PBC Tuensang
3	PBC Satbhazou
4	PBC Wokha
5	PBC Jalukie
6	PBC Merangkong
7	PBC Akuluto
8	PBC Tizit
9	PBC Medziphema
10	PBC Lerie, Kohima

Source: Department of Veterinary and Animal Husbandry, Government of Nagaland.

Table 3.6: Distribution of Artificial Insemination Centers in Nagaland in 2012-13.

District	District Artificial Insemination Center	Regional Artificial Insemination Center
Kohima	1	
Mokokchung		1
Tuensang	1	
Wokha	1	
Zunheboto		
Phek	1	
Mon	1	
Dimapur	1	
Peren		
Kiphire		
Longleng		
Total	6	1

Source: Statistical Handbook of Nagaland, 2014.

Grazing Land:

In Nagaland; traditionally, animals are not put to work except in far flung areas. The sole purpose of rearing animals is production of meat, milk and other by-products to supplement the farmer's income or slaughtered for local consumption after attaining certain growth levels. Free grazing is practiced in all community lands. There are hardly any specified grazing lands, but the farmers take their animals for grazing to nearby green pastures or woods following Naga's traditional practice and one/more workers stay in the grazing area to take care of the cattle bringing them back to the village/owner's yards after grazing. The general carrying capacity of forests as indicated by the Forests Research Institute, Dehradun is 60 cow unit per 100 hectares where 1 buffalo equals 2 cow units with regard to grazing. The Forest Survey of India's inventories indicate that due to restricted grazing, more than 50% of forests land in Nagaland are subject to grazing which is feared to eventually lead to rapid degradation of its forest resources. Feed requirement in Nagaland is fulfilled by dry fodder which consists of hay and

other dried wild fodder grass/plants, green fodder consisting of fresh vegetables, fodder plants which can either be cultivated or gathered from the jungle, rice, tuberous roots, maize, fruits and concentrates which includes marketed balanced feed, cakes and barn.

Transportation:

The Dairy and Piggery farmers usually use local transport contractors as part timers to transport their produce from the area of production to the market but sale/distribution is preferably localized as high transport cost reduces profit margin. Transport companies/contractors kept on full time retainers/paid transport managers are very rare for dairy/piggery sector in the state. Milk collected at DCS/WDCS after quality test conducted are transported to dairy plants. Milk Union/Federation collects the milk through its procurement vans following specific daily schedule under different milk routes. Trucks/Tata mobiles/closed vans are the usual transport vehicles used for the dairy and piggery enterprises. Moreover, far flung areas usually have poor road connectivity creating complications in the form of cost and transportation leading to hindrances in their regular to and fro movement of their produce.

PRODUCTS OF DAIRY AND PIGGERY ENTERPRISES-ITS PROCESSING:

DAIRY SECTOR:

Dairy development in the Country received an impetus after Independence when industrialization and public awakening necessitated the establishment of organized collection, processing and distribution of milk to cater to the needs of expanding urban areas. One of the major milk schemes included in the country's planned development was the "Greater Bombay Milk Scheme". In order to solve the problems of marketing, schemes were

taken up in some of the major cities, at the initial stages, through which arrangements were made to supply the milk produced in rural areas to the dairy plants and for distribution of the same to the consumers (in urban areas) after processing and packaging. Due consideration was paid to dairy development in different five year plans. Several schemes were taken up for establishments of liquid milk plants, creameries, milk products and cheese factories, expansion of salvage and fodder farms, cattle feed compounding factories and training of personnel for management and quality control. To bring about genetic improvement of milk yielding potentialities of cattle, key village blocks, intensive cattle development projects and frozen semen stations were established in various states and union territories.

Since inception, the dairy development activities in the state have been geared up on a mission mode through creation of basic Milk Processing infrastructure with the assistance from Government of India and the State Government. A new state-of-art Dairy Plant of 10000 litres capacity at Kohima is equipped with UHT (Ultra High Temperature) Plant and Milk product manufacturing unit for Lassi, Paneer and Yogurt under the Brand name “MILKCON” which stands for Milk Co-Operatives of Nagaland. Nagaland has been featured in the Dairy Map of India largely through the implementation of centrally sponsored scheme on “Intensive Dairy Development Project”.

Dairy by-products:

During the manufacture of dairy products, there invariably arises the problem of the utilization of by-products. Because of their great and unique nutritional value, the most rational method of utilization from the standpoint of general welfare is in food products. Usually it is the most profitable method as well, though non food by products are also produced . A dairy by-product is a product of commercial value produced during the manufacture of a main dairy product. It has been realized that economic disposal of by-

products is an essential prerequisite to profitable dairying . In recent times there has been widespread and increasing interest throughout the world in creating newer channels of utilization for the by-products of the dairy industry, though this trend is slow/yet to catch up in Nagaland or for that matter in greater India.

Dairy products produced in Nagaland:

The important dairy products in Nagaland are given below:-

Pasteurized toned milk:

Milk is an almost ideal food. It has a high nutritive value and is an important food for all ages. However, milk can be a potential carrier of disease producing microorganisms. Pasteurization involves heating the milk to a desirable temperature and immediately cooled, to kill all the disease borne microorganisms to render safe for human consumption.

UHT (Ultra High Temperature) milk:

Ultra High Temperature (UHT) treatment is a continuous process of heating milk at high temperature, designed to destroy all microorganisms. UHT processing, combined with aseptic packaging results in long shelf life of milk without refrigeration.

Yogurt:

Yogurt is one of the most popular and nutritive fermented milk product in the world. Consumption of yogurt is said to be beneficial for digestive system, heart diseases, arteriosclerosis, hypertension and chronic inflammation of liver.

Lassi:

Lassi is a popular dairy drink. It is consumed as a refreshing therapeutic summer beverage to guard against sun stroke.

Paneer (Vacuum Packed):

Paneer is an indigenous coagulated dairy product used mainly as an ingredient of cooking. It enjoys the status of a national delicacy.

Ice cream:

Different variants of ice-cream is being produced with milk as its base. They are popular and in huge demand among the urban populace.

The Nagaland State Dairy Co-Operative Federation Ltd. was set up as an apex body for dairy development in 2002. From then on, dairy development activities and establishment of infrastructural requirement is seen in almost all district head quarters to facilitate milk procurement and Marketing Avenue for dairy farmers. The details of current operational dairy and related infrastructure and their locations under NSDCF ltd. are given in **UNIT II Table 2.6**

PIGGERY SECTOR:

Meat Production and consumption has increased remarkably in recent years. The demand for quality meat and meat products is ever increasing due to growing awareness about nutritional and palatability characteristics of meat products as well as a sense of satiety arising from eating. Increasing purchasing power, changing socio-economic status and life styles have also contributed for the enhanced consumption of processed and convenience meat products. Meat processing refers to any treatment which brings about substantial physical and chemical changes in the natural state of meat.

In broadest sense; this includes grinding, smoking, cooking, canning, freezing, fermentation, dehydration, production of intermediate moisture products and use of certain additives such as seasoning, chemicals and enzymes etc. In processing, the inherent quality of fresh meat gets modified but the inherent quality of “being meat” remains intact. Processing aids to

produce value added, variety and convenience meat products to meat lifestyle requirements. It helps in better utilization of different-carcasses, cuts and edible byproducts. It facilitates incorporation of non-meat ingredients for quality and economy.

The State imported about 19.20 (000 tonnes) of meat during 2009-10, out of which 60% accounted for pigs i.e. 11.52 (000 tonnes). In view of this, the Nagaland State Govt. had outlined its policies to give main thrust to piggery development and production along with poultry. Absence of religious taboo coupled with inherent tradition in rearing of pig resulted in pork being the preferred choice of meat amongst the Nagas. Piggery Development has taken a new chapter after the introduction of exotic pigs by the Veterinary and Animal Husbandry Department. The production & reproduction traits of this animal have convinced the piggery farmers to take up piggery as a source of income generation. Therefore, the Department with a view to propagate and disseminate crossbred piglets to the farmers for production had set up 10 (ten) nos. of State Pig Breeding Farms which is producing Hampshire and Yorkshire crosses. The capacity of the farm ranges from 30-60 sows / unit only and with such a low capacity it is far from inadequate for which import and price of pork in the State is correspondingly increasing. Thus, to enhance the capacities of these farms the Department under Negotiated Loan had strengthened the infrastructure of 9 (nine) nos. of Breeding Farms, raising the capacity of the farms ranging between 60-120 sows unit and is likely to provide the much needed piglets to the farmers.

Further, the Veterinary and Animal Husbandry Department has initiated setting up of Nagaland Pig Composite Farms with Nucleus farms for Parent Stock and a Slaughter house which will be managed by a Management Company including satellite breeding farms owned by the farmers. This shall be done on Public Private Partnership. The main aim of the project shall be to produce sufficient piglets for pork production through hygienic slaughtering

& processing. Accordingly, land acquisition & surveying were done and DPR preparation was completed. Thus; to implement this mega project, an amount of `1000.00 lakhs was spent as state matching share under Special Plan Assistance during 2010-11 & in 2011-12, the Department proposes to spent `150.00 lakhs for the project. Besides, with the strengthening of Pig Breeding Farms under NABARD, it is proposed to procure foundation stock especially Hampshire / Large White Yorkshire from outside the state during 2011-12 for which an amount of `25.00 lakhs is being earmarked for stock procurement for setting up of one Artificial Insemination Lab. at Kohima along with requisite appliances with a view to produce quality piglets through AI as follows:-

Table 3.7: Project particulars under Special Plan Assistance.

Sl. No.	**Particulars**	**2011-12** (`. in lakhs)
1	Procurement of Pigs & AI lab.	25.00
2	Nagaland Composite Pig Farm	150.00
	Total	**175.00**

Source: Department of Veterinary and Animal Husbandry, Government of Nagaland.

Piggery products produced in Nagaland:

Pork meat:

Nagaland is known to have one of the highest consumers of pork meat in India. In Nagaland, live pigs are slaughtered in nearby slaughter houses/areas by the butchers themselves and fresh pork meat sold in their nearby shops/stalls. It is normally sold together with bones/innards. One can buy any specified part of the pig for a higher sum.

Pig Fat:

Pig fat in Nagaland is also sold separately by itself. It is usually rendered down to lard and used as accompaniment in dishes for flavor or as cooking oil.

Blood:

Blood of the pig is collected separately during slaughter and is in high demand in Nagaland. It is considered a delicacy and various types of dishes can be prepared with the blood.

Sausages:

Local sausage is usually formed in a casing traditionally made from intestine filled with ground pork meat. Small quantity of packaged or processed sausages is also available.

Pork Pickle:

Pork pickle is usually spicy fried shredded pork meat with added preservatives and usually sold packaged in plastic/glass containers.

Manure:

Pig rearing is usually associated with cultivation. Manure collected in pig farms are a great source of fertilizer for cultivation. In urban areas pig manure is also sold by bags and used for floriculture and in kitchen gardens.

VALUE ADDITIONAL PERSPECTIVES OF DAIRY & PIGGERY SECTOR IN NAGALAND:

The following items have immense potentials and perspectives in the state;

DAIRY SECTOR:

- Lassi
- Dahi
- Ghee
- Curd
- Ice-Cream
- Paneer

PIGGERY SECTOR:

- Sausages
- Salami
- Hotdog
- Hamburger
- Ham
- Pickle

Other by-products like hide, bone, blood, liver, pancreases, pelt/fur, manure etc; can be exploited on commercial basis, provided organized slaughter house is set up in each district.

MARKET STRUCTURE AND MARKETING CHANNEL:

Nagaland has no proper market linkage in the rural areas and the farmers practice direct selling of both milk and pork meat. The livestock produce is usually consumed locally and the sale price of products varies depending on remoteness of the locality. Traditionally, rearing of pig for meat was practiced in Nagaland and eventually pattern of production surplus for

economic supplement began to be followed. In regards to milk, availability and consumption is low, as keeping dairy animals among the naga tribals was not common and they were owned/reared by well to do people for domestic consumption. Commercialization of milk and its products is a very recent development and has just started to take ground. At the moment, milk and pork meat are among the essential commodities in the state.

Tables 3.8 and 3.9 gives the latest price levels of milk and pork meat demands in the market and shows their economic worth in the state:-

Table 3.8: District-Wise Average Retail Price of Milk and Pork Meat For the Year 2013.

District	Milk/ 1 ltr. (In Lakhs)	Pork Meat/kg. (In Lakhs)
Kohima	33.75	153.75
Mokokchung	38.33	155.00
Tuensang	39.09	162.50
Wokha	31.50	157.50
Zunheboto	38.75	162.50
Phek	30.42	158.33
Mon	39.33	157.50
Dimapur	30.00	152.50
Peren	30.00	164.17
Kiphire	40.00	160.00
Longleng	40.00	163.13

Source: Statistical Handbook of Nagaland’2014.

Table 3.9: Current (2014-15) Average Wholesale and Retail Price of Milk and Poek Meat in the State.

Product	Wholesale (In Rupees)	Retail (In Rupees)
Milk (per litre)	40	44
Local Pork (per kg)	200	220
Imported Pork (per kg)	160	180

Source : Sample survey.

DAIRY ENTERPRISES:

Milk and its products are generally not easily marketable commodities and long distance movement of these products is not feasible. For want of quick transport and marketing facilities, milk is marketed in nearby areas and as such does not provide sufficient income to the farmers. Therefore, until recently it was not an attractive enterprise to invest in. Inadequacy of suitable marketing structure was one of the main inhibiting factors for milk production. Final marketing of milk and milk products to the consumers in the organized sector are through authorized dealers and retailers and the milk is collected in bulk by Milk Unions/Federations. Whereas, in the unorganized sector, mostly direct selling to the customer is practiced. With the formation of Milk Unions in Nagaland, marketing needs of farmers of some areas have been addressed significantly as the Milk Unions organize DCS in prospective villages, where milk is collected from the farmers and removes the middlemen from the marketing channel, thus assuring them ready market at remunerative price. In Nagaland, there currently exists 2 market structure in the dairy sector viz: Traditional Unorganized market and Organized market.

Unorganized Market :

This type of market exists mostly within a certain locality/area. The following figure shows the marketing channel of Unorganized market Dairy enterprises in Nagaland.

Figure 3: 3(i) & (ii): Marketing Channel of Unorganized Market.

(i)

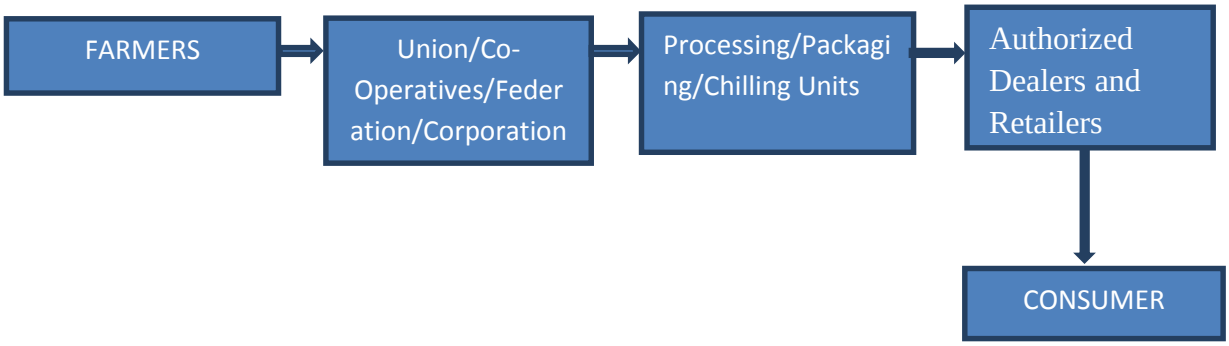
(ii)

Source: Field Survey.

Organized Market:

Organized market of Nagaland is dominated by the State assisted Milk Union's , Federations and Co-operatives. Private enterprises are few and far between. The following figure shows the marketing channel of Organized market Dairy enterprises in Nagaland.

Figure 3:4: Marketing Channel of Organized Market.

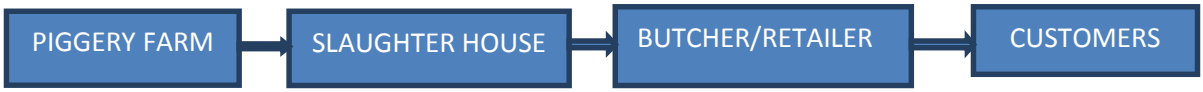


Source: Field Survey.

PIGGERY ENTERPRISES:

In Nagaland, the primary purpose for piggery enterprise is pork meat production. By-products like lard, bristles, pickle, sausages, etc. are also produced in small quantities but usually by local entrepreneurs/Self Help Groups who get their stock of pork meat from the butchers. There is no set rules or organized structure of piggery sector and butchers usually have their own piggery farms. They breed their produce or procure their pigs for slaughter individually from specific piggery farms with which they deal on a regular basis also from suppliers who brings in imported pigs.. There are currently no specific processing/packaging plant and no major retailer for piggery sector products. The few that are in circulation are by the home based local entrepreneurs. There is huge deficiency for commercialized infrastructural requirement of piggery sector and very few processed/packaged products are available. Here, the butchers themselves slaughter the pig and sell their fresh pork meat in their shops/stalls. In the state, there is only one organized slaughter house, ie. in Mokokchung. Private sectors slaughter houses are set up by the butchers usually in areas near their pork shops. Thus, the marketing channel of piggery sector in Nagaland comprises of very few steps. The following figure shows the marketing channel of Piggery enterprises in Nagaland.

Figure 3.5: Marketing Channel of Piggery Enterprise.



Source: Field Survey.

PROMOTION AND DISTRIBUTION:

The processing and marketing/distribution of milk and milk products are carried out at present by three types of organization viz. private, semi-government and cooperatives. The private sector has mostly limited its activities to high margin western type dairy products. This sector utilizes very little of the profits into milk-production-enhancement programmes. Milk marketing is still dominated by private traders with an average of less than 10% of total milk being marketed by organized sector. Majority of the liquid milk plants in the country are owned and operated by government/semi-government organizations. Government also owns and operates certain factories for manufacturing milk products. In the third system; the processing and marketing organization is owned and operated by district level unions formed by primary village level milk producers, cooperative societies. This system ensures that the producers get the largest share of profits derived from consumers from traders or middlemen. In Nagaland, milk production and per capita availability is very low. However, the culture of consuming milk is new and therefore the demand which was also low is rising steadily. Indigenous breed cattle have low yield as compared to cross-breed. Farmers can procure their animals from out of state or central breeding farms or NGO's at subsidized rate. Organized dairying has started in a small way. A majority of Nagaland's (over 20 lakhs) people take pork as part of a traditional diet; the demand is unlikely to decrease yet. Nagaland State's pork market is dependent on supply from outside as the local production level is insufficient to meet the demand. Several factors are deterring local farmers from producing enough for domestic consumption; one factor is the pricing of supply pork against which local farmers are unable to compete. At present, the retail price of local pork is not less than `200 / Kg whereas, strangely, 'Supply Pork' costs around `180 / Kg. Moreover, the more remote an area is from distribution hubs, like Dimapur and Mokokchung, the higher the price.

This is due to logistical costs involved, which applies to prices of all imported fresh food items. This shows that people with lower incomes, living in remote areas of Nagaland, with poor transport connectivity and with lesser income opportunities, are doubly disadvantaged. Consumers are relatively aware that Supply Pork is of lower quality and therefore prefer local pork; however, price and availability become dominating influences on their buying decision, especially for those with lower disposable incomes – who comprise the highest percentage of the Naga public. In Nagaland, dairy and pig production system is still in a small-scale and is an unorganized rural activity, as part of diversified agriculture with the majority of farmers dependent on rearing of low performing indigenous pigs.

Given below are tables to show the different methods dairy and piggery farmers use for the distribution of market promotional activity of their products and the methods employed by them to distribute their products as per study encompassing all the 11 districts of Nagaland.

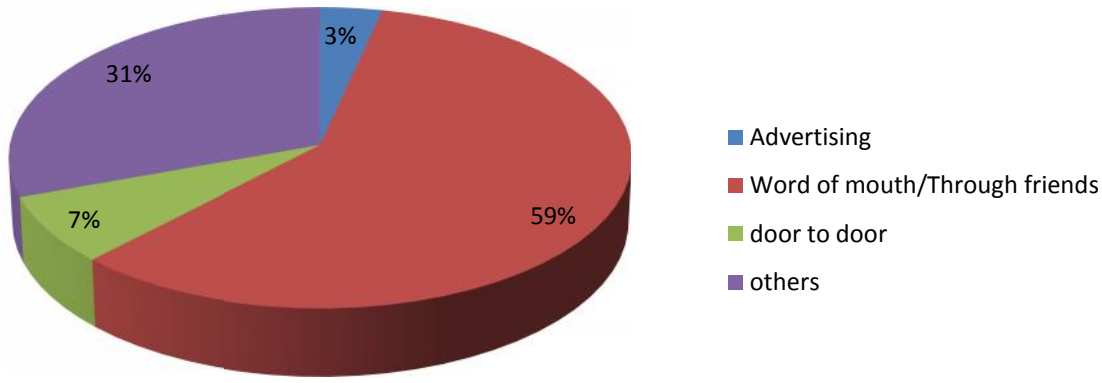
Table 3.10: Distribution of Market Promotional Activity in all 11 Districts of Nagaland.

District		Advertising	word of mouth/friends	door to door	others	Total
Dimapur	Frequency	3	22	7	13	45
	Percent	6.7	48.9	15.6	28.9	100.0
Kohima	Frequency	4	13	2	26	45
	Percent	8.9	28.9	4.4	57.8	100.0
Mon	Frequency		13		7	20
	Percent		65.0		35.0	100.0

Tuensang	Frequency	1	14	1	4	20
	Percent	5.0	70.0	5.0	20.0	100.0
Mokokchung	Frequency	1	2	2	15	20
	Percent	5.0	10.0	10.0	75.0	100.0
Wokha	Frequency		10		10	20
	Percent		50.0		50.0	100.0
Phek	Frequency		25	3	10	38
	Percent		65.8	7.9	26.3	100.0
Zunheboto	Frequency		17	2	1	20
	Percent		85.0	10.0	5.0	100.0
Peren	Frequency		19		1	20
	Percent		95.0		5.0	100.0
Kiphire	Frequency	1	15	3	1	20
	Percent	5.0	75.0	15.0	5.0	100.0
Longleng	Frequency		19	1		20
	Percent		95.0	5.0		100.0
Total	**Frequency**	**10**	**169**	**21**	**88**	**288**
	Percent	**3.5**	**58.7**	**7.3**	**30.6**	**100.0**

Source : Sample survey.

Fig 3.6: Distribution of Market Promotional Activity in Nagaland



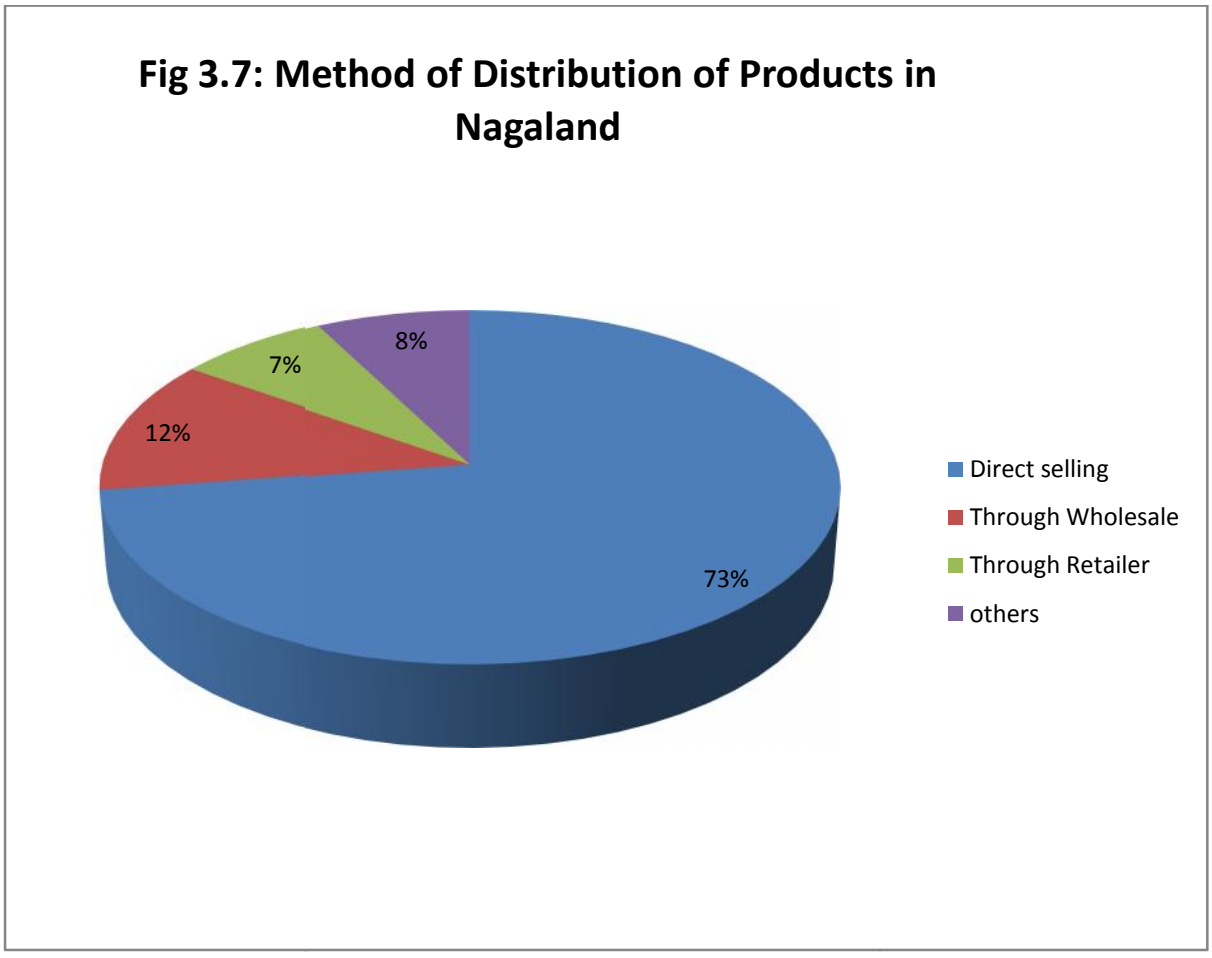
For easy understanding a pie chart is used to show the overall distribution of market promotional activity that the dairy and piggery enterprise of Nagaland depends on for promotional marketing of their products. It includes the total data collected from all 11 districts within the state of Nagaland. The study shows that use of organized paid advertising of products is rare ie; less than 5%. Similarly, time consuming intensive labour requirement of door to door promotion consists of less than 8%. The bulk of about 60% of the dairy and piggery enterprises in Nagaland mostly depend on word of mouth/ friends and about 30% on other unconventional localized means for promoting their products in the market.

Table 3.11: Method of Distribution of Products in all 11 Districts within the State of Nagaland.

District		Direct Selling	through Wholesale	through retailer	others	Total
Dimapur	Frequency	29	7	5	4	45
	Percent	64.4	15.6	11.1	8.9	100.0
Kohima	Frequency	24	8	5	8	45
	Percent	53.3	17.8	11.1	17.8	100.0
Mon	Frequency	18		2		20
	Percent	90.0		10.0		100.0
Tuensang	Frequency	18	1	1		20
	Percent	90.0	5.0	5.0		100.0
Mokokchung	Frequency	11	4	1	4	20
	Percent	55.0	20.0	5.0	20.0	100.0
Wokha	Frequency	10	9		1	20
	Percent	50.0	45.0		5.0	100.0
Phek	Frequency	29	2	5	2	38
	Percent	76.3	5.3	13.2	5.3	100.0
Zunheboto	Frequency	16	2	1	1	20
	Percent	80.0	10.0	5.0	5.0	100.0
Peren	Frequency	19			1	20
	Percent	95.0			5.0	100.0
Kiphire	Frequency	15	2	2	1	20

	Percent	75.0	10.0	10.0	5.0	100.0
Longleng	Frequency	20				20
	Percent	100.0				100.0
Total	**Frequency**	**209**	**35**	**22**	**22**	**288**
	Percent	**72.6**	**12.2**	**7.6**	**7.6**	**100.0**

Source : Sample Survey.



As per the above figure, 72.6% of farmers distribute their products through direct selling followed by 12.2% through wholesale. Equal percentage of farmers use retailers and other localized avenues as their distribution channel. Most of the enterprise owners as seen in the survey prefer direct selling to the customers and are yet to embrace the organized

sector though the trend is slowly changing, with farmers realizing the benefits of more organized management chain of selling their products and the market prospects.

The supply of improved breed/High Yielding variety of cattle/pigs are inadequate in the state and are bought from out of state which results in high capital input mostly on account of transportation cost. Deficit requirement of milking or fattened pigs are procured from other states or in some cases even imported from other countries which dents the economy of the state and hampers growth and development of the state's Dairy and Piggery enterprises. As per the study conducted, major support/input facilities for the enterprises include (i) Cattle & Piggery Development and Market (ii) Breeding-Artificial Insemination (iii) Feeding Practices & Feed Input (iv) Grazing (v) Land and (vi) Transportation. The farmers face constraints due to non-availability of medicine/vaccines/equipments in the veterinary hospitals and dispensaries. There is also issue of inadequate veterinary services mostly due to lack of veterinary infrastructure and medical personnel in the state. There is no organized market structure and lack of infrastructural support for dairy and piggery sectors. The marketing channel is either very simple, comprising of only the producer and customer or very complex with a large number of middlemen; thus, reducing the profit margin of the grass-root producers. Majority of the farmers still use traditional unconventional localized means for promotion and distribution of their products. Increasing unemployment in the State among the educated youths of the State has been a subject of great concern in the absence of any organized industry in the State. Findings of the study suggests that the main factors influencing the entrepreneurs/farmers to venture into dairy and piggery farming is the urge for self employment and the unavailability of a stable source of income which makes up about 45%, followed by inheritance- farm enterprise at 22%. On the positive side, 22% of the remaining influencing factors for farmers to start ventures in the sectors

under study is found to be as a result of the pull factor of the dairy/piggery sector which includes Government/NGO's assistance, expansion of knowledge base of the progressive farmers, increasing awareness of considerable profit and returns generation and market viability of the dairy and piggery enterprises. Livestock farming, particularly of dairy animals and pigs, in a scientific and profitable way is an emerging sector which can play a vital role in encouraging entrepreneurship and self employment among the youths of the state.

CHAPTER IV

ROLE OF DAIRY AND PIGGERY ENTERPRISES AND THEIR IMPACT ON RURAL ECONOMY OF NAGALAND (A COMPARATIVE STUDY WITH A NEIGHBOURING STATE LIKE MEGHALAYA)

Animal husbandry is an integral component of Indian agriculture supporting livelihood of more than two-thirds of the rural population. Animals provide nutrient-rich food products, draught power, dung as organic manure and domestic fuel, hides & skin, and are a regular source of cash income for rural households. They are a natural capital, which can be easily reproduced to act as a living bank with offspring as interest, and an insurance against income shocks of crop failure and natural calamities. Driven by the structural changes in agriculture and food consumption patterns, the utility of livestock has been undergoing a steady transformation. Their importance as a source of quality food has increased. Sustained income and economic growth, a fast-growing urban population, burgeoning middle-income class, changing lifestyles, increasing proportion of women in workforce, improvements in transportation and storage practices and rise of supermarkets; especially in cities and towns are fuelling rapid increases in consumption of animal food products.

ROLE IN THE ECONOMY:

In India, the livestock sector alone contributes nearly 25.6% of Value of Output at current prices of total value of output in Agriculture, Fishing & Forestry sector. The overall contribution of Livestock Sector in total GDP is nearly 4.11%at current prices during 2012-13. Between 1983 and 2004, the share of animal products in the total food expenditure increased from 21.8% to 25.0% in urban areas and from 16.1% to 21.4% in rural areas. Demand for animal food products is responsive to income changes, and is expected to increase in future. Between 1991-92 and 2008-09, India's per capita income grew at an annual rate of 4.8% and urban population at a rate of 2.5%.These trends are likely to continue. By the end of 12th Plan demand, for milk is expected to increase to 141 million tonnes and for meat, eggs and fish together to15.8 million tonnes. Global market for animal products is

expanding fast, and is an opportunity for India to improve its participation in global market. Livestock sector grew at an annual rate of 5.3% during 1980s, 3.9% during 1990s and 3.6% during 2000s. Despite deceleration, growth in livestock sector remained about 1.5 times larger than in the crop sector which implies its critical role in cushioning agricultural growth. Distribution of livestock is more equitable than that of land. In 2003, marginal farm households (≤1.0h hectare of land) who comprised 48% of the rural households controlled more than half of country's cattle and buffalo and two-thirds of small animals and poultry as against 24% of land. Between 1991-92 and 2002-03 their share in land area increased by 9 percentage points and in different livestock species by 10-25 percentage points. The share of agricultural sector in GDP declined from 34% in 1981-82 to 15% in 2010-11. The share of livestock in GDP also declined but not as steep as the share of agricultural sector. It remained between 5-6% until 2000-01 and then gradually declined to 3.9% in 2010-11. Nonetheless, the share of livestock in the agricultural GDP improved consistently from 15% in 1981-82 to 26% in 2010-11. Animal Husbandry is the science of taking care of livestock/ domestic animals that are used primarily as food or product sources. Animal husbandry is fast changing the economy of rural agrarian society and in turn contributing significantly in state economy. Dairy & Piggery are among the most profitable animal husbandry enterprises.

It is a given that households whose primary occupation was self-employment in agriculture would like to maximize their income by pursuing agricultural and allied activities. They also gained comparative advantage of experience, skills and availability of agricultural by-products for livestock as feed and fodder. Livestock production is an important activity in Nagaland's agriculture based rural areas and have helped to provide employment and income generation for farmers, rural poor and weaker sections. It is poised for revolution in developing countries where major increase in milk and meat are

anticipated. Nagaland has a rural population of more than 70% (as per 2011 census) who are mostly agriculturists. Their mode of agriculture is subsistence agriculture and animal husbandry plays a huge role in their sustenance and income generation. Agriculture being dependent on seasons and weather conditions, the farmers need an additional means of support to fall back on. Animal Husbandry generate immense employment potential in the field of livestock rearing, livestock produce processing and marketing. Animal Husbandry is fast changing the economy of rural agrarian society and in turn contributing significantly to state economy. Man and Animal association is continuing since time immemorial and man has used animals both for food and food production. Animals provide a diverse range of output varying from draught for cultivation, irrigation, transport; to fiber and leather goods, to manure as fertilizer and fuel; to self-employment throughout the year, as well as by direct production of milk, meat and eggs for human consumption. It is a well-known fact that for a sustainable development in any sector, there must be a definite policy so that a systematic approach can be made in the right direction. The policy so adopted should be concomitant with the policy framed for the country as a whole. Considering the above factor, the department of A.H. & Veterinary of both Nagaland and Meghalaya has taken up various programmes for an overall development in this sector with special reference to the economic growth of the state as a whole. As per available report, India ranks 1st in milk production in the world. In Meghalaya, the total milk production has gone up from 42 thousand tonnes in 1972-74 to 66 thousand tonnes at the end of the Ninth Plan period. It has been worked out that the per capita availability of milk in the state is only 75 grams which is far below the all India level. The main reason is that, the people of both Nagaland and Meghalaya, especially in the rural areas are not in the habit of drinking milk and as such the people of the state were not inclined to milk production in earlier days. The main agricultural activity of farmers in

the Northeast is the mixed crop system- livestock system characterized with low inputs and outputs. Livestock is an important component of mixed farming system due to preference of meat in the diets of the people of the region. The area is also known as the meat consuming zone of India. There are no social taboos in taking any type of meat but the most preferred meat is pork, followed by beef, chicken and others. Consumption of milk and milk products is lower in these parts in comparison to the rest of the country. Livestock; specially pig and poultry, is a key livelihood among the farming rural families and provides food for consumption, sources of income and capital and socio-cultural needs. All the North-Eastern states are highly dependent on imports to meet their demand for eggs, fish, meat and milk. Thus, for both meat, milk and milk products, the dairy and piggery sector is undoubtedly of major importance for rural livelihoods and poverty alleviation both at household and the state levels.

There is great scope for dairy & piggery development in North Eastern Region as the people living in North Eastern Region consume maximum amount of animal protein as compared to the people living in other regions of the country. The traditional subsistence level of Animal Husbandry is fast changing as Animal Husbandry industry provides increased economic stability to the poor masses and households activity as cash buffer in case of small stock, and a captive reserve in case of larger stock. Commercialization of various livestock sectors has become necessary and is expected to grow rapidly to augment the food requirement of ever increasing world population. With 80% of the primary sector of production i.e. the agriculture sector being found in rural areas, any potentiality in growth will improve the rural economy and has a positive effect. Both dairy and piggery enterprises offer tremendous scope for rural development as it is suitable to the poor farmers for earning subsidiary income, besides using milk and meat for home consumption and requires minimum investment. Pig is an efficient converter

of feed into pork which has high nutritional value in human diet and a dairy animal not only provide milk but is a major source of meat for the north easterners. Pigs utilize waste products like table garbage, bakery waste, hotel and kitchen waste, unmarketable vegetables and fruits very efficiently. Pig farming can also be successfully combined with dairy or other agricultural activities. Moreover, pigs have two farrowing per year with a litter of size ranging from 6 – 12 piglets on an average. It has immense potential for sustainable food production for the increasing human population of our Country. Among the various livestock species, piggery is the most potential source of meat production and is quite cost effective. It has high potential of manure and bio-gas production. Dairy and Piggery farming are enterprises that requires less capital and its growth can serve the state by income and employment generation, food security, overall nutrition, poverty elimination and social upliftment. The demand for meat and dairy products in India is very high. With the rapid population growth, this demand will undoubtedly increase further and is eventually expected to exceed production. This will create lucrative opportunities for the dairy and Piggery sector. The growth potential is huge but it requires a radical systematic change in the way business is conducted and managed. Incorporation of modern mechanization and automation to supplement the existing family based system of animal husbandry in the state has to be employed for more efficient and higher productivity. Large potential also exists for excess production to supplement exports thus contributing positively to the State's economy and the rural economy in particular.

Studying the market and enhancing livestock rearing to meet local needs as well as meat processing infrastructure were the primary aspirations of the department of Veterinary & Animal Husbandry of Nagaland. And sure enough, livestock rearing continues to be another key economic factor of Nagaland which includes fishery, animal husbandry, cattle farming, piggery

and poultry. During the end of the 10th Plan, production was worth `230 crores. As per sample survey report of 2007 – 2008, the state produced only 60.9% of the net domestic product. The balance 39.10% , which is about `220 crores in monetary terms is imported from outside the state. Import of meat and meat products not only increases the cost of food but also results in outflow of resources. In the absence of any recognized industry in the State, Animal Husbandry and Dairy alone can absorb a large fraction of unemployed youth in the State. The dairy and piggery farming lead to better utilization of land and human resources. It is considered to be the land saving enterprise as compared to the production of crops. A survey conducted by National Dairy Research Institute (NDRI) Karnal showed that three adult crossbred cows and their progeny could be maintained on one acre of land. The per lactation milk yield of these crossbreed cows of Karan-Swiss bred was at least 3000 litres. The net income from this mini dairy unit was calculated to be far more than net returns from one acre of land under any crop in a single year. The large size dairy and piggery farming on commercial lines has potential of providing large employment avenues, while small size farming acts as a subsidiary occupation to landless agricultural labourers, small and marginal farmers. They fit well in mixed farming system to provide continuous income to the farmers during their lean period and also helps to engage their family working population profitably throughout the year. They are indispensable for the upliftment of the rural economy. Hence, the Government programmes to overcome poverty in rural areas have increasingly turned to dairy and piggery farming. The approach of mass production of animal husbandry products in the State through 'people's participation' has been adopted so as to attain self-sufficiency in the production of meat, milk and eggs. In addition, efforts for revival and improvement of the traditional 'backyard livestock' farming are being made. Production through 'cluster approach' to ensure effective monitoring and

success of schemes and marketing are of primary importance as it will result in surplus commodity for value addition thus increasing the positive aspects of venturing into the dairy and piggery enterprise sector.

A COMPARATIVE ANALYSIS AND DISCUSSION BETWEEN THE STATES OF NAGALAND AND MEGHALAYA:

Livestock Census in our country started in the year 1919 and since then, the process has been continuing on Quinquennial basis with the latest livestock Census undertaken in the year 2012. Livestock Census is a Quinquennial complete enumeration process whereby data on livestock along with their characteristic details are generated. The conduct of livestock census is essential for making plans and policies for growth of livestock sector and also for overall growth of the economy. In 19th Livestock Census (2012), 37.28% were cattle, 21.23% buffaloes, and 2.01% pigs. The corresponding figures as per the 18th Livestock Census (2007) were 37.58%, 19.89% and 2.10%. Data from the State's Department of Animal Husbandry and Veterinary and the nation's livestock census have been used to assess the position of the state in relation to the country in general. Data study of a neighbouring similar topographical state of Meghalaya has also been included to study the state's proportion of milk producing animals and pigs. Livestock's share in the value of output of agriculture and allied activities is about 30% in north eastern states of Nagaland and Meghalaya. The scenario of dairy and piggery sector in the neighbouring state of Meghalaya has been taken. It gives an overview of comparison with Nagaland to determine the productivity trends and variation in the yield rate with relation to a similar agriculturally based, hilly terrain, geographically and social-economically similar competent state to help put into perspective required changes to

necessitate immediate revival of the rural economy of the state via the enterprises under study. Help of data intensive tables/charts and figures have been utilized to make a comprehensive comparison between the Dairy and Piggery sectors of Nagaland and Meghalaya.

Table 4.1: All India livestock Population with the Percentage Change in Growth or Decline from 2007-2012 Census.

Year	Animal Species (in Million numbers)			Total Livestock (in Million nos.)
	Cattle	Buffalo	Pigs	
2007	199.08	105.34	11.13	529.7
2012	190.90	108.70	10.29	512.06
Percentage Change	**-4.11**	**3.19**	**-7.54**	**-3.33**

Source: 19th Livestock Census of India 2012.

The Total Livestock of India shows a decreasing trend of -3.33% from 2007 to 2012. Total population of cattle and Pigs also shows a decreased percentage change of -4.11 and 7.54 respectively. The only increase in population in 2012 census in respect to 2007 census for the animal species under study is shown by buffaloes to the tune of +3.19%.

Table 4.2: Livestock Population in Nagaland and Meghalaya with Numbers for both Rural and Urban Areas.

State	Rural	Urban	Total
Meghalaya	1951969	5658	**1957627**
Nagaland	806071	105091	**911162**

Source: 19th Livestock Census of India 2012.

Data from 19th Livestock shows that without doubt majority of the livestock population of both Nagaland and Meghalaya are found in rural areas. This indicates that commercialization of Livestock is yet to gain popularity and most of the livestock farmers are rural people.

Table 4.3- Cattle, Buffaloes and Pigs Population 2012 Census and Growth Rate/Percentage change as compared to 2007 Census for:

(i) Nagaland and

(ii) Meghalaya

Table 4.3(i)a: Nagaland.

Sl. No	Species	Population (Numbers)			Total	Est. Growth Rate (%)
1	Catlle	Crossbred	Male	46106	128952	-49.23
			Female	82846		
		Indigenous	Male	41558	106022	-50.88
			Female	64464		
2	Buffalo	Indigenous	Male	15705	32720	-2.51
			Female	17015		
3	Pig	Exotic/ Crossbred	Male	202718	380719	-20.96
			Female	178001		
		Indigenous	Male	67676	122969	-48.18
			Female	55293		

Source: Basic Animal Husbandry & Fisheries Statistics - 2014 , Government of India.

Table 4.3 (i)b: Nagaland.

Year	Animal Species (in Thousand numbers)		
	Cattle	**Buffalo**	**Pigs**
18th Livestock Census, 2007	469.82	35.02	697.79
19th Livestock Census, 2012	234.97	32.72	503.69
Percentage Change	**-49. 99**	**-6.57**	**-38.54**

Source: 19th Livestock Census , Government of India 2012.

Table 4.3 (ii)a: Meghalaya.

Sl. No	Species	Population (Numbers)			Total	Est. Growth Rate (%)
1	Catlle	Crossbred	Male	8710	35247	31.28
			Female	26537		
		Indigenous	Male	347143	860753	0.04
			Female	513610		
2	Buffalo	Indigenous	Male	14460	22059	-6.57
			Female	7599		
3	Pig	Exotic/ Crossbred	Male	70029	133623	47.50
			Female	63594		
		Indigenous	Male	213067	543381	-9.78
			Female	196691		

Source: Basic Animal Husbandry & Fisheries Statistics - 2014 , Government of India.

Table 4.3 (ii)b: Meghalaya.

Year	Animal Species (in Thousand numbers)		
	Cattle	**Buffalo**	**Pigs**
18th Livestock Census, 2007	887.24	22.63	524.36
19th Livestock Census, 2012	896.00	22.06	543.38
Percentage Change	**0. 99**	**-2.51**	**3.50**

Source: 19th Livestock Census , Government of India 2012.

The above tables indicate that the trend of livestock population in Nagaland is discouraging- for all types of animals i.e. cattle, buffaloes and pigs, there has been a steep decreasing trend of growth. The percentage change of population growth for 2012 as compared to 2007 census is at a negative. The state of Meghalaya paints a better picture in relation to livestock growth from 2007 to 2012 and the percentage change for cattle and pigs though less, shows as being positive. However, the percentage for buffaloes for Meghalaya also stands at negative.

MILK PRODUCTION AND GROWTH:

Animals in milk mean the animal's who contribute towards production of milk. The total number of animals in milk in the country is 116.77 Million numbers. As per 19th Census (2012) Cattle contribute 57% of milk production and Buffaloes 31% of total milk production in the country. As per BAHS-2014 GOI, the annual growth rate of milk production for 5 year period between 2007 and 2012 census for the state of Nagaland and Meghalaya is 0.8% and 1.0% respectively. The requirement is high and increasing but the availability and growth of production has not been promising. For Dairy

development district level Milk Unions/Agencies have been set up in both Nagaland and Meghalaya for Procurement of milk from primary Coop. Societies, processing of milk and value added milk products, distribution and marketing. Also provision of inputs such as fodder development, cattle feed, artificial insemination, Veterinary & A.H. Aids, milk testing equipment and trainings. Below are the listed Milk Unions/Agencies:

Nagaland:

1. Dimapur District Cooperative Milk Producers' Union Ltd. (DIMUL)
2. Kohima District Cooperative Milk Producers' Union Ltd. (KOMUL) now operating under the brand name MILKCON.
3. Mokokchung District Cooperative Milk Producer's Union Ltd.

Meghalaya:

1. District Milk Procurement and Marketing Agency for Shillong Areas,
2. District Implementing Agency at Jaintia Hills District
3. District Society for Integrated Dairy Development Project (Megha) in Tura.

The following tables: Table 4.4 and Table 4.5, shows the district wise distribution of cattle and buffaloes for Nagaland and Meghalaya to provide an overview of area/district wise information about the available animals for milk production or the lack thereof. Also, a comprehensive comparison of milk production statistics for Nagaland and Meghalaya with that of the country's overall production is given.

Table 4.4: District-wise Livestock Population-Cattle & Buffaloes Nagaland, 2012.

Sl. No.	Name of District	Cattle		Total Cattle	Buffalo	Total Bovine
		Crossbred	Indigenous			
1	Mon	10957	14170	25127	6898	32025
2	Mokokchung	9967	284	10251	316	10567
3	Zunheboto	10406	15462	25868	254	26122
4	Wokha	12986	3568	16554	432	16986
5	Dimapur	32755	23395	56150	11597	67747
6	Phek	6319	8624	14943	3090	18033
7	Tuensang	19718	8121	27839	1064	28903
8	Longleng	3543	6275	9818	39	9857
9	Kiphire	4853	5997	10850	-	10850
10	Kohima	9666	9382	19048	1272	20320
11	Peren	2389	8456	10845	6489	17334
	State (Overall)	**123559**	**103734**	**227293**	**31451**	**258744**

Source: Veterinary and Animal Husbandry Department, Nagaland.

Table 4.5: District-wise Livestock Population-Cattle & Buffaloes Meghalaya, 2012.

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

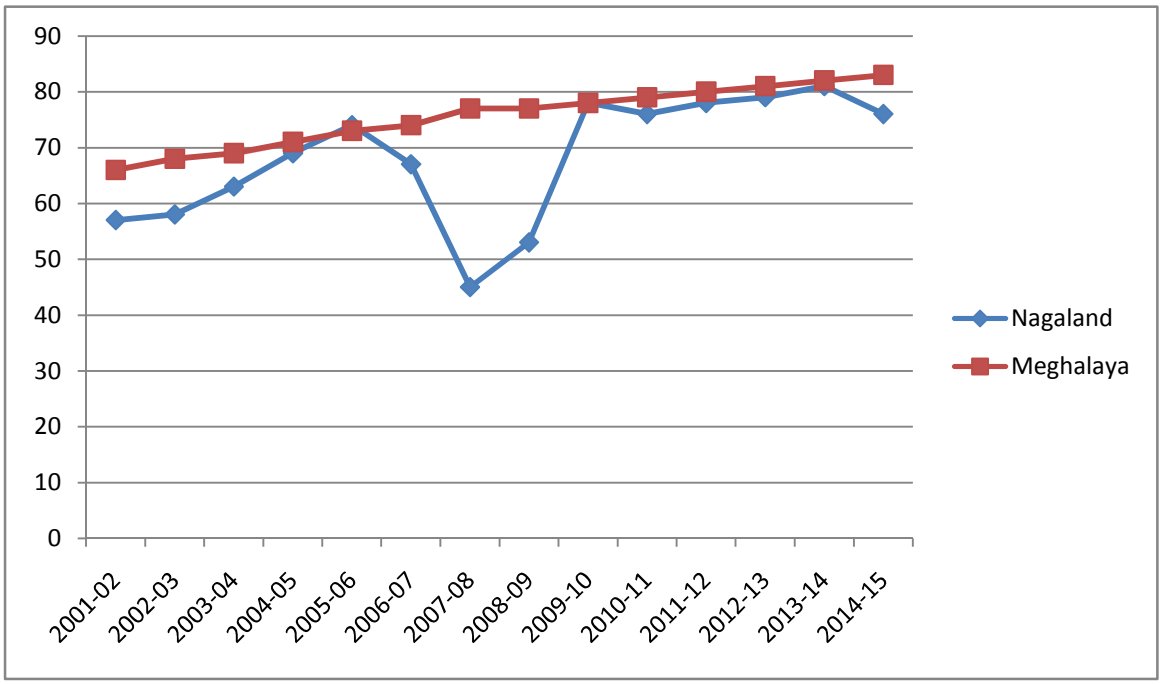
Source: Animal Husbandry and Veterinary Department, Meghalaya.

Table:4.6: Comprehensive Comparison of Milk Production Status of Nagaland and Meghalaya with the Country's Total from Year Period 2001-02 to 2014-15.

Milk Production (000 tonnes)			
Year Period	**All India**	**Nagaland**	**Meghalaya**
2001-02	84406	57	66
2002-03	86159	58	68
2003-04	88082	63	69
2004-05	92484	69	71
2005-06	97066	74	73
2006-07	102580	67	74
2007-08	107934	45	77
2008-09	112183	53	77
2009-10	116425	78	78
2010-11	121848	76	79
2011-12	127904	78	80
2012-13	132431	79	81
2013-14	137685	81	82
2014-15	146314	76	83

Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India.

Figure 4.1: Trend of Growth of Milk Production of Nagaland and Meghalaya.



As per the above table and graph, it is found that the production of milk for Nagaland fluctuates drastically in different year periods whereas Meghalaya shows a trend of steady growth rate in milk production for the entire study periods. For Nagaland production of milk rose sharply from 2002-03 year period to 2005-06 and started declining steeply till 2006-07, after which period there was another phase of rapid growth for two year periods 2007-08 & 2008-09. This was followed by slow steady growth with a declining trend being indicated again after 2013-14.

Table 4.7: Comparison of Per Capita Availability of Milk gm/day of the States of Nagaland and Meghalaya in Relation to the Total Per Capita Availability in the Country.

Year Period	All India	Nagaland	Meghalaya
2001-02	225	78	78
2002-03	230	78	78
2003-04	231	83	78
2004-05	233	90	81
2005-06	241	96	82
2006-07	251	86	81
2007-08	260	58	83
2008-09	266	67	83
2009-10	273	96	83
2010-11	281	93	83
2011-12	290	108	74
2012-13	299	94	83
2013-14	307	95	84

Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India.

Per capita availability is calculated based on State estimates of production and projected population as on 1st March, based on Census of India 2001 of Revenue generated index(RGI), India. The per capita availability of milk for India is increasing at an impressive rate. The state of Nagaland and Meghalaya in comparison are lagging behind with an enormous difference gap. However, data indicates a slow but steady rise in growth of per capita availability in the north eastern states. Growth rate is more steady for Meghalaya whereas Nagaland's growth rate shows uneven fluctuations.

To better understand the trend of production and availability, break-ups of animals under study for milk production is undertaken. The following tables 4.8 (i)(ii)(iii) shows the details of estimates of available data for milk production for Nagaland and Meghalaya from exotic / crossbreed cows, nondescript / indigenous cows and buffaloes during the year periods of 2008-09 to 2012-13.

4.8 (i): Estimates of Milk Production from Exotic/Crossbreed Cows during 2008-09 to 2012-13.

Year	No. of Animals in Milk (in 000)		Average Yield per Animal in Milk (in kg)		Estimates of Milk Production (000 tonnes)	
	Nagaland	Meghalaya	Nagaland	Meghalaya	Nagaland	Meghalaya
2008-09	23.60	14.4	4.87	8.95	41.94	47.04
2009-10	32.23	14.49	5.37	8.96	63.17	47.39
2010-11	33.06	14.6	5.18	8.98	62.48	47.87
2011-12	33.00	14.49	5.23	8.96	63.91	48.24
2012-13	33.38	14.68	5.30	8.98	62.48	48.12

4.8(ii): Estimates of Milk Production from Non Descript/ Indigenous Cows during 2008-09 to 2012-13.

Year	No. of Animals in Milk (in 000)		Average Yield per Animal in Milk (in kg)		Estimates of Milk Production (000 tonnes)	
	Nagaland	Meghalaya	Nagaland	Meghalaya	Nagaland	Meghalaya
2008-09	15.08	103.87	1.34	0.75	7.40	28.43
2009-10	14.40	104.73	1.87	0.75	9.83	28.67
2010-11	14.18	105.73	1.74	0.76	9.01	29.25
2011-12	14.00	106.54	1.86	0.76	9.60	29.25
2012-13	13.25	108.11	1.86	0.77	9.00	30.38

4.8(iii): Estimates of Milk Production from Buffaloes during 2008-09 to 2012-13.

Year	No. of Animals in Milk (in 000)		Average Yield per Animal in Milk (in kg)		Estimates of Milk Production (000 tonnes)	
	Nagaland	Meghalaya	Nagaland	Meghalaya	Nagaland	Meghalaya
2008-09	3.02	2.94	1.35	1.86	1.49	2.00
2009-10	3.32	2.96	3.35	1.85	4.06	2.00
2010-11	3.34	2.99	3.18	1.85	3.88	2.01
2011-12	3.00	3.01	3.40	1.84	3.94	2.03
2012-13	3.51	3.00	3.35	1.84	4.29	2.01

Source Tables 4.8 (i) (ii) & (iii): Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India.

From the above table 4.8(i),(ii) and (iii), it is observed that;

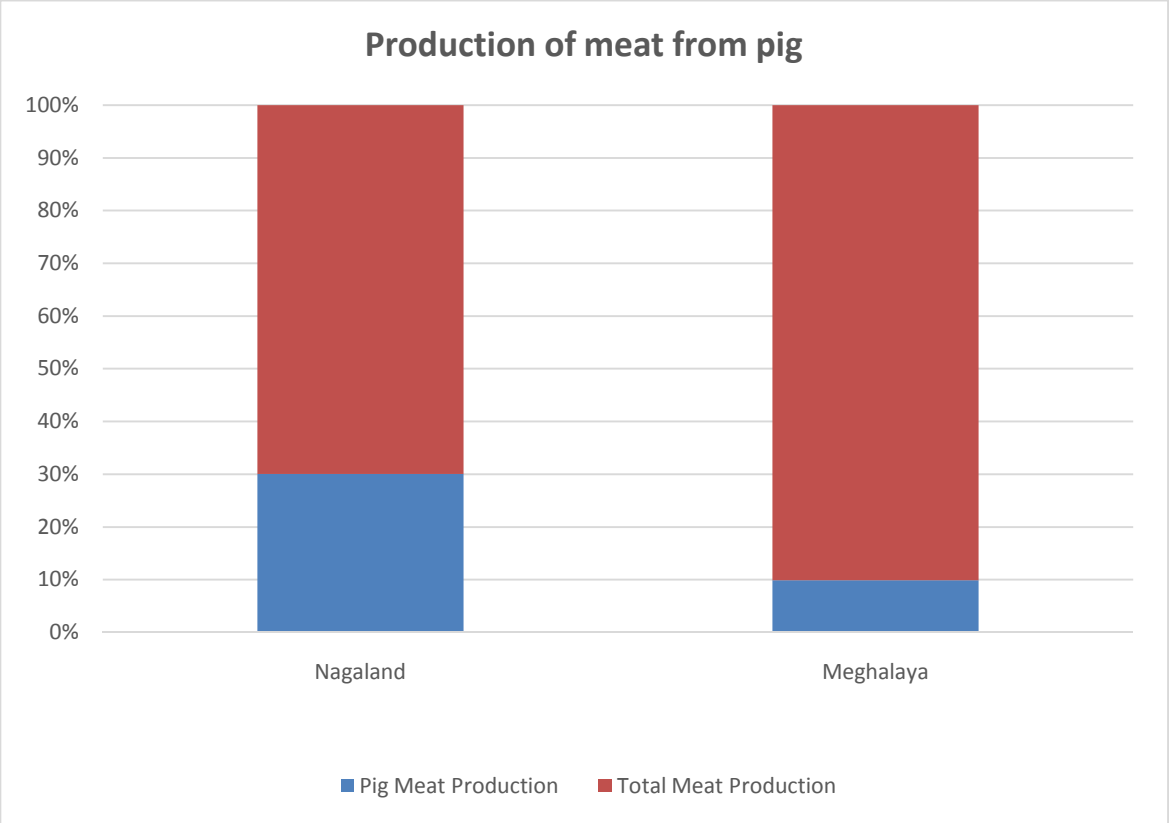
- The number of crossbreed cows in milk production is higher for Nagaland but the average yield per animal in milk(kg) is much higher for the state of Meghalaya. Meghalaya therefore shows a better milk production estimate considering the total number of cows.
- The total number of non descript/Indigenous cows in milk production for Nagaland is only around 12% compared to Meghalaya. However, the average yield per animal(in kg) for Nagaland is more than double the amount of Meghalaya. The estimated milk production of Meghalaya from Non descript/Indigenous cows is much higher than that of Nagaland on account of high population of the said breed of cows.
- Total number of buffaloes in milk production is higher for the state of Nagaland with average yield of milk per animal(kg) being almost 70% higher than the state of Meghalaya. Latest data shows that the estimated milk production in tonnes for Nagaland is double than that of Meghalaya.

PIG MEAT PRODUCTION AND GROWTH:

Pigs contributes around 2.01% of the total livestock population. The total number of Pigs in the country as per 2012 Census is 10.29 million numbers. The meat production shared by the north eastern states of Nagaland and Meghalaya to the country's total meat production is negligible at only 1.2% and 0.6% respectively. However, both the states have an agrarian economy with major thrust in animal husbandry for sustenance and leaning towards surplus commercial farming of animal husbandry thereby creating huge potential of growth in meat production. In India, the meat production from pig is highest in the State of Uttar Pradesh with 0.172 million tonnes per year. The second and third highest average production of meat is reported by Bihar and Nagaland respectively. The country's analysis shows that nearly 45% of the production of

meat is contributed by Poultry. Other livestock animals like Cattle, Buffalo, Sheep, Goat, Pig and Poultry contributes 19%, 16%, 8%, 7% and 5% of production of meat respectively. The Graph below shows the State wise variation in terms of production of meat from Pig to total meat production for Nagaland and Meghalaya.

Figure 4.2: Production of Meat from Pork in Relation to Total Production of Meat in the State of Nagaland and Meghalaya. i.e. Share of Pig Meat in State's Total Meat Production.



Source: Basic Animal Husbandry and Fisheries Statistics, India 2014.

As seen in figure, Pig meat contributes to 30% of total state's meat production for Nagaland whereas for the state of Meghalaya, the share of pig meat to total meat is only 10%.

Table 4.9: Share of Indigenous and Exotic/Crossbreed breeds to State's Total Pig Population.

State	Indigenous/non-descript	Exotic/Crossbred	Total
Nagaland	122969	380719	**503688**
Meghalaya	409758	133623	**543381**

Source: 19th livestock Status, Government of India.

The above table indicates that the piggery enterprises of Nagaland comprises of more than 70% of indigenous/non descript pig breed and less than 30% of exotic/Crossbreed pigs. However, preference of indigenous/non descript pig breed (75%) is higher in Meghalaya with crossbreed pigs making up less than 25% of total pig population of the state.

Table 4.10: Percentage Change of Pigs Population from 18th Livestock Census 2007 to 19th Census 2012.

State	Pigs						Percentage change (2007-2012)		
	Crossbreed		Indigenous		Total				
	2007	2012	2007	2012	2007	2012	Crossbreed	Indigenous	**Total**
Nagaland	461	381	237	123	314	277	-20.96	-48.18	**-38.54**
Meghalaya	70	134	454	410	524	543	47.50	-9.78	**3.50**

Source: 19th Livestock Census, Government of India.

Table 4.10 shows that the percentage change of pig population for 2012 in comparison to 2007 census stands at a negative of -38.54 for Nagaland. However, state of Meghalaya shows a positive trend of growth at 3.50% in 2012 compared to 2007.

Table 4.11 (i) & (ii): The following tables shows the district wise distribution of cattle and buffaloes for Nagaland and Meghalaya and provide an overview of area/district wise information about available pig population or lack thereof.

Table 4.11 (i): Nagaland District-wise Livestock Population- Pigs, 2012.

Sl. No.	Name of District	Pigs		Total Pigs
		Crossbred	Indigenous	
1	Mon	27949	18689	46638
2	Mokokchung	46040	-	46040
3	Zunheboto	38331	19028	57359
4	Wokha	33325	12388	45713
5	Dimapur	58253	10828	69081
6	Phek	37290	7041	44331
7	Tuensang	33040	22295	55335
8	Longleng	8226	3016	11242
9	Kiphire	26313	21267	47580
10	Kohima	46449	4970	51419
11	Peren	12503	3846	16349
	State (Overall)	**367719**	**123368**	**491087**

Source: Veterinary and Animal husbandry Department, Nagaland.

Table 4.11 (ii): Meghalaya District-wise Livestock Population- Pigs, 2012.

Sl. No.	Name of District	Pigs		Total Pigs
		Crossbred	Indigenous	
1	East Khasi Hills	53818	79011	132829
2	Ri – Bhoi	12596	17082	29678
3	West Khasi Hills	14123	43296	57419
4	South West Khasi Hills	7333	14764	22097
5	East Jaintia Hills	7262	17572	24834
6	West Jaintia Hills	14368	22744	37112
7	East Garo Hills	5547	38808	44355
8	North Garo Hills	6215	34331	40546
9	West Garo Hills	6055	96283	102338
10	South West Garo Hills	921	35333	36254
11	South Garo Hills	9746	32093	41839
	State (Overall)	137984	431317	569301

Source: Animal Husbandry and Veterinary Department, Meghalaya.

To better understand the trend of production and availability, Table 4.12, shows a comprehensive comparison of meat production for Nagaland and Meghalaya along with the total in the country for the year period 2008-09 to 2012-13. Also , in Table 4.13 the details of estimates of meat production from pig for Nagaland and Meghalaya is given with break ups for estimated number of animals slaughtered in the state during the same year periods with average annual yield of meat/animal in kg and the annual meat production in 000’ tonnes. Fig 4.3, shows the trend of meat production for both Nagaland in Meghalaya using a trend graph.

TABLE 4.12: Estimates of Total Meat Production during 2008-09 to 2012-13.

Meat Production (000' tonnes)			
Year Period	**All India**	**Nagaland**	**Meghalaya**
2008-09	4279.61	63.26	37.01
2009-10	4565.57	65.58	37.32
2010-11	4868.97	65.67	37.95
2011-12	5514.25	65.70	38.24
2012-13	5948.17	65.85	38.52

Source : Government of India and State Animal Husbandry Department.

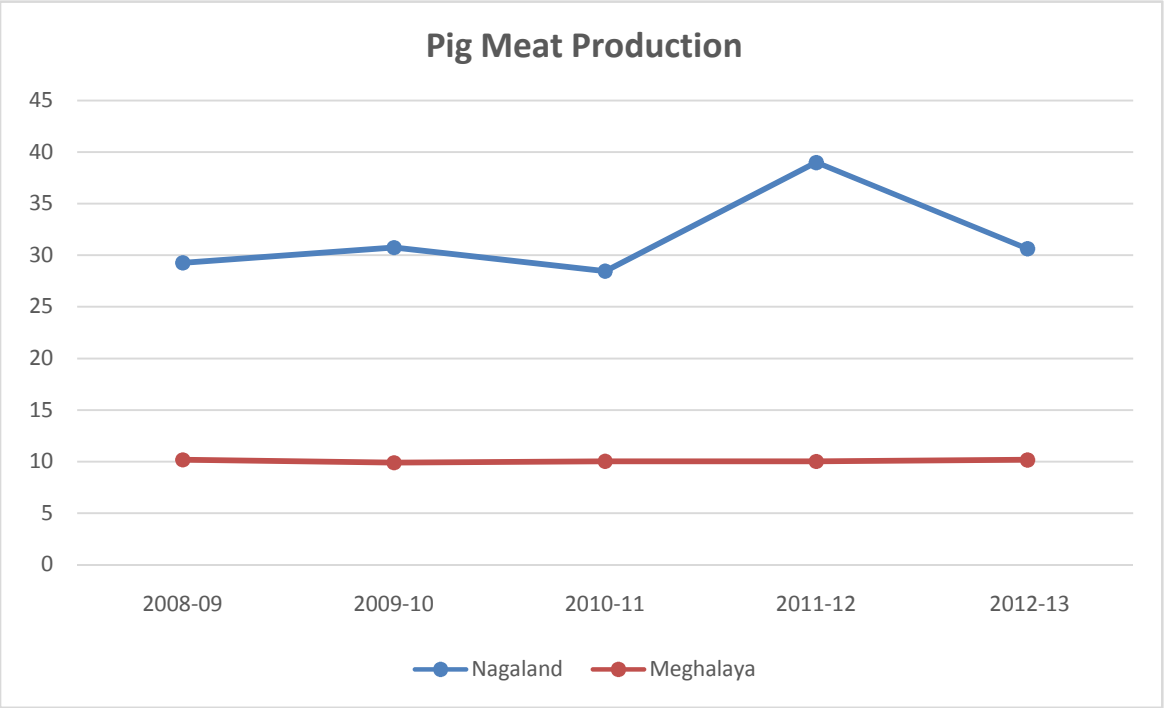
As per table; meat production for Nagaland shows an high increase till 2009-10 followed by slow and steady growth since 2011-12. Meghalaya shows a trend of slow but steady growth with average meat production growth of 367 tonnes annually for the year periods considered.

Table 4.13: Details of the Estimates of Meat Production from Pig during 2008-09 to 2012-13.

	Est. Number of animals Slaughtered (in 000)		Average Annual Yield / animal (in kg)		Meat Production (000 tonnes)	
Year	Nagaland	Meghalaya	Nagaland	Meghalaya	Nagaland	Meghalaya
2008-09	406.60	239.51	72.00	42.41	29.27	10.16
2009-10	426.92	232.78	72.00	42.48	30.74	9.89
2010-11	395.20	236.13	72.00	42.44	28.45	10.02
2011-12	543.00	238.00	72.00	42.00	39.00	10.00
2012-13	425.43	236.69	72.00	42.87	30.63	10.15

Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India.

Figure 4.3: Trend of Pig/Pork Meat Production in Nagaland and Meghalaya from 2008-2013.



Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India.

As per table 4.13 and graph Fig 4.3; it is found that the pig meat production for Nagaland has a fluctuating trend of alternating increase and decrease every other year. However for Meghalaya, the average annual growth, though slow is steady and shows promising growth trend.

VETERINARY HEALTH INSTITUTIONS:

Table 4.14 (i) & (ii) gives the details of total number of Veterinary Health Institutions and their district-wise distribution in Nagaland and Meghalaya.

Table 4.14(i): Nagaland.

Sl. No.	Name of District.	Particulars			
		Vety. Hospitals	Vety. Dispensaries	Vety. Health Centres	Quarantine Checkpost
1.	Kohima	1	5	21	1
2.	Dimapur	1	1	9	2
3.	Peren	1	1	9	1
4.	Wokha	1	3	17	-
5.	Zunheboto	1	2	24	1
6.	Mokokchung	1	1	14	3
7.	Tuensang	1	5	7	2
8.	Phek	1	3	13	2
9.	Mon	1	1	12	3
10.	Kiphire	1	1	2	4
11.	Longleng	1	-	2	-
Total		**11**	**23**	**130**	**19**

Source: Statistical handbook of Nagaland 2013, Directorate of Economics & Statistics Veterinary Hospitals.

Table 4.14(ii): Meghalaya.

Sl No	Name of District.	Particulars			
		Vety. Hospitals	Vety. Dispensaries	Vety. Aid Centres	Mobile Vety. Dispensaries
1	East Khasi Hills	1	22	12	2
2	Ri-Bhoi	-	15	2	1
3	West Khasi Hills	1	10	8	2
4	South West Khasi Hills		5	-	1
5	West Jaintia Hills	1	15	8	2
6	East Jaintia Hills	-	5	4	1
7	East Garo Hills	-	7	1	1
8	North Garo Hills	-	5	7	1
9	West Garo Hills	1	16	2	3
10	South West Garo Hills	-	7	1	-
11	South Garo Hills	-	6	5	1
	Total	**4**	**113**	**50**	**15**

Source: Animal Husbandry and Veterinary Department, Meghalaya.

The State government of respective states have endeavored to set up medical facilities to render veterinary services including preventive measures against specific and non-specific diseases including improving animal health and castration of animals. However, the current capacity of veterinary hospitals, dispensaries, aid centers and trained veterinary medical experts are not enough for the state's requirement and still lacking in modern

advancement for both Nagaland and Meghalaya. Upgrading of local stock; mainly through crossbreeding with high yield breeds and artificial insemination and encouraging more health intensive and hygienic practices of cattle and pig breeding has also been one of the main objectives for setting up veterinary infrastructures-though much improvement is still warranted.

The comprehensive comparison through collated data for the state of Nagaland and Meghalaya shows that growth rate and production of both milk and pig meat is very slow-hence indicates the snail pace of growth of dairy and piggery enterprises in the NE region. Though dairy and piggery are traditionally practiced animal husbandry activities, the general populace in these states are skeptical in starting up dairy and piggery enterprises as a primary occupation or on commercial level, because of unavailability of substantial state assistance and unorganized marketing and distributing channels thus increasing the amount of capital required. Hence, they are more comfortable with following the traditional backyard farming as for them the pull factor of the enterprises in study does not sufficiently override the constraints. As per assessment, the growth of both dairy and piggery sector shows a better and steadier growth for Meghalaya and the livestock population is also higher than Nagaland. Both enterprises under study has majority concentration in the rural areas for Nagaland and Meghalaya. The central and state government schemes for both states are similar but Meghalaya shows better management and implementation of the schemes for dairy and Piggery development. The growth of livestock sector has been found slower in the NER than at the national level. However, a significant proportion of landless labourers, small and marginal farmers have access to livestock resources and acceleration in the growth of livestock in NER though slow offers significant opportunities for household income augmentation and employment generation. In NER , because of social and religious acceptance, the consumption of meat is relatively higher in this region, and that of milk

and milk products is lower. Coupled with the traditional meat-eating habit, increasing per capita income, urbanization and changes in life-style, the region is deficit in production of livestock products. In NER the percentage share of crossbreed cattle and pigs are abysmally low compared to other states of the country. The indigenous pigs are small and low carcass yielder, while the crossbred pigs grow fast and produce high carcass. According to 19th livestock census data, about 54% of population of cattle and 70% of population of pigs in Nagaland were crossbred. However, due to knowledge, feed, health and other constraints full potential of capacity is rarely realized from them leading to low yield. In Meghalaya, only 3% of cattle and 25% of pigs were found to be crossbreed though the crossbreed population is slowly witnessing an increased trend. On account of increase in demand arising from high population growth and income, the indigenous pigs are being replaced gradually by crossbred pigs in most of the NE states. However, the tribal people's preference for indigenous pig meat over crossbred and the premium price paid for it by urban consumers, induce the pig producers to continue to rear the indigenous pigs in states like Meghalaya and Nagaland. In fact, the indigenous pig population increased marginally in Nagaland and doubled in Meghalaya between the period 1992-2003, though the trend is slowly changing. States like Nagaland and Meghalaya depend on inter-state/country trade in livestock to meet the domestic demand which further degrades the state's economy. However, responding to the burgeoning demand for livestock products in a sustainable manner is a big challenge and also has huge potential to drive the socio-economic development of the states .

IMPACTS ON RURAL ECONOMY:

The sustenance of rural livelihoods is currently at stake than ever before, in the face of economic liberalization. Livelihoods options are shrinking in rural areas in general and more so in eco-fragile regions, such as drought, desert prone, hilly areas and other under developed / backward districts. Rapidly growing markets for livestock products in general, and dairy products in particular (owing to rise in per capita incomes) are opening new avenues for enhancing rural incomes. Agriculture, the main occupation of the farmers of Nagaland is subjective to high degree of uncertainty of income and unemployment. Animal Husbandry has provided livelihoods to millions of the poorest in our country and for many it is the sole source of livelihood bringing cash into their hands for daily sustenance. In Nagaland, as is the case in other states, the distribution of livestock among the poorest is far more equitable than the distribution of land. Livestock are often the only livelihood option available to the landless in the rural areas. Livestock therefore play an extremely critical role in supporting and sustaining livelihoods of a large number of poor. In Nagaland's rural areas, Dairying and Piggery are the livestock enterprise with the most potential-mostly for its low investment requirement and is an occupation of small farmers. Dairy and piggery production in the community provides milk and meat thus acting as food source and also as a form of human capital. Human capital such as good health ensures that, community has capacity to do other developmental activities thus empowering the community. Respondents acknowledged that income from the enterprises had led to economic empowerment of the community because of opportunities it creates. Income from the enterprises contributed to broadening of livelihood portfolio and community's overall development. Development of Animal husbandry in general and Dairy and Piggery sector in particular has had major impacts on all aspects of rural life in Nagaland. Some of them are summarized in brief below:-

i. Socio-Economic Development:

In the tribal community, livestock is also a form of wealth which often served as a status symbol and sometimes even as dowry in marriages as well as sacrificial offer in religious ceremonies. These facts clearly establish that livestock development is of crucial importance to Nagaland tribals. Dairy and Piggery creates a huge impact on the socio-economic development of the farmers. In the rural areas, backyard farming is very popular and common and acts as economic reserves in times of need. Surplus production has immense export potential due to high demand and becomes a substantial means for the region's socio- economic development. Livestock Ownership Village adoption Programme by the Department of Veterinary and Animal Husbandry has been initiated and designed to enhance Village Level Production through technological intervention like balanced feeds, Dewormers, Swine Fever vaccines, Spread of awareness etc. Accordingly, 15 Nos. of villages were adopted, assistance covering 2250 pigs under this programme. Livestock Development programmes designed to enhance meat production with people's participation has also been initiated under PPP mode. A total of 200 farmers are being assisted from 11 districts and 5 sub divisions for production of meat during 2014-15 through rural piggery, goatery and poultry. Under this programme, capacity building, infrastructure items, livestock, feeds, farm equipment etc. are being provided to the farmers to set up their farms. A large infrastructure in terms of veterinary hospitals/veterinary aid centres has been created and trained veterinary manpower is available both in urban and rural areas. This will not only help the State to improve animal health services but also encourage their development in private sector. Access to information on animal diseases, veterinary institutions and trained manpower is made available thereby helping in preventing economic losses through livestock mortality. The Nagaland pig production and marketing project started in the year 2008, is being funded by the National Agricultural Innovation Project

with contribution from the International Fund for Agricultural Development. It aims to develop sustainable solutions to livelihood improvement and employment generation especially in rural areas. Intensive Cattle Development Projects for cross breeding and upgradation programme have been taken up by the department. For people's participation in production, incentives in the form of Grant in Aid and Subsidies are provided so that production status is enhanced to meet the state demands**.** Growth of Dairy and piggery enterprises helps in socio-economic development of the rural people leading to empowerment of local rural communities which further encourages formation of Self Help groups and Co-Operatives. The impact of SHG's, Co-Operatives and Unions in Dairy and piggery enterprises area is a notable one due to their education programmes and supply of various breeds of milch/ higher germplasm breeding animals. In the absence of organized market infrastructure, it is necessary to liberate the rural milk and meat producers from the clutches of middlemen so that they get remunerative returns for their produce. In this context, milk co-operatives have played a crucial role in not only providing remunerative prices to producers but also extending various input and health care facilities to its member producers. This, in turn, has improved the economic position of producer members due to their education and awareness programmes, and supply of various aid related to dairy and piggery farming.

ii. Human Resource Development:

Livestock is an important source of income and employment in rural areas. With the increase in demand of milk and meat in Nagaland and the huge difference between demand and supply, there is dire need of trained human resource for better management and running of the farms for better productivity. Thus, this potentiality encourages the rural people who depends on animal husbandry- particularly dairy and piggery sectors for their livelihood to look for expansion of their knowledge base, get better

technological and scientific awareness so as to apply advanced knowledge in their own farms. The scope of growth of the sector has increased the manpower needs to support the developing and expanding farms and demand for human resource for animal husbandry sectors is slated for continued rise. With rapid advancement, change and global competitiveness in all sectors, the need for all human resource to be retrained to meet the newer challenges and for higher farm output has become a must. This requirement leads to human resource development and improves the quality of human resource within the rural areas. Nagaland's young demographic profile has made the State favorably placed in terms of manpower availability. However, it does not have the capacity to absorb this vibrant workforce. Increasing unemployment in the State among the educated youths of the State has been a subject of great concern. In the absence of any organized industry in the State, Dairying and Piggery sector can absorb a large fraction of such vast number of unemployed educated human resource in the State. Growth of these sectors have high potential to bring about better economic standing which would encourage development of positive attitude amongst peers. This further empowers the unemployed to initiate and develop self – employment opportunities and become self reliant thus utilizing untapped human resources in the rural areas.

iii. Employment Generation:

As agriculture is the mainstay of the State's economy, it continues to be the main source of livelihood and employment for majority of the population, particularly in the rural areas where more than 70 percent of the population live. In Nagaland, the agriculture sector employs about 70 percent of the State's population and its share to the State Domestic Product is about 30 percent. Apart from employment generated by rearing of the animals, the procurement of milk and meat and its processing also provides substantial employment. For full employment of farmers and improved economic growth agriculture-allied enterprises of dairy and piggery can be taken up as viable

profitable commercial projects. There is convincing evidence as to why examining this sector is a good starting point for finding solutions to livelihood security and employment stability. There are two major types of unemployment particularly in agricultural sector i.e; Disguised Unemployment and Seasonal Unemployment. Due to dependence use of family labour in agriculture (which is not paid wages in the usual sense), sometimes the number of persons working on land may be far in excess of those who are really required to produce the given volume of output. Thus, some of these workers are surplus as they do not add anything to the volume of production. Their marginal productivity, i.e., the addition to production made by an additional unit of labour, is zero from the point of view of the society such person is unemployed because he does not contribute to output. Hence, his employment remains disguised. In Agriculture; cultivation of crops is based on seasons and apart from maintenance of field, major full time labour is required only during sowing and harvesting months thus, the farmers can be considered to be unemployed or employed only for part time during other months. Also, the returns from agriculture can be received only after harvest. Dairy and Piggery enterprises creates employment for the seasonal rural farmers and assures additional income the whole year. The distribution patterns of income and employment show that small farm households hold more opportunities in livestock production. The growth in livestock sector is demand-driven, inclusive and pro-poor. Incidence of rural poverty is less in states like Punjab, Haryana, Jammu & Kashmir, Himachal Pradesh, Kerala, Gujarat, and Rajasthan where livestock accounts for a sizeable share of agricultural income as well as employment. Empirical evidence from India as well as from many other developing countries suggests that livestock development has been an important route for the poor households to escape poverty. In Nagaland, major Livestock enterprises are Dairy and Piggery. Development of Dairy and piggery enterprises helps in compounding the

unemployment problem by building an entrepreneurial culture with less capital but using the natural resources and traditionally reared animal husbandry animals.

iv. Livelihood Improvement:

With rising population and food needs the urban-rural divide is slowly increasing. Through infrastructure development and better marketing facilities, dairy and piggery enterprises can be a major vehicle in harnessing the entrepreneurial capacity and potential of rural people. Bridging the rural divide would mean 'production employment' in the rural sector and 'post production employment' in the urban sector. Livelihood options are shrinking in rural areas in general and more so in eco-fragile regions, such as drought, desert prone, hilly areas and other under developed /backward districts. Rapidly growing markets for livestock products in general, and dairy products in particular (owing to rise in per capita incomes) are opening new avenues for enhancing rural incomes. Dairy and Piggery enterprises play an important role as a subsidiary income to the landless and marginal farmers. Cattle and Pig manure can be used as organic fertilizers to improve agricultural yield. Agricultural growth has been highest in Nagaland at 10 percent during 2006-2007. This is much higher than the National average of 2 percent, which implies a tremendous potential for livelihood and employment opportunities in agricultural and allied activities based food processing industry. In 2008, the International Livestock Research Institute (ILRI) has also started a project with the Indian Council of Agricultural Research and the School of Agricultural Science and Rural Development, Nagaland University, to research and to increase the production and marketing of pigs in selected villages in Mon District. Livestock farming in rain-fed hill agri-ecosystem like Nagaland are complex and generally based on traditional socio-economic considerations. Increased productivity of livestock contributes to livelihood improvement of the rural people. The use of animal waste to fertilize fish

ponds leads to greater fish yield, as the manure provides active nutrients for the metabolic cycle of the ponds and promotes growth of natural feed(zoo-planktons and phyto- planktons) for fishes. Cattle and Pigs can also be used as a component for approach to intensive integrated farming systems with fishes for higher farm yield.

Cattle-Fish rearing:

In Lower hill areas of Dimapur and Peren District of Nagaland, considering the available water bodies along with cattle rearing could be feasible. In this system, fodder plants can be grown in the bund of the pond year round and the unused feed and the manure produced in cattle unit provide the required nutrients for fish. Approximately five cattle or buffalo's is thought to be sufficient for one ha. of fish pond.

Pig-Fish Farming:

In Nagaland, considering the resources for pig and fishery sector, this enterprise is thought to be most promising and profitable. Pig manure is rich in phosphorous and nitrogen which are highly essential to sustain a good fish fingerlings per hectare. Small pig sties can be constructed over the fish pond and for bigger units, bund of the fish pond can be used effectively for construction of low cost or permanent pig sties and the pig manure is allowed to enter the pond directly or can be collected from the sty in a pit for fermentation before applying to the pond or the fish can utilize the feed directly spilled by the pig, which would otherwise go to waste. On an average 30-40 pigs are sufficient to fertilize one hectare pond area.

v. Women Empowerment and Upliftment:

Livestock sector provides employment to 18 million people in India and nearly 70 per cent of them are women. Livestock production activities are largely in the hands of women. The rapidly increasing demand for livestock products creates opportunities for their empowerment. Harnessing these

however would require addressing constraints that women face along the value chain through appropriate policies and institutional arrangements. Empowerment is more than simply opening up access to decision making. It include the process that lead people to perceive themselves as able and entitled to occupy that decision making space. It is a process by which people, organization or groups who are powerless become aware of power dynamics at work in their life context and develop the skills and capacity for gaining some reasonable control over their lives. Traditionally Nagaland being a patriarchal society; though women are the main contributor of labour to domestic livestock rearing, the ownership of the animals will invariably be the head of the family i.e. the husband/father. Backyard farming of Dairy animals and Piggery sector in Nagaland is a family enterprise generally practiced by rural people and the contributions of women clearly highlight their articulation of activities in the farming practices. Despite their considerable involvement and contribution, significant gender inequalities also exist in access to technologies, credit, information, inputs and services probably because of inequities in ownership of productive assets including land and livestock. Appropriate policy and institutional arrangements such as establishment of Self Help Groups etc. would facilitate availing credit, insurance and other inputs and marketing services. Training women would reduce drudgery to women and improve animal productivity and enhance their economic returns. Nagaland has 40 percent of women work force employed in the agriculture sector. Agri and Allied sector, besides income generation and nutrition supplementation in the form of valuable animal protein, empowers the rural and tribal women and uplifts their living standards. Therefore a focus on this sector can contribute to greater gender equality.

vi. Improved Food Intake and Nutritional Security:

Malnutrition persists because those in real need have insufficient purchasing power. Intensive Dairy and piggery enterprises in the rural areas have increased the availability of quality animal protein in the diet of people in the form of milk, milk products and meat. This has resulted in reduction of malnutrition and increase in food intake. The formation of Milk Producers' Organizations (MPOs) provided greater income to the participating families at regular intervals thus increasing their purchasing powers. As the per capita expenditure increases, so does the expenditure on food products. In other words, there is a proportionate increase in the consumption of food as spending power increases. Thus, additional income provided by MPOs to families below the poverty line actually helps them increase their food intake. Given the low purchasing power of rural households, items of essential consumption not produced by the families themselves, such as salt, sugar, vegetable oils, spices, lentils and vegetables, have to be purchased daily. The provision of additional cash income daily or weekly undoubtedly helps the families increase their purchase and consumption of such essential commodities. It provides household nutritional security to the rural people.

vii. Controlling Migration:

Diversification into non-agricultural activities reduces the migration of the rural people in to urban towns. Adapting additional small scale dairy and piggery activities improves the earnings position of the rural population living on agriculture, to create and preserve jobs outside the agricultural activities that may contribute to diminishing the migration from the rural areas and to improving the rural living conditions. Its aim is to encourage the additional income generating production and service activities of households with earnings from the promotion of agricultural products produced locally in entering the market. The migration of active, well-trained labour force is going to continue similarly to the ageing and the decrease of rural populations

in small village regions. As a consequence of the falling natural increase in population and the migration of the active, well-trained labour force, depopulation and deteriorating age-structure of the village population is going to occur. Rural migration to urban areas is a continuous and irreversible process. This leads to congestion of urban and semi urban areas, making life tougher and competitive and hence inviting more anti- social elements. This tendency to opt for urban life can be greatly reduced if the living standard of the rural economy is improved. Livestock farming, specifically dairy and piggery in a scientific and profitable way can play a vital role in improving the rural economy. The strengthening of the local communities is an added value to the measures of rural development- that as multiplicator effect can influence the development of economy and the life quality independent of financial prosperity. Growth of dairy and piggery enterprises helps to increase living standards by improving the attractive feature of rural settlements in order to reverse outward migration and negative trends of economic and social conditions and depopulation of the rural areas.

As is discussed in this chapter, the Dairy and Piggery Enterprises in the rural economy is unquestionably interrelated to growth and development. These enterprises play a huge role and has a major impact on the economic development of the rural areas. Although, major concentration of pigs is in NE and eastern states, it is not able to meet the pork requirement of NE states and commercialization of milk and milk products is only recently taking ground. Thus, the huge surplus requirement of the state is obtained from inter-state/country trade, hence the scope of dairy and piggery enterprises in the region in general and Nagaland in particular. Predominantly non-descript dairy animals and pig populations there have poor yield/productivity. High cost of concentrate feed, frequent occurrences of endemics due to lack of medical infrastructure and professionals, non- availability vaccines and quality germplasm, lack of organized slaughter, processing plants and market

facilities have been the major constraints. Also, in the country's economic and statistics department report 2005-06 to 2010-11 , there was no area listed under fodder crops and permanent pastures and other grazing lands for both Nagaland and Meghalaya which further accentuates the practice of traditional animal husbandry farming which is not conducive to growth. Access to markets is critical to speed up commercialization of livestock production. Lack of access to markets acts as a disincentive to farmers to adopt improved technologies and quality inputs. Except for poultry products and recently to some extent for milk, markets for livestock and livestock products are underdeveloped, irregular, uncertain and lack transparency. Further, these are often dominated by informal market intermediaries who exploit the producers. Likewise, required facilities are too inadequate. Most of the pork meat production comes from unorganized make-shift slaughter houses and milk in communities are usually sold without packaging in the rural areas. Marketing and transaction costs of livestock products are high; taking 15-20% of the sale price. Therefore, commercialization is also not attractive to the low income group farmers. The extent to which the pro-poor potential of livestock can be harnessed would depend on how technology, institutions, policies and financial support address the constraints of the sector. The number-driven growth in livestock production may not sustain in the long run due to its increasing stress on the limited natural resources. The future growth has to come from improvements in technology and service delivery systems leading to accelerated productivity, processing and marketing.

CHAPTER V

INCOME AND COST BENEFIT ANALYSIS OF DAIRY AND PIGGERY ENTERPRISES.

The economic importance of dairy and piggery enterprises lies in the fact that it provides livelihood to many rural and sub-urban families. Hence, as component of the programmes of poverty eradication, dairy and piggery enterprises could play a pivotal role. This is also recognized by National Commission on Agriculture and other agencies in the field of rural development and is today accorded the status of thrust area by the Government. Dairy and Piggery Development Programmes are labour intensive, having favorable cost benefit ratio and are particularly suitable for weaker sections of the society mainly small, marginal and landless agricultural labourers of the country.

Dairy and piggery enterprises are a very complex and integrated activity affected by numerous factors. Socio-economic profile of dairy and piggery entrepreneurs are closely associated with their success in their enterprises. Economic condition of the entrepreneurs as may be reflected from their farm size determines their ability of investment on fixed and working capital which in turn determines the productivity and economic development of dairy and piggery enterprises. Level of literacy also acts as a barometer of social and cultural status of the entrepreneurs. Further, this throws light on the condition of adoption of improved technological dairying and slaughtering and help in decision making ability required in various entrepreneurial activities. Likewise, family size and composition indicate the availability of family labour. Again ‘Milk and Meat Production’, the prime activity of dairy and piggery enterprises and the major determinant of profitability is influenced by economies of production, performance of animals viz. lactation length, lactation yield, inter calving period etc. and their feeding, breeding and management. Dairy and piggery enterprises are labour intensive and at the same time, it requires a good amount of capital for its sustainability and growth as a commercial enterprise. The economic viability of any enterprise system is determined by the profit desired from the enterprise which in turn

depends on the cost and return from it. In the context of planned development of dairy and piggery enterprises, the need for data on cost and return along with employment potentials in these sectors are being increasingly felt for policy formulation and for organizing extension activities. Adequate knowledge of cost structure of milk and meat production is also essential for working out a pricing policy which also ensures producers to get remunerative price for their milk and meat at reasonable price.

An Enterprise is a venture, an undertaking or business, especially one of some scope, complication and risk. In other words; it is an industrious, systematic activity, especially when directed towards profit. The income and cost benefit of the dairy and piggery enterprises is calculated with data information gathered through sample survey at producer level, also helped by simple Questionnaire replies. According to the current scenario of enterprises in Nagaland, this research study has been carried out with differentiation between Small , Medium and Large Enterprises on the criterion: (i) Number of Employees and (ii) Number of Cattle/Pigs owned by the Enterprise.

(i) Number of full-time Employees :

Small Enterprise: 1-5

Medium Enterprise: 6-10

Large Enterprises: 11 and above

(ii) Number of Cattle/Pigs owned by the Enterprise :

a. For Dairy Enterprise:

Small Enterprise: 0-5

Medium Enterprise: 6-10

Large Enterprises: 11 and above

b. For Piggery Enterprise:

Small Enterprise: 1-10

Medium Enterprise: 11-30

Large Enterprises: 31 and above

Most of the dairy and piggery enterprises in Nagaland are small enterprises. Small and medium enterprises outnumber large enterprises by a wide margin. In Nagaland, the enterprises have very few full-time employees and contracts part time employees for some maintenance work, fodder collection, transportation, etc. Salary structure in dairy and piggery enterprises are not attractive and thus, the sector rarely attracts local educated employees / human resource. Locals involved in dairy and piggery enterprises are at most times the owner of the venture or has familial connection with the owner. Sample survey was conducted and a questionnaire was prepared for 288 respondents at producer level . The survey puts 85% of dairy and piggery sector enterprises as small enterprise,13% for medium enterprise and only 2% large enterprise. Large enterprises in Nagaland are very few and mostly government based. They are mostly found in urban and peri-urban areas. The production practiced is only for commercialization and not home consumption, unlike the small and medium enterprises, where production is mostly for sustenance and surplus is sold to supplement income. The milking animals considered for the study are Cattle and Buffaloes only. The production of milk by other livestock animals is negligible in Nagaland and are not part of the study. The period taken for study of income of enterprise is One year only and therefore for piggery enterprise, fattening and sale of pork meat is taken for research but the breeding solely for piglet production and sale of piglets thereafter has not been included. The economic viability of the enterprise is dependent on how it is being managed and steered for achieving the set objectives. All price calculations done is based on cost value taken at current prices for 2014-15 year period. Dairy and Piggery enterprise selected

for the study, like any other business enterprise are run on the objectives of getting fair return from the enterprises. The success of a Dairy and Piggery enterprise is determined by the return derived from activities performed by it. Hence, dairy enterprises should be managed professionally to get the maximum return on sustainable basis. The major components of the enterprises that needs to be managed are:-

a. Livestock Breed.
b. Housing
c. Feeding.
d. Health care and Sanitation.

The above functions of dairy/Piggery management in Nagaland in the context of the sample enterprises are discussed below:

In the context of planned development of dairy and piggery sector, data on cost and return along with employment potential is being increasingly felt, both for policy formulation and organizing extension activities. Adequate knowledge of cost structure of milk/meat production is also essential for working out a pricing policy that ensures producers to get remunerative price for their milk and consumers get milk and milk products at a reasonable price.

MAJOR COMPONENTS FOR MANAGEMENT:

Livestock Breed:

Most of the milking cows are crossbreed Jersey and Holstein Friesian in nature and majority of the total milking cows are of this type. The State Cattle breeding Farms are producing quality heifers for breeding and propagation for the farmers. For pigs, Naga local or doom pig are preferred by the consumers. However, growth is very slow with only about 45kg in 8-12 months. Farmers are therefore more interested in rearing cross breed and Hampshire breed. Large black cross, Ghungroo and Burmese black are also

common. The entrepreneurs are recently showing preference to crossbreed cattle/pigs more than the local breed varieties because of higher yield of milk/meat. As a result of which, more and more farmers are availing artificial insemination breeding methods for the animals in their farms.

Housing:

Almost all the dairy entrepreneurs construct the cattle sheds using locally available wood with Corrugated Galvanised Iron (C.G.I) in the roof. The sheds are 7 to 8 feet high and it is found that almost all the small and medium entrepreneurs maintained kuccha (earthen) floor while most of the large entrepreneurs construct pucca floor for the cowsheds. For Pigs, the sty constructed is mostly with locally available bamboo/wood and the roof is made of CGI sheets. The sheds are 5 to 6 feet high and the floor of the sty is mostly wooden platform type or kuccha (earthen) floor. Peri-urban and urban enterprises also use concrete floors. Besides concrete housing, for smell less pig production deep litter type of housing is being introduced recently by large enterprise entrepreneurs

Feeding:

Dairy animals are fed with Dry fodder, Green fodder, Vegetables, Silage, Balanced feed and concentrates. Paddy straw is the predominant dry roughage/fodder fed to cows by almost all the dairy entrepreneurs. Also jungles grasses, shrubs and tree leaves constitute the major part of green fodder. The different common concentrated feed ingredients are wheat bran, Mustard Oil Cake (MOC), Ground Nut Cake (GNC), rice polish and common salt. The feed ingredients used by pig farmers mainly include kitchen waste, concentrated mixture of broken rice, wheat bran rice brew, pumpkin and maize. Besides this, the farmers also feed their animals with tuber crops like colocasia, tapioca, sweet potato and many non conventional grasses, tree leaves either cooked or as raw form. Feeding frequency is twice daily in most

of the cases, although some farmers have adopted feeding schedule of small portions for more than twice a day with enough ration of water.

Health care and Sanitation:

The health care practices in remote rural areas are mostly depending on Indigenous Technical Knowledge (ITK's) and in peri-urban region through veterinary practitioners. Regular vaccination against commonly occurring diseases is practiced only by few progressive farmers. Majority of the small and medium enterprises practice traditional production system and mortality becomes the main cause of concern. Very often, diseases remain undiagnosed due to poor veterinary services in the rural region. Most of the farmers treat the sick animal by themselves by using locally available herbs or medicine from the local dispensary. Veterinary services are very poor in most of the parts of Nagaland and only 10% of farmers surveyed, have veterinary aid service centres within walking distance of their farms (taken as 1-2 km). Rural entrepreneurs are found to breed their animals naturally, whereas all the large enterprise farmers have adopted artificial insemination services for better breed/yield and more economical productivity. Animals showing signs of sickness are often slaughtered for home consumption or sold in roadside market at cheaper price.

Dung and other solids like feed residuals are removed manually. Liquids like urine and waste water are taken away from the shed/sty through gutter. The sheds and animals are washed once or twice in a week. Scavenging for pigs is no longer practiced for hygiene reasons except in some remote areas. Animals dying of sickness as per survey are usually buried in the jungles.

COST STRUCTURE OF DAIRY & PIGGERY ENTERPRISES:

The cost concept used in the study is gross cost which includes both cash cost and non cash cost. Cash cost includes cost of dry and green fodder, cost of concentrates, labour cost, repairs of cowshed, medicines and miscellaneous expenses. Non-cash cost includes depreciation on cowshed and equipments and cost of family labour. Since few of the entrepreneurs grow green fodder on their land, so it is considered as non-cash cost. The value of feeds and fodder (both home produced and purchase), labour charges (both from family and hired/employed labour) etc. are computed as per prevailing market rate (2014-15). Depreciation on recurring management of enterprise is also included in calculation of capital cost. During field survey, it was found that no loan was outstanding and therefore, interest is not included in the cost structure. It was also found that no entrepreneur had insured their cows, so there was no insurance cost. Cost of feeding includes the cost of wheat bran, rice bran, oil cake, green fodder, dry fodder, minerals etc. Cost of Healthcare includes vaccination and medicine cost and doctor charges. Cost of labour includes salary paid to the permanent employee and wages paid to hired labour. Maintenance cost means repairing cost of cowsheds. Other miscellaneous cost includes cost of sanitation management, cost of insemination, expenses for carrying produce to the selling point.etc. The monthly cost structure of dairy and piggery enterprises of Nagaland are shown in table 5:1 and 5.2 respectively .

Table 5.1 (i): Monthly District-wise Cost of Dairy Enterprises with Element Wise Percentage Division.

DISTRICTS	Size of Enterprises		A. Feeding cost	B. Health care	C. Labour	D. Maintenance	E. Miscellaneous	F. Depreciation	Total A + B + C + D +E +F
DIMAPUR	Small	Rupees	11160	180	5400	360	360	540	18000
		%	62	1	30	2	2	3	100
	Medium	Rupees	21717	381	13716	381	1143	762	38100
		%	57	1	36	1	3	2	100
	Large	Rupees	31238	589	24166	589	1179	1179	58940
		%	53	1	41	1	2	2	100
KOHIMA	Small	Rupees	12028	194	6014	388	388	388	19400
		%	62	1	31	2	2	2	100
	Medium	Rupees	23450	404	14555	404	809	809	40431
		%	58	1	36	1	2	2	100
	Large	Rupees	31627	608	25545	608	1216	1216	60820
		%	52	1	42	1	2	2	100
MON	Small	Rupees	8335	124	3359	124	249	249	12440
		%	67	1	27	1	2	2	100
	Medium	Rupees	14628	488	8046	244	488	488	24382
		%	60	2	33	1	2	2	100
	Large	Rupees	19729	352	13388	352	705	705	35231
		%	56	1	38	1	2	2	100
TUENSANG	Small	Rupees	8262	127	3432	127	381	381	12710
		%	65	1	27	1	3	3	100
	Medium	Rupees	13335	460	8047	230	460	460	22992
		%	58	2	35	1	2	2	100
	Large	Rupees	19114	348	13552	348	695	695	34752
		%	55	1	39	1	2	2	100
MOKOKCHUNG	Small	Rupees	9798	163	5552	163	327	327	16330
		%	60	1	34	1	2	2	100
	Medium	Rupees	16531	295	10628	590	590	886	29520
		%	56	1	36	2	2	3	100
	Large	Rupees	22409	423	16912	423	845	1268	42281
		%	53	1	40	1	2	3	100

WOKHA	Small	Rupees	7224	117	3728	117	233	233	11652
		%	62	1	32	1	2	2	100
	Medium	Rupees	12632	221	7978	443	443	443	22160
		%	57	1	36	2	2	2	100
	Large	Rupees	16245	625	12496	312	625	937	31240
		%	52	2	40	1	2	3	100
PHEK	Small	Rupees	7925	130	4287	130	260	260	12992
		%	61	1	33	1	2	2	100
	Medium	Rupees	13530	242	8698	483	483	724	24160
		%	56	1	36	2	2	3	100
	Large	Rupees	19528	383	15699	766	766	1149	38291
		%	51	1	41	2	2	3	100
ZUNHEBOTO	Small	Rupees	7201	114	3429	114	343	229	11430
		%	63	1	30	1	3	2	100
	Medium	Rupees	13463	236	8503	236	472	709	23619
		%	57	1	36	1	2	3	100
	Large	Rupees	17373	334	13698	334	668	1002	33409
		%	52	1	41	1	2	3	100
PEREN	Small	Rupees	7917	124	3711	247	247	124	12370
		%	64	1	30	2	2	1	100
	Medium	Rupees	12397	451	8115	225	676	676	22540
		%	55	2	36	1	3	3	100
	Large	Rupees	16692	642	12840	321	642	963	32100
		%	52	2	40	1	2	3	100
KIPHIRE	Small	Rupees	6293	102	3249	102	203	203	10152
		%	62	1	32	1	2	2	100
	Medium	Rupees	12533	224	8281	448	448	448	22382
		%	56	1	37	2	2	2	100
	Large	Rupees	19183	369	15125	369	738	1107	36891
		%	52	1	41	1	2	3	100
LONGLENG	Small	Rupees	7081	112	3373	112	337	225	11240
		%	63	1	30	1	3	2	100
	Medium	Rupees	12130	213	7874	213	426	426	21282
		%	57	1	37	1	2	2	100
	Large	Rupees	18316	339	13228	339	678	1017	33918
		%	54	1	39	1	2	3	100

Source: Sample Survey

Table 5.1 (ii): Weighted Average for Size of Enterprise (in Rupees)

DISTRICT	SIZE OF ENTERPRISES		
	Small	Medium	Large
DIMAPUR	18000	38100	58940
KOHIMA	19400	40431	60820
MON	12440	24382	35231
TUENSANG	12710	22992	34752
MOKOKCHUNG	16330	29520	42281
WOKHA	11652	22160	31240
PHEK	12992	24160	38291
ZUNHEBOTO	11430	23619	33409
PEREN	12370	22540	32100
KIPHIRE	10152	22382	36891
LONGLENG	11240	21282	33918
TOTAL WEIGHTED AVERAGE	**13519.64**	**26506.18**	**39806.64**

Source: Sample Survey.

From tables 5.1 (i) and (ii), it is found that for Dairy Enterprises the total weighted average of monthly amount cost spent for the state are:-

Small sized Enterprises = `1,315.64

Medium Enterprises = `26,506.18

Large Enterprises = `39,806.64

For small enterprise, monthly cost is highest in Kohima at `19,400. Kiphire District has the least cost monthly at `10,152. For medium enterprise, monthly cost is highest in Kohima at `40,431 and lowest for Longleng at `21,282. For large enterprise monthly cost is highest in Kohima at `60820 and lowest in Wokha at `31,240.

NOTE:

Average number of cattle taken in calculation: Small enterprises = 3 nos., medium enterprise = 7 nos. and large enterprises = 13 nos.

Table 5.2 (i): Monthly District-wise Cost of Piggery Enterprises in Nagaland with Element wise Percentage Division.

DISTRICTS	Size of Enterprises		A. Feeding cost	B. Health care	C. Labour	D. Maintenance	E. Miscellaneous	F. Depreciation	Total A + B + C + D +E+F
DIMAPUR	Small	Rupees	6160	88	2024	88	176	264	8800
		%	70	1	23	1	2	3	100
	Medium	Rupees	11730	170	4250	170	340	340	17000
		%	69	1	25	1	2	2	100
	Large	Rupees	25200	350	7700	350	700	700	35000
		%	72	1	22	1	2	2	100
KOHIMA	Small	Rupees	6390	90	1980	180	180	180	9000
		%	71	1	22	2	2	2	100
	Medium	Rupees	12600	180	4320	180	360	360	18000
		%	70	1	24	1	2	2	100
	Large	Rupees	27360	380	8360	380	760	760	38000
		%	72	1	22	1	2	2	100
MON	Small	Rupees	3400	50	1200	100	150	100	5000
		%	68	1	24	2	3	2	100
	Medium	Rupees	7810	110	2530	110	220	220	11000
		%	71	1	23	1	2	2	100
	Large	Rupees	14000	200	4800	400	200	400	20000
		%	70	1	24	2	1	2	100
TUENSANG	Small	Rupees	4380	60	1200	120	120	120	6000
		%	73	1	20	2	2	2	100
	Medium	Rupees	9360	130	2860	130	260	260	13000
		%	72	1	22	1	2	2	100
	Large	Rupees	15180	220	5500	220	440	440	22000
		%	69	1	25	1	2	2	100
MOKOKCHUNG	Small	Rupees	5600	80	1920	80	160	160	8000
		%	70	1	24	1	2	2	100
	Medium	Rupees	10500	150	3600	150	300	300	15000
		%	70	1	24	1	2	2	100
	Large	Rupees	17940	260	6500	260	520	520	26000
		%	69	1	25	1	2	2	100

WOKHA	Small	Rupees	3905	55	1320	55	110	55	5500
		%	71	1	24	1	2	1	100
	Medium	Rupees	7140	102	2448	102	204	204	10200
		%	70	1	24	1	2	2	100
	Large	Rupees	14007	203	5075	203	406	406	20300
		%	69	1	25	1	2	2	100
PHEK	Small	Rupees	4680	65	1430	65	130	130	6500
		%	72	1	22	1	2	2	100
	Medium	Rupees	8400	120	2880	120	240	240	12000
		%	70	1	24	1	2	2	100
	Large	Rupees	16330	230	5520	230	230	460	23000
		%	71	1	24	1	1	2	100
ZUNHEBOTO	Small	Rupees	3780	54	1296	108	108	54	5400
		%	70	1	24	2	2	1	100
	Medium	Rupees	7455	105	2415	105	210	210	10500
		%	71	1	23	1	2	2	100
	Large	Rupees	14700	210	5040	210	420	420	21000
		%	70	1	24	1	2	2	100
PEREN	Small	Rupees	4965	66	1325	66	132	66	6620
		%	75	1	20	1	2	1	100
	Medium	Rupees	9344	128	2688	128	256	256	12800
		%	73	1	21	1	2	2	100
	Large	Rupees	15620	220	5060	220	440	440	22000
		%	71	1	23	1	2	2	100
KIPHIRE	Small	Rupees	4322	58	1227	58	117	58	5840
		%	74	1	21	1	2	1	100
	Medium	Rupees	7776	108	2376	108	216	216	10800
		%	72	1	22	1	2	2	100
	Large	Rupees	14000	200	4800	200	400	400	20000
		%	70	1	24	1	2	2	100
LONGLENG	Small	Rupees	4104	56	1180	56	112	112	5620
		%	73	1	21	1	2	2	100
	Medium	Rupees	7200	100	2200	100	200	200	10000
		%	72	1	22	1	2	2	100
	Large	Rupees	14200	200	4600	200	400	400	20000
		%	71	1	23	1	2	2	100

Source: Sample Survey.

Table 5.2 (ii): Weighted Average for Size of Enterprise. (In Rupees)

DISTRICT	SIZE OF ENTERPRISES		
	Small	Medium	Large
DIMAPUR	8800	17000	35000
KOHIMA	9000	18000	38000
MON	5000	11000	20000
TUENSANG	6000	13000	22000
MOKOKCHUNG	8000	15000	26000
WOKHA	5500	10200	20300
PHEK	6500	12000	23000
ZUNHEBOTO	5400	10500	21000
PEREN	6620	12800	22000
KIPHIRE	5840	10800	20000
LONGLENG	5620	10000	20000
TOTAL WEIGHTED AVERAGE	**6570.91**	**12754.55**	**24300.00**

Source: Sample Survey.

From tables 5.2 (i) and (ii), it is found that for Piggery Enterprises the total weighted average of monthly amount cost spent for the state are:-

Small sized Enterprises = ` 6,570.91

Medium Enterprises = `12,754.55

Large Enterprises = `24,300.00

For small enterprise, monthly cost is highest in Kohima at `9,000. Mon District has the least cost monthly at `5,000. For medium enterprise, monthly cost is highest in Kohima at `18,000 and lowest for Longleng at `10,000. For large enterprise, monthly cost is highest in Kohima at `38000 and lowest in Mon, Kiphire & Longleng at `20,000.

NOTE:

Average number of pigs taken in calculation: Small enterprises = 8 nos., medium enterprise = 22 nos. large enterprises = 42 nos.

COST PER LITRE OF MILK /PER KILOGRAM OF PORK MEAT OF PRODUCE:

Cost of one litre of milk/one kg of meat is calculated for each size of enterprises in Nagaland. The table that follows also provides calculated data for all 11 districts of Nagaland. All cost which are taken for calculating monthly average cost are also considered for this purpose.

The method applied to calculate cost per litre of milk is as follows:

$$\frac{\text{Total Monthly Cost}}{\text{Total Quantity of Milk Sold is a Month}}$$

The method applied to calculate cost per kg. of pork meat is as follows:

$$\frac{\text{Total Monthly Cost}}{\text{Total Quantity of Meat Sold is a Month}}$$

Thus, the quantity of milk/meat sold is considered to find out cost per litre of milk/per kg. of meat. Milk/Meat used for household consumption is excluded. The reasons for this is that the entrepreneurs generally do not keep the record of produce used for consumption and during survey, they could not tell precisely the quantity so used. Secondly, since the sample dairy and piggery enterprises are commercial farms, so the return (profit) is calculated on the basis of milk/meat sold only ignoring the value of produce consumed.

Table 5.3 (i): Monthly Element wise Cost Per Litre of Milk in Nagaland in Rupees.

DISTRICTS	Size of Enterprises	A.Feeding cost	B.Medicine etc.	C.Labour	D.Repairs of cowshed	E.Miscellaneous	F.Depreciation	Total (A + B + C + D +E + F)
DIMAPUR	Small	11.63	0.19	5.63	0.38	0.38	0.56	18.77
	Medium	11.31	0.20	7.14	0.20	0.60	0.40	19.85
	Large	10.01	0.19	7.75	0.19	0.38	0.38	18.9
KOHIMA	Small	13.36	0.22	6.68	0.43	0.43	0.43	21.55
	Medium	13.03	0.22	8.09	0.22	0.45	0.45	22.46
	Large	10.81	0.21	8.73	0.21	0.42	0.42	20.8
MON	Small	11.58	0.17	4.67	0.17	0.35	0.35	17.29
	Medium	10.16	0.34	5.59	0.17	0.34	0.34	16.94
	Large	9.13	0.16	6.20	0.16	0.33	0.33	16.31
TUENSANG	Small	11.48	0.18	4.77	0.18	0.53	0.53	17.67
	Medium	10.58	0.37	6.39	0.18	0.37	0.37	18.26
	Large	9.65	0.18	6.84	0.18	0.35	0.35	17.55
MOKOKCHUNG	Small	11.66	0.19	6.61	0.19	0.39	0.39	19.43
	Medium	9.84	0.18	6.33	0.35	0.35	0.53	17.58
	Large	8.84	0.17	6.67	0.17	0.33	0.50	16.68
WOKHA	Small	10.95	0.18	5.65	0.18	0.35	0.35	17.66
	Medium	9.57	0.17	6.04	0.34	0.34	0.34	16.8
	Large	8.20	0.32	6.31	0.16	0.32	0.47	15.78
PHEK	Small	11.01	0.18	5.95	0.18	0.36	0.36	18.04
	Medium	10.02	0.18	6.44	0.36	0.36	0.54	17.9
	Large	9.10	0.18	7.32	0.36	0.36	0.54	17.86
ZUNHEBOTO	Small	12.00	0.19	5.72	0.19	0.57	0.38	19.05
	Medium	11.22	0.20	7.09	0.20	0.39	0.59	19.69
	Large	8.77	0.17	6.92	0.17	0.34	0.51	16.88
PEREN	Small	11.10	0.19	5.62	0.37	0.37	0.19	17.84
	Medium	9.84	0.36	6.44	0.18	0.54	0.54	17.9
	Large	8.06	0.31	6.20	0.16	0.31	0.47	15.51
KIPHIRE	Small	11.65	0.19	6.02	0.19	0.38	0.38	18.81
	Medium	10.44	0.19	6.90	0.37	0.37	0.37	18.64
	Large	9.78	0.19	7.71	0.19	0.38	0.56	18.81
LONGLENG	Small	11.80	0.19	5.62	0.19	0.56	0.38	18.74
	Medium	10.50	0.18	6.82	0.18	0.37	0.37	18.42
	Large	9.69	0.18	6.10	0.18	0.36	0.54	17.05

Source: Sample Survey.

Table 5.3 (ii): Weighted Average Cost Overall (includes all 11 districts) for Size of Enterprise in Rupees.

Size of Enterprise	A. Feeding cost	B. Medicine etc.	C. Labour	D. Repairs of cowshed	E. Miscellaneous	F. Depreciation
Small	10.65	0.17	5.21	0.21	0.39	0.37
Medium	9.70	0.20	6.08	0.23	0.36	0.39
Large	8.54	0.18	6.41	0.18	0.32	0.42

Source: Sample Survey.

Table 5.3 (i) & (ii): All small, medium and large enterprises spend the highest amount on cost for feed followed by labour, miscellaneous, repairs of sheds and the lowest amount spent is on cost for medicine.

Table 5.4 (i): Monthly Element wise Cost Per Kilogram of Pork Meat in Nagaland in Rupees.

DISTRICTS	Size of Enterprises	A. Feeding cost	B. Medicine etc.	C. Labour	D. Repairs of cowshed	E. Miscellaneous	F. Depreciation	Total A + B + C + D +E +F
DIMAPUR	Small	77	1.1	25.3	1.1	2.2	3.3	110
	Medium	58.65	0.85	21.25	0.85	1.7	1.7	85
	Large	60	0.83	18.33	0.83	1.67	1.67	83.33
KOHIMA	Small	82.99	1.17	25.71	2.34	2.34	2.34	116.89
	Medium	65.63	0.94	22.5	0.94	1.88	1.88	93.77
	Large	67.89	0.94	20.74	0.94	1.89	1.89	94.29
MON	Small	50.75	0.75	17.91	1.49	2.24	1.49	74.63
	Medium	46.77	0.66	15.15	0.66	1.32	1.32	65.88
	Large	40	0.57	13.71	1.14	0.57	1.14	57.13
TUENSANG	Small	76.84	1.05	21.05	2.11	2.11	2.11	105.27
	Medium	65.92	0.92	20.14	0.92	1.83	1.83	91.56
	Large	50.94	0.74	18.46	0.74	1.48	1.48	73.84
MOKOKCHUNG	Small	76.71	1.10	26.30	1.10	2.19	2.19	109.59
	Medium	57.38	0.82	19.67	0.82	1.64	1.64	81.97

	Large	46.60	0.68	16.88	0.68	1.35	1.35	67.54
WOKHA	Small	61.98	0.87	20.95	0.87	1.75	0.87	87.29
	Medium	45.19	0.65	15.49	0.65	1.29	1.29	64.56
	Large	42.06	0.61	15.24	0.61	1.22	1.22	60.96
PHEK	Small	78	1.08	23.83	1.08	2.17	2.17	108.33
	Medium	56	0.8	19.2	0.8	1.6	1.6	80
	Large	51.84	0.73	17.52	0.73	0.73	1.46	73.01
ZUNHEBOTO	Small	68.73	0.98	23.56	1.96	1.96	0.98	98.17
	Medium	54.42	0.77	17.63	0.77	1.53	1.53	76.65
	Large	51.22	0.73	17.56	0.73	1.46	1.46	73.16
PEREN	Small	99.3	1.32	26.48	1.32	2.64	1.32	132.38
	Medium	74.75	1.02	21.50	1.02	2.05	2.05	102.39
	Large	59.39	0.84	19.24	0.84	1.67	1.67	83.65
KIPHIRE	Small	81.55	1.09	23.15	1.09	2.21	1.09	110.18
	Medium	58.47	0.81	17.86	0.81	1.62	1.62	81.19
	Large	50	0.71	17.14	0.71	1.43	1.43	71.42
LONGLENG	Small	85.48	1.17	24.58	1.17	2.33	2.33	117.06
	Medium	60	0.83	18.33	0.83	1.67	1.67	83.33
	Large	56.35	0.79	18.25	0.79	1.59	1.59	79.36

Source: Sample Survey.

Table 5.4 (ii): Weighted Average Cost Overall (includes all 11 districts) for Size of Enterprise in Rupees.

Size of Enterprise	A. Feeding cost	B. Medicine etc.	C. Labour	D. Repairs of cowshed	E. Miscellaneous	F. Depreciation
Small	76.30	1.06	23.53	1.42	2.19	1.84
Medium	58.47	0.82	18.97	0.82	1.65	1.65
Large	52.39	0.74	17.55	0.79	1.37	1.49

Source: Sample Survey.

In table 5.4 (i) & (ii) , all small, medium and large enterprises spend the highest amount on cost for feed followed by labour, miscellaneous, repairs of sheds and the lowest amount spent is on cost for medicine.

The following tables Table 5.5 (i) and (ii) gives the average cost of 1 litre of milk/1 kg. of meat for the different size enterprise, i.e. small, medium and large. The data is given for all 11 districts of the state. The weighted average for all the different sized enterprises is calculated separately for all districts.

Table 5.5 (i): Average Cost Per litre of Milk for Nagaland in Rupees.

DISTRICT	SIZE OF ENTERPRISES			
	Small	Medium	Large	Weighted Average
DIMAPUR	18.77	19.85	18.9	19.17
KOHIMA	21.55	22.46	20.8	21.60
MON	17.29	16.94	16.31	16.85
TUENSANG	17.67	18.26	17.55	17.83
MOKOKCHUNG	19.43	17.58	16.68	17.90
WOKHA	17.66	16.8	15.78	16.75
PHEK	18.04	17.9	17.86	17.93
ZUNHEBOTO	19.05	19.69	16.88	18.54
PEREN	17.84	17.9	15.51	17.08
KIPHIRE	18.81	18.64	18.81	18.75
LONGLENG	18.74	18.42	17.05	18.07
TOTAL WEIGHTED AVERAGE	**18.62**	**18.59**	**17.47**	**18.22**

Source: Sample Survey.

As per the table, calculated weighted average for overall cost in production of 1litre milk in Nagaland is `18.22. Small enterprises has the highest weighted average cost/kg of pork meat at `18.62, followed by medium enterprises at `18.59 and large enterprises at `17.47. The cost in production for 1 litre of milk is highest in Kohima at `21.60 followed by Dimapur at `19.75 and lowest for Wokha District at `16.75

Table 5.5 (ii): Average Cost Per Kilogram of Pork Meat for Nagaland.

DISTRICT	SIZE OF ENTERPRISES			
	Small	Medium	Large	Weighted Average
DIMAPUR	110	85	83.33	92.78
KOHIMA	116.89	93.77	94.29	101.65
MON	74.63	65.88	57.13	65.88
TUENSANG	105.27	91.56	73.84	90.22
MOKOKCHUNG	109.59	81.97	67.54	86.37
WOKHA	87.29	64.56	60.96	70.94
PHEK	108.33	80	73.01	87.11
ZUNHEBOTO	98.17	76.65	73.16	82.66
PEREN	132.38	102.39	83.65	106.14
KIPHIRE	110.18	81.19	71.42	87.60
LONGLENG	117.06	83.33	79.36	93.25
TOTAL WEIGHTED AVERAGE	**106.34**	**82.39**	**74.34**	**87.69**

Source: Sample Survey.

As per the table, calculated weighted average for overall cost in production of 1kg pork meat in Nagaland is `87.69. Small enterprises has the highest weighted average cost/kg of pork meat at `106.34, followed by medium enterprises at `82.39 and large enterprises at `74.34. The cost in production for 1kg of pork meat is highest in Peren at `106.14 followed by Kohima at `101.65 and lowest for Mon District at `65.88.

INVESTMENT ANALYSIS:

Amount of Start-Up investment is an important indicator of financial health of an enterprise. It also indicates the risk bearing capacity of Entrepreneurs. For the purpose of the present study of capital investment of a dairy and piggery enterprises, four elements – namely, livestock, cowshed, equipments and fodder stock are taken. The investment is analyzed for all the districts of Nagaland taken as study zones. The values of cows, pigs and fodder stock are taken at the market value prevailing during the time of

survey. The value of cowshed, sty and equipments are taken at an estimated value considering the current market price. In the given tables, these are shown at gross values i.e., without deducting depreciation. Depreciation is however, taken to calculate cost of milk production. All the study areas are in the state and have similar infrastructure, constraints, cost of primary materials etc. So there is only little variation of value.

Table 5.6: District-wise Farm Start-up Investment in Dairy Enterprises (In Rupees).

District	Size of Enterprise			Average Investment
	Small	Medium	Large	
DIMAPUR	190000	360000	592800	380933
KOHIMA	198000	366400	600000	388133
MON	162000	335600	557300	351633
TUENSANG	152000	338500	558600	349700
MOKOKCHUNG	185000	354200	588900	376033
WOKHA	165000	341500	564400	356967
PHEK	163200	339800	555600	352867
ZUNHEBOTO	172800	340400	558600	357267
PEREN	168200	333000	550200	350467
KIPHIRE	156900	331700	551500	346700
LONGLENG	158600	334100	554700	349133
TOTAL AVERAGE INVESTMENT	**170155**	**343200**	**566600**	**359985**

Source: Sample Survey.

Data represented in the table, ascertained that, the average one time start-up investment amounts per enterprise. The overall start-up investment overall for all three modes of enterprise i.e. small, medium and large is found to be `3,59,985. For small sized enterprises, the average investment to start the venture is `1,70,155. For medium sized enterprise, the amount is `3,43,200. For Large sized enterprise the average investment amount is `5,66,600.

Table 5.7: District-wise Farm Start-up Investment in Piggery Enterprises (In Rupees).

District	Size of Enterprise			Average Investment
	Small	Medium	Large	
DIMAPUR	80000	170000	260000	510000
KOHIMA	92000	185000	276000	553000
MON	64000	154000	240000	458000
TUENSANG	68000	143000	230100	441100
MOKOKCHUNG	74000	166000	253000	493000
WOKHA	70100	158000	247600	475700
PHEK	68800	155500	244800	469100
ZUNHEBOTO	67900	153100	241700	462700
PEREN	65400	149900	237600	452900
KIPHIRE	66000	152700	240000	458700
LONGLENG	63400	147500	235400	446300
TOTAL AVERAGE INVESTMENT	**70873**	**157700**	**246018**	**474591**

Source: Sample Survey.

Table 5.7 shows that, the average one time start-up investment amounts per enterprise. The overall start-up investment overall for all three modes of enterprise i.e. small, medium and large is found to be `4,74,591. For small sized enterprises, the average investment to start the venture is `70,873. For medium sized enterprise, the amount is `1,57,700. For Large sized enterprise the average investment amount is `2,46,018.

The total investment amount and the amount spent on each of the elements that goes into management of farm is broken down and shown in the following tables. The elements are divided into four components- Livestock, Housing, Equipments and Fodder. The break-up is also provided for all three sized enterprises in all 11 districts of Nagaland for better assessment.

Table 5.8: Element Wise Investment Per Dairy Enterprise in Nagaland.

DISTRICT	SIZE OF ENTERPRISE		ELEMENT				TOTAL
			LIVESTOCK	STALL/ SHED	EQUIPMENT	FODDER STOCK	
DIMAPUR	Small	Rupees	153900	24700	3800	7600	190000
		%	81	13	2	4	100
	Medium	Rupees	288000	39600	14400	18000	360000
		%	80	11	4	5	100
	Large	Rupees	468312	71136	17784	35568	592800
		%	79	12	3	6	100
KOHIMA	Small	Rupees	158400	23760	5940	9900	198000
		%	80	12	3	5	100
	Medium	Rupees	296784	40304	10992	18320	366400
		%	81	11	3	5	100
	Large	Rupees	474000	66000	24000	36000	600000
		%	79	11	4	6	100
MON	Small	Rupees	131220	16200	6480	8100	162000
		%	81	10	4	5	100
	Medium	Rupees	268480	36916	10068	20136	335600
		%	80	11	3	6	100
	Large	Rupees	440267	66876	16719	33438	557300
		%	79	12	3	6	100
TUENSANG	Small	Rupees	124640	15200	4560	7600	152000
		%	82	10	3	5	100
	Medium	Rupees	267415	37235	13540	20310	338500
		%	79	11	4	6	100
	Large	Rupees	446880	61446	22344	27930	558600
		%	80	11	4	5	100
MOKOKCHUNG	Small	Rupees	148000	20350	7400	9250	185000
		%	80	11	4	5	100
	Medium	Rupees	279818	42504	10626	21254	354200
		%	79	12	3	6	100
	Large	Rupees	471120	64779	17667	35334	588900
		%	80	11	3	6	100
WOKHA	Small	Rupees	132000	19800	4950	8250	165000
		%	80	12	3	5	100
	Medium	Rupees	269785	40980	10245	20490	341500
		%	79	12	3	6	100
	Large	Rupees	451520	62084	22576	28220	564400
		%	80	11	4	5	100

PHEK	Small	Rupees	130560	19584	4896	8160	163200
		%	80	12	3	5	100
	Medium	Rupees	265044	44174	10194	20388	339800
		%	78	13	3	6	100
	Large	Rupees	438924	66672	22224	27780	555600
		%	79	12	4	5	100
ZUNHEBOTO	Small	Rupees	138240	20736	5184	8640	172800
		%	80	12	3	5	100
	Medium	Rupees	268916	40848	10212	20424	340400
		%	79	12	3	6	100
	Large	Rupees	446880	61446	22344	27930	558600
		%	80	11	4	5	100
PEREN	Small	Rupees	134560	20184	5046	8410	168200
		%	80	12	3	5	100
	Medium	Rupees	263070	39960	9990	19980	333000
		%	79	12	3	6	100
	Large	Rupees	440160	60522	22008	27510	550200
		%	80	11	4	5	100
KIPHIRE	Small	Rupees	128658	15690	4707	7845	156900
		%	82	10	3	5	100
	Medium	Rupees	262043	39804	9951	19902	331700
		%	79	12	3	6	100
	Large	Rupees	441200	66180	16545	27575	551500
		%	80	12	3	5	100
LONGLENG	Small	Rupees	126880	19032	4758	7930	158600
		%	80	12	3	5	100
	Medium	Rupees	273962	33410	10023	16705	334100
		%	82	10	3	5	100
	Large	Rupees	438213	61017	22188	33282	554700
		%	79	11	4	6	100

Source: Sample Survey

It is ascertained that, for all the districts, the cost of element-livestock(ie. acquirement of animal stock) makes the highest portion of the total amount invested. Next is cost for the element-housing in this case cattle stalls/sheds and thirdly, the cost of animal fodder. The investment cost for technical equipments for cattle management and to aid in higher productivity comprises of the least portion of investment amount. This is indicative of the fact that most farmers still prefer use of traditional implements in their farms

and very less importance is given to improved equipments for progressive farming. This trend is similar for all sizes of enterprises.

Table 5.9: Element wise Investment Per Piggery Enterprise in Nagaland.

DISTRICT	SIZE OF ENTERPRISE		ELEMENT				TOTAL
			LIVESTOCK	STY	EQUIPMENT	FODDER STOCK	
DIMAPUR	Small	Rupees	41600	26400	2400	9600	80000
		%	52	33	3	12	100
	Medium	Rupees	86700	56100	5100	22100	170000
		%	51	33	3	13	100
	Large	Rupees	137800	75400	10400	36400	260000
		%	53	29	4	14	100
KOHIMA	Small	Rupees	49680	27600	2760	11960	92000
		%	54	30	3	13	100
	Medium	Rupees	98050	57350	5550	24050	185000
		%	53	31	3	13	100
	Large	Rupees	143520	82800	8280	41400	276000
		%	52	30	3	15	100
MON	Small	Rupees	35200	19200	1920	7680	64000
		%	55	30	3	12	100
	Medium	Rupees	83160	43120	6160	21560	154000
		%	54	28	4	14	100
	Large	Rupees	127200	79200	7200	26400	240000
		%	53	33	3	11	100
TUENSANG	Small	Rupees	36720	21080	2040	8160	68000
		%	54	31	3	12	100
	Medium	Rupees	74360	45760	4290	18590	143000
		%	52	32	3	13	100
	Large	Rupees	124254	64428	9204	32214	230100
		%	54	28	4	14	100
MOKOKCHUNG	Small	Rupees	38480	25160	2220	8140	74000
		%	52	34	3	11	100
	Medium	Rupees	87980	51460	4980	21580	166000
		%	53	31	3	13	100
	Large	Rupees	139150	65780	10120	37950	253000
		%	55	26	4	15	100

WOKHA	Small	Rupees	36452	22432	2103	9113	70100
		%	52	32	3	13	100
	Medium	Rupees	80580	50560	4740	22120	158000
		%	51	32	3	14	100
	Large	Rupees	131228	74280	7428	34664	247600
		%	53	30	3	14	100
PHEK	Small	Rupees	35088	23392	2064	8256	68800
		%	51	34	3	12	100
	Medium	Rupees	80860	46650	4665	23325	155500
		%	52	30	3	15	100
	Large	Rupees	132192	68544	9792	34272	244800
		%	54	28	4	14	100
ZUNHEBOTO	Small	Rupees	35987	21049	2037	8827	67900
		%	53	31	3	13	100
	Medium	Rupees	84205	44399	4593	19903	153100
		%	55	29	3	13	100
	Large	Rupees	130518	70093	7251	33838	241700
		%	54	29	3	14	100
PEREN	Small	Rupees	33354	22890	1962	7194	65400
		%	51	35	3	11	100
	Medium	Rupees	77948	49467	4497	17988	149900
		%	52	33	3	12	100
	Large	Rupees	130680	61776	9504	35640	237600
		%	55	26	4	15	100
KIPHIRE	Small	Rupees	33000	23100	1980	7920	66000
		%	50	35	3	12	100
	Medium	Rupees	77877	51918	6108	16797	152700
		%	51	34	4	11	100
	Large	Rupees	127200	74400	7200	31200	240000
		%	53	31	3	13	100
LONGLENG	Small	Rupees	32334	21556	1902	7608	63400
		%	51	34	3	12	100
	Medium	Rupees	76700	47200	4425	19175	147500
		%	52	32	3	13	100
	Large	Rupees	127116	70620	7062	30602	235400
		%	54	30	3	13	100

Source: Sample Survey.

On the other hand, the data represented in table 5.9 shows that, the cost of element-livestock particularly (i.e acquiring animal stock), of Piggery enterprises in the state (for all the districts) makes the highest portion of the

total amount invested. Next is cost for the element-housing in this case pig sties and thirdly the cost of animal fodder. The investment cost for technical equipments for piggery management and to aid in higher productivity comprises of the least portion of investment amount. This is indicative of the fact that most farmers still prefer use of traditional implements in their farms and very less importance is given to improved equipments for progressive farming. This trend is similar for all small, medium and large sized enterprise.

MONTHLY COST AND RETURN:

Monthly cost and return is calculated from Total sale value of the product. The Total Sale value is found by taking the price of the commodity at current 2014-15 price in the particular district multiplied with the Quantity sold. Total cost deducted from total sale value gives the total returns for dairy enterprise in the particular district. There is slight variations on pricing in among the districts. District wise monthly cost and return is indicated with the calculations in the following tables.

Table 5.10: Monthly Cost and Return of Dairy Enterprises in Nagaland.

DISTRICT	Size of Enterprise	ITEMS				
		Quantity of milk sold (in litre)	Price of the milk per litre (`)	Total sale value of milk (`)	Total cost (`)	Returns (`)
DIMAPUR	Small	960	44	42240	18000	24240
	Medium	1920	44	84480	38100	46380
	Large	3120	44	137280	58940	78340
KOHIMA	Small	900	44	39600	19400	20200
	Medium	1800	44	79200	40431	38769
	Large	2925	44	128700	60820	67880
MON	Small	720	40	28800	12440	16360
	Medium	1440	40	57600	24382	33218
	Large	2160	40	86400	35231	51169

TUENSANG	Small	720	40	28800	12710	16090
	Medium	1260	40	50400	22992	27408
	Large	1980	40	79200	34752	44448
MOKOKCHUNG	Small	840	44	36960	16330	20630
	Medium	1680	44	73920	29520	44400
	Large	2535	44	111540	42281	69259
WOKHA	Small	660	50	33000	11652	21348
	Medium	1320	50	66000	22160	43840
	Large	1980	50	99000	31240	67760
PHEK	Small	720	40	28800	12992	15808
	Medium	1350	40	54600	24160	30440
	Large	2145	40	85800	38291	47509
ZUNHEBOTO	Small	600	50	30000	11430	18570
	Medium	1200	50	60000	23619	36381
	Large	1980	50	99000	33409	65591
PEREN	Small	660	40	26400	12370	14030
	Medium	1260	40	50400	22540	27860
	Large	2070	40	82800	32100	50700
KIPHIRE	Small	540	40	21600	10152	11448
	Medium	1200	40	48000	22382	25618
	Large	1962	40	78480	36891	41589
LONGLENG	Small	600	40	24000	11240	12760
	Medium	1155	40	46200	21282	24918
	Large	1890	40	75600	33918	41682

Source: Sample Survey.

NOTE:

1. Average number of milking cattle taken in calculation: Small enterprises = 3 nos., medium enterprise = 7 nos. large enterprises = 13 nos.
2. The rate per litre of milk are taken according to 2014-15 average rate in each district.
3. Milk that is consumed by the owner are not taken into consideration.

In all 11 districts of Nagaland, as per table 5.10, there is considerable returns in relation to the cost of the enterprise which shows that the farmers

get a good profit margin. This trend is found in all small, medium and large sized enterprises.

Table 5.11: Monthly Cost and Return of Piggery Enterprises in Nagaland.

DISTRICT	Size of Enterprise	ITEMS				
		Quantity of meat sold (in kg.)	Price of the meat per kg.(`)	Total sale value of meat(`)	Total cost (`)	Returns (`)
DIMAPUR	Small	80	180	14400	8800	5600
	Medium	200	180	36000	17000	19000
	Large	420	180	75600	35000	40600
KOHIMA	Small	77	180	13860	9000	4860
	Medium	192	180	34560	18000	16560
	Large	403	180	72540	38000	34540
MON	Small	67	180	12060	5000	7060
	Medium	167	180	30060	11000	19060
	Large	300	180	54000	20000	34000
TUENSANG	Small	57	190	10830	6000	4830
	Medium	142	190	26980	13000	13980
	Large	254	190	48260	22000	26260
MOKOKCHUNG	Small	73	180	13140	8000	5140
	Medium	183	180	32940	15000	17940
	Large	374	180	67320	26000	41320
WOKHA	Small	63	180	11340	5500	5840
	Medium	158	180	28440	15000	13440
	Large	300	180	54000	20300	33700
PHEK	Small	60	200	12000	6500	5500
	Medium	150	200	30000	12000	18000
	Large	290	200	58000	23000	35000
ZUNHEBOTO	Small	55	180	9900	5400	4500
	Medium	137	180	24660	10500	14160
	Large	270	180	48600	21000	27600
PEREN	Small	50	180	9000	6620	2380
	Medium	125	180	22500	12800	9700
	Large	263	180	47340	22000	25340
KIPHIRE	Small	53	200	10600	5840	4760
	Medium	133	200	26600	10800	15800
	Large	268	200	53600	20000	33600

LONGLENG	Small	48	200	9600	5620	3980
	Medium	120	200	24000	10000	14000
	Large	252	200	50400	20000	30400

Source: Sample Survey.

NOTE:

1. Average number of pigs taken in calculation: Small enterprises = 8 nos., medium enterprise = 22 nos. large enterprises = 42 nos.
2. The rate per kg of meat is taken according to 2014-15 average rate in each district.
3. Meat that is consumed by the owner are not taken into consideration.

In all 11 districts of Nagaland, as per table 5.11, there is considerable returns in relation to the cost of the enterprise which shows that farmers get a good profit margin. This trend is found in all small, medium and large sized enterprises.

RETURN ON INVESTMENT:

Financial viability of a business enterprise can be examined from the view point of return on investment. The viability of Dairy and Piggery enterprises, under study is examined here by calculating the return on investment for the districts in Nagaland and for all the sizes of enterprises separately . Also the calculated data for all 11 districts of Nagaland is provided. A period of one year is taken into consideration for the calculation.

Return on investment is calculated in the following way:

$$\text{Return on Investment} = \frac{(\text{Monthly Returns X } 12)}{\text{Total Investment}} \text{ X } 100$$

Where, Total Investment = (Monthly Cost x 12) + Start up Investment

Table 5.12(i): Returns on Investment of Dairy Enterprises in Nagaland (in%).

DISTRICT	SIZE OF ENTERPRISE		
	SMALL	MEDIUM	LARGE
DIMAPUR	72	68	72
KOHIMA	56	55	61
MON	63	63	63
TUENSANG	63	54	55
MOKOKCHUNG	65	75	76
WOKHA	84	87	87
PHEK	59	58	56
ZUNHEBOTO	72	70	82
PEREN	53	55	65
KIPHIRE	49	51	50
LONGLENG	52	51	52
AVERAGE	**62.55**	**62.45**	**65.36**

Source: Sample Survey.

Return on Investment for Dairy enterprises on an average is lowest for medium enterprises at 62.45% and highest for large enterprises at 65.36% .

- Return on investment for small size enterprises is lowest in Kiphire at 49% and highest in Wokha at 84%.
- Return on investment for medium size enterprise is lowest in Kiphire & Longleng at 51% and highest in Wokha at 87%.
- Return on investment for large size enterprise Return is lowest in Kiphire at 50% and highest in Wokha at 87%.

Table 5.12(ii): Returns on Investment of Piggery Enterprises in Nagaland (in %).

DISTRICT	SIZE OF ENTERPRISE		
	SMALL	MEDIUM	LARGE
DIMAPUR	36	61	72
KOHIMA	29	50	57
MON	68	80	85
TUENSANG	41	56	64

MOKOKCHUNG	36	62	88
WOKHA	51	48	82
PHEK	45	72	80
ZUNHEBOTO	41	61	67
PEREN	19	38	61
KIPHIRE	42	67	84
LONGLENG	37	63	77
AVERAGE	**40.45**	**59.82**	**74.27**

Source: Sample Survey.

Return on Investment for Piggery enterprises on an average is lowest for small enterprises at 40.45% and highest for large enterprises at 74.27%.

- Return on investment for small size enterprises is lowest in Peren at 19% and highest in Mon at 68%.
- Return on investment for medium size enterprise is lowest in Peren at 38% and highest in Mon at 80%.
- Return on investment for large size enterprise is lowest in Kohima at 57% and highest in Tuensang at 88%.

RETURN ON SALES:

Financial viability of a business enterprise can also be examined from the view point of Sales. The viability of Dairy and Piggery enterprises, under study is examined here by calculating the return on sales for all the sizes of enterprises separately . Also the calculated data for all 11 districts of Nagaland is provided. A period of one year is taken into consideration for the calculation.

Return on Sales is calculated using the following formula:

$$\text{Return on Sales} = \frac{(\text{Monthly Returns} \times 12)}{(\text{Total Sales} \times 12)} \times 100$$

Table 5.13(i): Returns on Sales of Dairy Enterprises in Nagaland (in %).

DISTRICT	SIZE OF ENTERPRISE		
	SMALL	MEDIUM	LARGE
DIMAPUR	57	54	57
KOHIMA	51	49	53
MON	57	58	59
TUENSANG	56	54	56
MOKOKCHUNG	56	60	62
WOKHA	65	66	68
PHEK	55	56	55
ZUNHEBOTO	61	61	66
PEREN	53	55	61
KIPHIRE	53	53	53
LONGLENG	53	54	55
AVERAGE	**56.09**	**56.36**	**58.64**

Source: Sample Survey.

Return on Sales for Dairy enterprises on an average is lowest for small enterprises at 56.09% and highest for large enterprises at 58.64% .

- Return on sales for small size enterprises is lowest in Kohima at 51% and highest in Wokha at 65%.
- Return on sales for medium size enterprise is lowest in Kiphire at 53% and highest in Wokha at 66%.
- Return on sales for large size enterprise Return is lowest in Kohima and Kiphire at 53% and highest in Wokha at 68%.

Table 5.13(ii): Returns on Sales of Piggery Enterprises in Nagaland (in %).

DISTRICT	SIZE OF ENTERPRISE		
	SMALL	MEDIUM	LARGE
DIMAPUR	39	53	54
KOHIMA	35	48	48
MON	59	63	63
TUENSANG	45	52	54
MOKOKCHUNG	39	54	61
WOKHA	51	47	62

PHEK	46	60	60
ZUNHEBOTO	45	57	57
PEREN	26	43	54
KIPHIRE	45	59	63
LONGLENG	41	58	60
AVERAGE	**42.82**	**54.00**	**57.82**

Source: Sample Survey

Return on Sales for Piggery enterprises on an average is lowest for small enterprises at 42.82% and highest for large enterprises at 57.82% .

- Return on sales for small size enterprises is lowest in Peren at 26% and highest in Mon at 59%.
- Return on sales for medium size enterprise is lowest in Peren at 53% and highest in Mon at 63%.
- Return on sales for large size enterprise Return is lowest in Peren and Dimapur at 53% and highest in Mon and Kiphire at 63%.

It is ascertained from the present study which considers return on investment and return on sales, calculated for a period of one year that both Dairy and Piggery enterprises are getting a reasonable price for their products and considerable high income when compared to the cost involved for production. The return on Investment for Dairy and Piggery enterprises is found to be 62.45% to 64.00% and 40.45% to 72.82% respectively. The Return on Sales for Dairy and Piggery enterprises is found to be 56.36% to 58.64% and 42.82% to 57.91% respectively. The return on investment shows more fluctuation in average percentage returns for different sized enterprises but ultimately indicates more returns/income for the enterprise. The Return on sales is comparatively lower but shows similar average percentage of returns for small, medium and large sized enterprises. However, since the dairy and piggery enterprises under study here are commercial enterprises, therefore, to find the actual return/income on business terms, return on sales is considered. The entrepreneurs are therefore, making substantial profit though having to put a lot of human labour hours and in case of piggery enterprises making profit only after 7-8 months when the pigs reach their full growth potential. It is to be noted that in profit calculation, mortality of animals also needs to be

taken into consideration though mortality rate can be reduced greatly with mass vaccination and de-worming. Some of the enterprise owners listed non-remunerative price as among the important economic constraint, yet, it is found from study that this constraint is basically a psychological one which comes from the seller's instinct to get high price for his/her products. However, the entrepreneurs do need to have a fixed capital amount for investment before venturing into these enterprises, more specifically, investment bulk amount for buying the animals and for housing infrastructure. Study indicates that most farmers still use traditional implements in their farms and very less importance is given to improved equipments for progressive farming . Knowledge about the constraints of the enterprises need to be identified and then removed/solved to make dairying and piggery more attractive to the State's entrepreneurs. The farmers need to be more open minded and have a ready mind set to actively involved in progressive farming. The assessment of all data and findings resolved from the information gathered has confirmed that the dairy and piggery enterprise albeit constraints found, brings in profit of an average of around 55%. These enterprises therefore, have ample scope and are economically viable for the state of Nagaland particularly for rural economy.

CHAPTER VI

PROBLEMS OF DAIRY AND PIGGERY ENTERPRISES AND THEIR PROSPECTS

North Eastern Region of India is endowed with one of the most diverse bio reserves in the world and is one of the few remaining areas in the country with large forage covering. Like other North Eastern States, Nagaland is inhabited by tribal communities which are mostly non-vegetarian and hence, the demand for animal protein is much more, compared to other parts of the country. The small scale dairy and piggery sector occupies an important position in farming system as it is closely interlinked with the other agricultural operation performed by the tribal people for their livelihood. Pig alone accounts for 55.38% of the total livestock population in Nagaland, but still a wide gap exists between the demand and availability of pork mainly due to traditional production system. The total milk production in Nagaland is only 81000 tonnes in 2013-14 and shows a slightly decreasing trend. The per capita availability of milk in Nagaland in 2013-14 period is 95gm/day which is far below the national average of 307 gm/day for the same period. Dairy animals are usually kept for milk consumption requirement of the family and in some cases for draught- animals for plough'ing in the fields. Surplus production of milk and its products are not common. Rural families usually keep an average of 1-2 indigenous or crossbreed pigs for fattening with zero to minimum inputs in terms of family labour and feeding. Only few farmers keep their pigs for breeding purposes. In the case of cows, since they are capital intensive, not all families can afford to rear them and families owning cows are not much in comparison to pigs.

Due to remoteness and inaccessibility, the rural hill farmers of NER has evolved a self-sustainable local resource based production system, in which cattle/buffaloes/pigs are mainly dependent on local vegetations, crop residues and kitchen waste and easily available fodder in nearby forests. Although, this system has been followed generation after generation, further improvement is required to augment the productivity. Several reports highlighted that the main purpose of keeping cows was for domestic milk consumption and pigs

was to obtain emergency cash and/or meeting consumption in festive season. In spite of several opportunities in rural areas, the dairy and pig entrepreneurs/farmers faces several challenges due to lack of quality germplasm, high feed cost, poor health care service in daily operation and devoid of any breeding strategies. The scientific intervention in improvement of genetic resources, management and breeding practices is vital for further improvement in existing production system for transforming the subsistence pig farming to a profitable enterprise. In this perspective, efforts taken by Indian Council of Agricultural Research to initiate Mega Seed Project on Pig with very basic objective of making availability of quality pig germplasm with superior genetic merit in terms of growth and reproduction at farmer's door steps in order to encourage cross breeding. Besides production of germplasm, capacity building programmes for dissemination of improved production techniques and artificial insemination to facilitate breeding have been taken as collateral activities in promotion of pig based entrepreneurship development. The state has also started 5 cattle breeding farms and State department has started initiatives in encouraging co-operatives and self help groups to augment milk production and development. However, the various schemes and programmes are not being efficiently followed and implemented and faces problems in reaching farmers in far flung remote areas.

The state of Nagaland covers an area of 16579 sq. km and lies between $25^{o}6$'N and $27^{o}4'N$ latitude and between the longitudinal lines $93^{o}20'$E and $95^{o}15'$ East. Nagaland forms a part of the Eastern Himalayas and lies in the extreme northeastern part of India. Topographically, the state of Nagaland is mountainous and the altitude varies between approximately between 194 meters and 3084 meters above sea level . Many villages stand at 1000 to 2000 meters and 3048 meters above sea level. The Naga villages are usually situated on the hilltops and at higher altitude for logistic reasons. According to latest 2011 census, the state has a population of 19,80,602. More than 70%

of the population live in rural areas and the density of population is 119/per sq. km. Being incorporated into the Union of India in 1st Dec 1963-much after Indian Independence, the state has not been able to be a part and grow along with the nation for many years. Nagaland continues to be a deficit state and is still heavily dependent on central grants for survival. Relative isolation, political unrest, indifferent attitude of governance are responsible for low investment, low production and welfare. The remoteness and mountainous terrain has hampered infrastructural development like the construction of roads and railway connections in the region; eventually leading to slow growth of development. Thus, there are hardly any basic industries/major companies and the infrastructural development of the state is far behind other states in mainland India. The list compiled from the Annual report of Reserve Bank of India (2013) with rank calculated according to the percentage of people below poverty line based on MRP consumption, Nagaland ranks at 16th with 18.88% of people still under poverty line while national average stands at 21.92%. The economy of Nagaland is predominantly agro- based and involves around 70% of the working population though the performance of the sector is still disheartening mostly on account of following traditional practices of farming. Agriculture and forestry contribute majority of Nagaland's Gross Domestic Product and majority of the state's population depends on agriculture and allied activities for their livelihood security and employment. The contribution of agriculture sector to Net State Domestic Product (NSDP) was recorded at 34.91% in 2005-06 and is a major contributor to the state's economy. Cultivation of crops itself is seasonal and in lieu of limited alternatives available to the farmers to supplement agriculture output, Animal Husbandry/ Livestock production is a vital economic activity in Nagaland. The main concern is to arrange for steady flow of income throughout the year and if the income can be generated through a process of recycling of the inputs, there is nothing like it. Therefore,

livestock are kept, so that, the domestic waste, crop wastes, grain residues and grasses can be converted to either milk or meat, while the animal wastes can again be used to supply essential plant nutrients thus making dairy and piggery enterprises viable. There is ample scope for rural enterprises and employment opportunities through avenues of animal husbandry like dairy and piggery.

Dairying and Piggery on a large scale/ commercially is a new concept in Nagaland and is yet to gather momentum and the farmers face different problems including scientific and technological backwardness, capital formation/support, availability of feed, supply of good breed, medical/health and marketing issues, etc. These factors are responsible for high mortality rate among young, late maturity, low yield, longer service period and dry period, low immunity to disease attacks and a number of reproductive problems. High prevalence of endemic diseases, capital shortage and lack of knowledge were sighted as the main challenges that hindered farmers from adopting Dairy and Piggery enterprises in the state. Heavy dependence on natural pastures with limited avenues for conservation and animal supplementation characterized by free range and tethering management practices by smallholder farmers will eventually lead to ecosystem imbalance. A wide range of quotas, marketing boards and legislation governing agriculture impose complicated limits and often require significant resources to navigate. For the small farmers venturing into commercial entrepreneurship, apart from many other constraints, there have arisen pressures from all sides: food safety, environmental, industry marketing. However viable Dairy and Piggery farming may be in relation to other industries in Nagaland, the farmers undertaking these enterprises faces many constraints and problems some of which are endemic/particular to the state.

The under mentioned problems of Dairy and Piggery enterprises are found in the State during the period of my research study which can be discussed as follows:

Economical Problems:

Nagaland has around 19% of population living below poverty line, mostly concentrated in rural areas. The farming communities are from economically weaker/ poor with small land holdings. This acts as a hindrance for them to not invest in high producing animals and is the reason for not providing proper sheds to protect their animals from environmental stress. They also do not have enough to spare on animal health care. Financial barriers prevent small farmers from intensifying their production. The investment required often exceeds their capital wealth more so in case of Dairy enterprise. One of the ways to limit capital requirement for buying dairy cattle would be acquiring calves at lower price than the full grown milking cow thus less start up investment. In this method, patience is required on the part of the farmers in waiting for about 2years until the animal can start giving milk and it is more time intensive. However, in relation to the life span of milking cow which sometimes is more than 25 years the production and returns is marginally high. The rural people prefer domestic backyard farming of animals for family use though it would result in low output because it requires low input. They cannot economically field the production, market and transaction cost for commercial ventures. Transaction costs can be prohibitively high for small-scale producers because of the small quantities of marketable product and the absence of adequate physical and market infrastructures in remote areas. Transaction costs are also increased where producers lack negotiating power or access to market information, and remain dependent on intermediaries. Public policies are needed to develop market infrastructures, including appropriate information systems enabling small-scale producers to make informed marketing decisions. Producers'

associations or cooperatives enable producers to benefit from economies of scale by reducing transaction costs. Production risks arise from resource degradation, extreme weather events such as droughts and floods, and disease outbreaks. Both small-scale and intensive livestock production systems are at risk from the ravages of epidemic diseases and droughts, but the rural poor are particularly vulnerable to these types of shocks because of their limited assets and the lack of insurance schemes.

Financing/Credit:

Livestock farming constitutes the livelihood of rural poor belonging to the lowest socio-economic strata and they have no means to undertake scientific dairy and piggery farming with improved foundation stock, proper housing, feeding and management because of capital constraint. Therefore, suitable schemes and subsidies to popularize the scientific breeding cum rearing of High Yielding Variety (HYV) dairy animals and meat producing animals with adequate financial provisions are necessary to modernize the dairy and piggery industries and to improve the productivity of small sized rural farms. Larger farms today often rely on lines of credit, typically from banks, to purchase the required equipments and other supplies needed for each production year. These lines are heavily affected by almost all of the other constraining factors. Besides car loan, housing loans to government employees and life insurance schemes, banks in Nagaland do not show any interest in dealing with the local populace especially the small time farmers for loans or credits. Majority of the farming community in Nagaland is small and marginal. They do not have access to easy credit from the banking institutions on account of requirement of government employed guarantor , as a result of which they are compelled to continue with small scale household production system. Banks should adopt more farmer friendly attitude and faithfully implement GOI schemes to benefit the rural majority state of Nagaland. Policies and institutions must facilitate forms of targeted small- to

medium-scale credit to ensure the poor's future involvement in increasing livestock production and processing.

Feed:

According to sample survey, feed constitute around 60% and 70% of cost of production for dairy and pig enterprises respectively and therefore a carefully planned feeding programme is important for successful dairy and piggery enterprises and feeding management structure should be economical and efficient. Feed plays an important role for success in both dairy and piggery enterprise and enhancement of all cattle and pig products production but this has been sadly neglected. Survey shows that livestock producers are almost entirely dependent on their own resources of feed. Availability of compound feed is also limited to the government breeding farms and the high cost of feed is one of the most major reason why farmers prefer breeding pigs with traditional localized feed sources. A complete diet for pigs and cattle includes proteins, carbohydrates, fats, minerals, vitamins, and ample good water and all these nutrients are required in proper amounts and proportion. Pigs are the most rapidly growing livestock but in comparison to other animals, it suffers most from nutritional deficiencies. Waste of both animal and vegetable sources can be utilized by the piggery and dairy enterprises for feeding-although cattle are herbivorous, pigs on the other hand are omnivorous animals. Cattle and pigs in Nagaland are domestically reared with feeds such as; rice bran from the mills, kitchen waste, maize, pumpkin, vegetables and variety of wild jungle vegetation. All local pig farmers trying to organize piggery units in Nagaland highlight one common issue, “Feed cost is too high, and profit margin is less”. Subsidized rate on feed should be worked out for local farmers . Natural pastures, domestic waste and crop residues were reported as the most common animal feeds in the state and during dry season, feed shortage is common. Balanced feed at reasonable price is must for the Dairying and piggery industry. Availability of the

formulated balanced nutritional feed within close proximity of the production centers is also a requisite. Lack of feeds in general and particularly in dry seasons causes a big challenge to livestock production in the NER. This mainly results from over reliance on natural pastures coupled with limited supplementation of ruminants as seen in this study. The major constraint identified was lack of adequate feed in the required quantity and quality particularly during the dry season. More than 60% deficiency in concentrate feed sources is a threat to the dairy and piggery enterprises production as in rural areas it results in competition with human for food grains, human consumable green vegetables etc.

Record / data keeping:

Since dairy and piggery enterprises in Nagaland are predominantly domestic enterprises in rural areas there is no system of keeping records. Most farmers in rural villages are illiterate and thus keeping written record/data of their enterprise is improbable. This makes it difficult to find any data reference for application of better yield/production except through oral sources which are difficult to ascertain. There is no planned and intensive data collection from any other source except the basic livestock population, production and consumption data from the State Veterinary and Animal Husbandry department. Also, slight variations have been found in state's department data of different periods and between the state and the country's data. Systematic and correct record/data keeping helps to compare between animal breed production, reproduction, health potential and performance helping the farmers to choose better yielding / genetically superior breeds. Record keeping helps in faster and more accurate analysis of various farm activities and better planning and management. A large area specific work still remains concerning the clear cut prediction of animal growth, body composition, feed requirements, the outputs of waste products from the animal and production costs. To ensure a high degree of consistency and

uniformity in content coverage and presentation and improved collection of data, third party agencies can be employed on contract basis. Such work could go a long way to help improve the efficiency of livestock production and meeting the expectations of consumers and the demands of regulatory authorities.

Industrial/Infrastructure Constraint:

The industrial base in Nagaland is narrow and the case of dairy and piggery sector here is no different. There is hardly any organized industrial set-up to assist in the growth of production or development, except a few for milk procurement and sale aided by the government. Technical barriers prevent small producers from supplying a safe and relatively uniform product to the market. The lack of appropriate infrastructure to preserve perishable products affects the negotiating power of small production units, particularly if they are distant from consumption centres. The majority of units/village industries are based on local agro-products, forests products, livestock and domestic cottage industries. The State government has established six growth centers for industrial development, however, they have not been able to satisfactorily meet the objectives for which they are envisioned. The paper mill established at Tuli in Mokokchung district and the sugar mill in Dimapur faced serious difficulties. The sugar mill has since been closed down. The industrial development in the state is mainly repressed by the state's physical and political isolation. Moreover, poor transportation infrastructure is another reason for its curtailment. New initiatives are necessary after careful survey of development potentials of specific areas in the state. Non-availability of by-product utilization facility in rural areas for dairy and piggery sector, particularly where pig concentration and slaughter is maximum, is another threat to the public health point of view. There is also no housing management facilities and farmers use locally available construction materials

for stalls. Availability of animal production technologies for faster development and effective implementation is a requisite.

Topographical constraints:

Nagaland is a hilly state and lies in the south-eastern part of the Himalayas. The rugged terrain of the region has been one of the main constraints to development in all sectors. The inaccessibility hampers the delivery of various services to the farmers. The cost of making infrastructures required is also high mostly because of high transportation cost of building materials. Good roads and communication are key to development as without them proper and economical management of enterprises is not possible. The transport network in the region is in poor shape and therefore rural people face impediment for market reach of their products. Topographical constraints push rural farmers preference to market their commodity within their locality which does not bode well for commercialization of the dairy and piggery sectors.

Nutrition:

Nutrition is the most important constraint to convert the present subsistence to market oriented production for both dairy and piggery sector. The traditional system of feeding involves feeding a wet slop made up of different forages collected from the forests (abundant in the wet season but scarce in winter) combined with garden and kitchen waste all cooked with firewood. Purchased wheat/rice barn and also maize, low quality rice, tuberous plants are mixed in the feed by the farmers. Feeding of balanced concentrate is not followed and is not popular. Different classes of dairy animals/pigs respond differently to different diets hence one has to know nutrient requirement of the particular breed at specific age. A large agenda of work still remains concerning the robust prediction of animal growth, body composition, feed requirements, the outputs of waste products from the

animal and production costs. Such work could go a long way to help improve the efficiency of livestock production and meeting the expectations of consumers and the demands of regulatory authorities. Poor nutrition is one of the major production constraints in smallholder systems. Another key driver that will affect livestock nutrition is the need to mitigate greenhouse gas emissions. Improved feeding practices (such as increased amounts of concentrates or improved pasture quality) can reduce methane emissions per kilogram of feed intake or per kilogram of product, although the magnitude of the latter reduction decreases as production increases.

Availability of quality cattle/sows/boars:

Another problem faced by the farmers is the availability of quality cattle/ sows and boars. The indigenous breed normally available, though less labour intensive and more adaptable to the harsh conditions of Nagaland, have very less yield of milk and meat. The calves/piglets are mostly procured from local market/neighbours and in few cases, people collect them from the few organized state breeding farms. Absence of sufficient number of breeder farmers/farms in Nagaland is the reason why sufficient numbers of quality pigs are not available for the fattener farmers as well as in the market. There is also non-availability of good quality animals in nearby livestock markets/ breeding farms. Improved breed are not readily available except in some pockets and are mostly brought from other states especially for dairy animals. Thus, to buy and bring them to the farm is time consuming and involves higher cost because of transportation cost.

Marketing:

Though there is huge demand of dairy and piggery products, hygienic concern and its storability has restricted marketability and export avenues. There is lack of regulated market and retail chains to sell the produce at a profitable price. There does not exists any proper market linkages in rural

areas. The livestock produced at rural areas are mostly consumed locally and not much surplus is left. On many occasions, farmers resort to distress sale of their produce due to infrastructural constraint and lack of proper market channel for perishable produce. Market related constraints include poor transportation infrastructure thus high cost, market avenues located at distant place from production area of farmers, involvement of middlemen in selling of produce, lack of co-operatives or associations etc. There is no organized or planned wholesale market for dairy and piggery products in the state. Integrated structure for livestock marketing through regulated markets is required. The promotion and distribution channel is very unorganized and almost non-existent in the rural areas. For live pig sale, the body weight of adult animal is measured in weighing balance only after slaughtering the animal or by assuming the weight by visual observation following indigenous method. These practices mostly results in farmers not getting the best remuneration from the sale.

Lack of medical facilities:

There is lack of veterinary services/facilities and animal health experts for proper and timely treatment of sick animals. Limited availability of swine fever vaccination and emergence of new animal diseases like Porcine Reproductive Respiratory Syndrome (PRRS) and scores of parasitic infection is another threat for livestock production. The vaccination against commonly occurring diseases is practiced only by few progressive farmers. The majority of the farmers used to treat the sick animals by themselves using locally available herbs or medicine from local dispensary. Veterinary services in most of the part in Nagaland are very poor and only 10% farmer consult veterinary practitioners for any emergency. The sick animals are often slaughtered for home consumption or in unorganized roadside markets. Animals, to reach full growth potential require proper feed management, protection against diseases via. timely vaccination, disinfection, deworming,

treatment and isolation facilities during disease outbreak, proper sanitation etc, Breeding care, care during pregnancy and calves and piglets care is also paramount. There is also the problem of general decline in the quality of veterinary services and poor health care service in daily operation. A difficulty in assessing the changing disease status in much of the developing world is the lack of data, a critical area where progress needs to be made if disease diagnostics, monitoring and impact assessment are to be made effective and sustainable.

Lack of Professionals/Skilled human resource:

Lack of professionals and sufficient data to advise or provide adequate knowledge on viability of dairy and piggery enterprises. Organized processing, packaging and management of enterprises all require professionals in the concerned field for proper development and growth resulting in right kind of products delivered to consumers with safety and at affordable price. Thus, expert professional help is requisite for pragmatic approaches to efficient livestock production and utilization to sustain livestock production activities. Training on low cost production technology, modern husbandry practices together with knowledge of zoonotic diseases and its prevention, in order to produce good quality pork to fetch better market price techniques is prerequisite. With Scientific intervention in operational techniques through proper capacity building program by professionals with the help from Government or NGOs, the problems of the farmer can be minimized. Lack of availability of professional consultants/skilled human resource in dairy and piggery enterprises of Nagaland creates a blockade for modernized development of the sectors.

No Organizations/Association Support:

There is no proper support system for rural dairy and piggery farmers. More effective association of farmers, producers and commercial enterprises should be formed to develop healthy competition, to provide a forum for exchange of experiences, information and technologies. At present, there are no strict rules or quality standard to adhere to in the State, thus making quality an ethical decision of individual farmers. Lack of adequate support from the development and financial bodies to establish dairy and pork based industries is hindering the growth to the desired extent. Besides, state affiliated training centers at NDSCF 'Lirie" and ICAR 'Medziphema', there are hardly any commendable source and availability of training facilities. In the absence of supportive organizations in and around the areas inductive to growth of dairy and piggery enterprises, by-product utilization suffers a setback for which economic return is less.

Land Availability:

The area for grazing and growing fodder is also reducing with deforestation and the source of fodder procurement is slowly becoming farther off thus resulting in more expenditure on feed procurement. Excessive grazing pressure on marginal and small community lands is leading to complete degradation of land. The growth of urban centers around the world and the resulting urban sprawl have caused the price of centrally located farmland to skyrocket, while reducing the local infrastructure necessary to support farming, putting effectively intense pressure on many farmers to sell out. Dairy and Piggery enterprises should preferably be located a bit farther off from general human habitation and needs large tracts of area for eventual successful growth. With increase in population, land area available for farmers to maintain their enterprises is reducing. External pressures are being brought to bear on traditional open-access grazing lands such as increasing

population density and increasing livestock–wildlife competition for scarce resources.

Animal health issues :

Endemics and epidemics are common and spread very easily in the state due to shortage of medical infrastructure and professionals. Farmers reported various pests and diseases encountered in the different livestock species which was a major impediment for growth. Malnutrition and hygiene issues are paramount in all local farms which makes the animals susceptible to many diseases. Male piglets not selected for breeding should be castrated in hygienic conditions preferably within 3-4 weeks which will prevent the boar odour in the cooked meat enabling production of quality meat. Technical barriers exist in the form of sanitary requirements (including animal welfare) as a prerequisite to trade. Perceived or real livestock disease incidence may exclude groups of farmers or whole countries from international, regional and local markets. Infectious and parasitic diseases of livestock remain important constraints to more productive and profitable livestock production in many developing regions. Diseases reduce farm incomes directly and indirectly: directly, by causing considerable losses in production and stock as well as forcing farmers to spend money and labour on their control; and indirectly by the consequent restrictions on exports. Infectious diseases such as rinderpest, foot-and-mouth disease, contagious bovine pleuropneunomia, classical and African swine fever and peste des petits ruminants are still major threats to livestock production in developing countries. Through increased movements of livestock, livestock products and people, they also threaten production in industrial countries. From a production viewpoint, helminthosis and tick-borne diseases are particularly important. Intensification of livestock production is thus going to face growing constraints both from epidemic and endemic disease agents. Disease trends could be heavily modified by climate change. This has obvious implications for policy-makers and livestock

industries, and raises the need for improved diagnosis and early detection of livestock parasitic disease, along with greatly increased awareness and preparedness to deal with disease patterns that are manifestly changing. Potentially effective control measures in recent years have seen various advance in technology to detect diseases and set up planned steps for cure but in Nagaland there is no proper facilities and manpower for implementation.

Government Policies & Assistance/Government economic intervention:

In some countries, notably the US government gives subsidies to farmers, intended to mitigate the impact on domestic farmers of economic and political activities in other areas of the economy, can be significant source of farm income. Bailouts, when crisis such as drought or the "mad cow disease" problems hit agricultural sectors, are also relied on. The governmental programmes and policies, which were framed for development of livestock, should be region specific and the development potentials and constraints be considered. The traditional farming systems on undulating and marginal slopes of mountain areas are characterized with poor natural resource bases. The crossbreeding policies would have taken environment into account, in which animals had to live and produce and as well as the knowledge of livestock herders and their strategies in response to the changing biophysical and socioeconomic situations. Besides, little attention has been given to mobilizing local people and herders to strengthen their capacities. Inaccessibility, marginality, fragility, niche, and diversity characterize most mountain areas. There is a vital need to frame policies and their implementation for livestock development, considering the conservation of biodiversity both floral and faunal species. It has been observed that indigenous species of livestock are more adaptable to the fragile mountain environments than the crossbreed one. Their potentials for economic enhancement of the region have yet to be utilized. A systematic study,

keeping a better understanding of livestock development processes in relation to improving the livelihood of mountain farmers, agro-ecosystem, health, and natural resources in view, is indeed inevitable. Policies and institutions must facilitate access to technologies, goods and services, and encourage the establishment of product standards and safety norms that do not exclude smaller producers, yet do not compromise public health.

Administration & Management Problems:

Dairy and Piggery enterprises in Nagaland is usually a secondary occupation and hence attention is not paid for proper management. Management practices followed are traditional which results in weakness in animals and adversely affects their overall efficiency. Proper housing and feeding management is also not followed. The lackadaisical attitude of the state administration also results in slow implementation of schemes and programmes.

Certain policies of taxation/control should be imposed on imported meat to increase state's revenue, encourage entrepreneur ventures in the dairy and piggery sector, improve localized market products and limit the import into the state. The state quality inspection bodies should be more sincere and diligent in carrying out their duties.

Knowledge Base:

The farmers of Nagaland practice traditional farming, have low education with weak scientific and technological knowledge . They do not have knowledge of advanced scientific breeding(A.I), feeding or advanced means of sourcing by-products/value added products from the animals. The bovines/pig owners get their pig to conceive with any nearby locally available male stock irrespective of the breeding value of sire. The farmers have to be empowered in terms of improved technology and scientific knowledge. Until now, the improved technological advancement have not reached the grassroot

farmers. The farmers are following their own traditional mode of production which leads to low yield and is not economically viable. There is lack of functional literacy and proper communication, inadequacy of publications and enterprise literature. Training and awareness on animal health management, feeding habits and value addition of animal products would benefit the rural farmers. The farmers have hardly any knowledge on the modern established scientific practices and skills for better management of their animal farms.

Breed:

There is lack of progeny of high yield breed of cattle, buffaloes and pigs and A.I services are not available to a large section of the state. The genetic potential of native breeds of cattle, buffaloes and pigs has low yield/production of milk and meat. The local naga consumer's preference for pork from local pig is a problem in promotion of improved meat with lean meat quality. Many households rear crossbred pigs in intensive system at the backyard. People mostly prefer the black colour, short snout pig as they are less affected with skin infections. The breed like Large Black cross, Burmese Black and Hampshire cross are popular in the region. The indigenous Naga Local pig is still preferred with the tribal farmers in remote districts in Nagaland. Some of the rural people still prefer to rear local cattle/pig over crossbreeds or exotic because the local animals adapt to local feed sources and performs well on poor quality roughage and agricultural residues and more efficient at converting roughage to body weight. Local animals are also more resistant to prevailing diseases unaffected by weather extremes than the exotic breeds which are more susceptible to prevailing diseases and vulnerable to weather extremes. For Exotic/Crossbreed cattle/pigs veterinary support services is also mandatory and high input especially in housing and feeds is necessary to reach full growth/yield potential, resulting in high input cost. Breed substitution or crossing can result in rapid improvements in productivity, but new breeds and crosses need to be appropriate for the

environment and to fit within production systems that may be characterized by limited resources and other constraints. The present study shows that though, animal population shows a decreasing trend, the rearing of cross breeding and HYV of animals are increasing. High-performing rates of genetic change have increased in recent decades in most species developed countries for several reasons, including more efficient statistical methods for estimating the genetic merit of animals, the wider use of technologies such as artificial insemination and more focused selection on objective traits such as milk yield and meat production.

Social Constraints:

North East India is generally considered one of the most challenging regions of the country to govern due to its topography, traditional customary laws and high prevalence of separatist movements . Nagaland has experienced untold hardships under occupational forces since the 1950s. The political unrest, violence and insecurity have long limited Nagaland's economic development. In the last 15 years, the state has seen less violence and annual economic growth rates nearing 10% on a compounded basis, one of the fastest in the region. Shifting cultivation is widely prevalent in the region which leads to land and environmental degradation and reduction of grazing land and forests for fodder. In some cases even residences or whole community has to shift en masse to the next cultivable land areas. Productivity in those areas get affected. Tendency of dairy and piggery farmers of Nagaland to raise dairy animals and pigs to marketable age on zero to negligible inputs effects the quality. For intensive Dairy and Piggery farming there has to be a proper land tenure system which inculcates among the farmers a sense of belongingness to the land. An established village, more often than not comprises of compact cluster of population, residing together in a given area as a close knit community and traditionally sharing the land resources; this restricts free land use and limits commercial large area farming. However, the

Naga ‘Sumi’ community shows an impressive growth in livestock farming by following the exemplary forward thinking tendency of setting up smaller settlements/villages at certain distances from each other thus solving space constraints; this tends to be very conducive to land intensive industry growth like dairy and piggery enterprises. There is also serious disconnect between science and public perceptions. Marked distrust of science is a recurring theme among the Nagas in rural areas who are reluctant to leave the traditional way of animal farming for the advanced scientific methods like artificial insemination or genetic modification. One of several key reasons for this distrust is a lack of credible, transparent and well-communicated risk analysis associated with many of the highly technological methods. The mainland agriculture is characterized by steep slopes, shallow fertile soils, nutrition deficiency, and terraced cultivated fields. Under such conditions, growing quality fodder crops is extremely difficult. Marginal farmers therefore depend more on Community lands such as forests and wastelands, for livestock rearing and getting economic benefits out of the free access to feed source. The traditional small scale system followed by rural farmers is characterized by high mortality rate, low yield, veterinary support absence or minimal health care, supplementary feeding and improper housing.

PROSPECTS OF DAIRY AND PIGGERY ENTERPRISES:

Livestock have multiple roles in human society. They contribute substantially and directly to food security and to human health. For poor and under-nourished people, particularly children, the addition of modest amounts of livestock products to their diets can have substantial benefits for physical and mental health. Livestock's contribution to livelihoods, particularly those of the poor in developing countries, is also well recognized. Livestock generate income by providing both food and non-food products that the

household can sell in formal or informal markets. Hides and skins from home-slaughtered animals are rarely processed, as the returns may not justify the costs involved. Livestock sector is poised for revolution where the major increase on milk and meat are anticipated. Meat based fast food industries are increasing at a rapid pace, the shift in food consumption pattern from cereals to dairy and meat products is gaining prominence especially in the growing middle class with high purchasing power. Globalization promises a wealth of product choices and product value for the consumers. The demand for convenience meat based fast food is ever increasing due to rapid industrialization and urbanization, higher standards of living and increasing number of working women. Rising literacy and increasing health awareness also influence the purchasing pattern and food changes in food habits of the consumers. The projected growth in the demand for animal products therefore offers opportunities for the rural poor since they already have a significant stake in livestock production. Unfortunately, until now the large majority of the rural poor have not been able to take advantage of these opportunities. Thus far, the main beneficiaries have been processors and traders, middle-class urban consumers, and a relatively small number of large producers in high-potential areas with good access to markets. Human requires nutritional fulfillment by milk and meat which gives an added advantage to the dairy and piggery enterprises especially in Nagaland, where the scope of growth for the said enterprises are high and positive. Value addition and diversification of dairy and piggery products increases the output benefit and increases employability of the dairy and piggery enterprises. There is growing demand for pork meat, milk and milk products and great improved export potential for products of dairy and piggery sectors. Growth of established and expanding market for traditional dairy products, processed meat products and increasing demand for fluid milk as well as value added products indicates a positive

trend for the enterprises under study. By-product utilization for import substitution can also be encouraged to improved returns from production.

Human population in 2050 is estimated to be 9.15 billion, with a range of 7.96–10.46 billion (UNPD 2008). Most of the increase is projected to take place in developing countries. Rapid population growth would mean high increase of food requirement. Another important factor determining demand for food is urbanization. Urbanization has considerable impact on patterns of food consumption in general and on demand for livestock products in particular. Urbanization often stimulates improvements in infrastructure, including cold chains allowing perishable goods to be traded more widely. Income growth of population also plays a major part in increased demand for livestock products. Historically, production response has been characterized by systems as well as regional differences-the agricultural production sector is catering increasingly to globalized diets. Retailing through supermarkets is growing at 20 per cent per annum in countries such as China, India and Vietnam, and this will continue over the next few decades as urban consumers demand more processed foods, thus increasing the role of agri business . Meeting the substantial increase in demand for food will have profound implications for livestock production systems over the coming decades. A further important factor is that changes in per capita consumption in the developing world are likely to have a much greater global impact than changes in the developed world. This is because, first, the developing countries have a much greater proportion of the world's population (about 77 percent in the 1990s), and, second, they have much higher rates of population growth (1.9 percent per annum, versus 0.4 percent in developed countries). As incomes increase, demand for greater food variety grows. Demand for higher-value and quality foods such as meat, eggs and milk rises, compared with food of plant origin such as cereals. These changes in consumption, together with sizeable population growth, have led to large increases in the total

demand for animal products in many developing countries, and this trend will continue. Between 1997/99 and 2030, annual meat consumption in developing countries is projected to increase from 25.5 to 37 kg per person, compared with an increase from 88 to 100 kg in industrial countries. Consumption of milk and dairy products will rise from 45 kg/ person/p.a. to 66 kg in developing countries, and from 212 to 221 kg in industrial countries. The world's livestock production, food consumption of both dairy products and meat specifically pig meat for the past and future projections given by FAO is listed below:

Table 6.1 : World Livestock Production by Commodity: Past and Projected.

	Livestock production by commodity: past and projected				
	1967/69	1987/89	1997/99	2015	2030
Livestock Products	**Million Tonnes**				
Total meat	92	166	218	300	376
Pig Meat	34.1	66.3	88.5	110.2	124.5
Milk (whole milk equivalent)	387	528	562	715	874

Source: FAO, Economics and Social Welfare Department

Table 6.2: World Food Consumption of Meat and Pig Meat: Past and Projected.

Livestock Products	1964/66	1974/76	1984/86	1994/96	1997/99	2015	2030
	kg per capita, carcass weight equivalent						
Total meat	24.2	27.4	30.7	34.6	36.4	41.3	45.3
Pig meat	9.1	10.2	12.1	13.7	14.6	15.3	15.1

Source: FAO, Economics and Social Welfare Department

Table 6.3: World Milk and Dairy Products (whole milk equivalent) Aggregate Consumption and Production: Past and Projected.

Growth Rate % per annum						
Aggregate consumption (all uses, whole milk equivalent)						
000 tonnes						
1997/99	1969/99	1979/99	1989/99	1992/99	1997/99-2015	2015-2030
559399	1.3	0.9	0.5	1.1	1.4	1.3
Production (whole milk equivalent)						
000 tonnes						
1997/99	1969/99	1979/99	1989/99	1992/99	1997/99-2015	2015-2030
561729	1.3	0.9	0.5	1.1	1.4	1.3

Source: FAO, Economics and Social Welfare Department.

It should be noted that, the rapid growth in meat consumption of several countries was supported by even faster growth in trade. Countries with increasing consumption met their requirement by imports, which grew almost 6-fold over the period, while production remained essentially constant. The growth of world milk production and consumption has been less than that of meat. World per capita consumption is currently 83 kg, up from 77 kg 30 years ago. All of the increase in per capita consumption came from the developing countries (from 37 kg to 52 kg), with China playing a major role in the last few years. In the developing countries, where almost all world population increases take place, consumption of meat has been growing at 5-6 percent p.a. and that of milk and dairy products at 3.4-3.8 percent p.a. in the last few decades. World meat consumption averages upwards rather significantly, from 30.7 kg in the mid-1980s to 36.4 kg at present . The per capita consumption of milk and milk products is higher in developed countries, but the gap with many developing countries is narrowing. Demand for milk and milk products in developing countries is growing with rising incomes, population growth, urbanization and changes in diets. This trend is pronounced in East and Southeast Asia, particularly in highly populated countries such as China, Indonesia and Vietnam. The growing demand for milk and milk products offers a good opportunity for producers (and other actors in the dairy chain) in high-potential, peri-urban areas to enhance their livelihoods through increased production. By volume, liquid milk is the most consumed dairy product throughout the developing world. Traditionally, demand is for liquid milk in urban centres and fermented milk in rural areas, but processed products are becoming increasingly important in many countries.

Livestock sector plays an important role in socio economic development and the national economy of the country. The contribution to the national economy in terms of Gross Domestic Product is 4.1% at current

prices for livestock sector during 2012-13. The livestock sector has marginally declined during 2009-10 to 2010-11 and further increased from 28.56% in current and constant price during 2010-11 to 29.99% during 2012-13 respectively. The analysis shows nearly 51% of milk production is contributed by Buffalo followed by 24%, 21% and 4% for Cow Exotic/Crossbred, Cow Non-Descript and Goats respectively. The production of milk rose from 112.2 million tonnes in 2008-09 to 132.4 million tonnes in 2012-13. The analysis shows that nearly 45% of the production of meat is contributed by Poultry.

Pork production in India is limited, representing only 7% of the country's animal protein sources. The pig population of the country is 11.1 million as per the 2012-13 annual report of Animal Husbandry. Production is concentrated mainly in the northeastern corner of the country and consists primarily of backyard and informal sector producers. According to 18th Livestock Census of India (2007), there was a marginal decline in total swine population. The Indian market for processed pork products is small, and the majority of this market is supplied through imports. There is requirement to minimize imports to the detriment of domestic industry. Although there are some local companies which manufacture processed products such as sausages and bacon, quantities are limited and the industry is small. There is huge prospect for value added product diversification and by-product utilization which would lead to lower production cost. In view of the importance of pig farming in terms of its contribution to rural poor and possible potentials for pig rearing in our country, Government of India has initiated measures to promote the pig farming on scientific lines under its five year plans. In order to make available good foundation stock 115 pig breeding farms were established throughout the country. With continuous rise in population the food requirement, particularly protein sources are on an increasing trend.

Livestock rearing is an integral component of mountain farming systems. Here, the tribal people practice mixed crop-livestock farming systems for sustenance. Livestock depend, to a great extent, on fodder grown on the community land, forestland, and as well as on crop residue. Meanwhile, the animals provide milk, manure, and much needed draught power. Livestock are therefore, important to the sustainability of hills and mountain farming. About 80% of the population's livelihood is based on livestock rearing under subsistence cereal farming system. The mounting pressure of increasing human populations on the mid-slopes and valley regions provide a way for decreasing land resources with fragmentation of agricultural land over the centuries. Under such circumstances, sustainable livestock farming, which is inevitable, provides a base for livelihood of the populace. Here, the term sustainable livestock farming refers to rearing of a sizeable livestock, producing enough milk and milk based products and balancing draught power and fodder supply in fragile ecosystem, where, sustainability livelihood of the marginal farmers' economy is tremendously based upon mixed subsistence crops-livestock farming. According to 2013-14 state department data, Nagaland imports `148.94 crores worth of pork and milk (powder milk and baby food) worth `62.36 crores, therein lies the prospect of dairy and piggery ventures. Nagaland also imports cattle and buffaloes from Myanmar and supply pork from neighbouring states. The imports for consumption requirement of the state gives opportunity for opening up employment generation for skilled and unskilled rural youth in these sectors. It generates self-employment for another group of workers in infrastructural set ups of processing, packaging, marketing and distribution of the products. Yet another set of workers get opportunities in service delivery sector like medical experts, Artificial insemination and vaccination, promotion of products etc . The department is focusing on development of piggery and poultry for meat production and infusion of superior germplasm

of dairy cattle for milk production to narrow the gap between the demand and supply of animal husbandry products. Rural piggery and dairy are being taken up in the form of backyard farming in rural areas and initiatives to assist the farmers are in process. The state government has also initiated the process of setting up a veterinary college at Jalukie, 100km from Kohima, to promote veterinary practice and to enhance production of meat. Promotion of dairying and piggery as a viable enterprise in the remote rural areas of the state can boost rural income and employment to a great extent. This can go a long way in removing poverty, unemployment and violence emanating from the rural areas. The target population of dairy and piggery promotion schemes should be primarily the marginal and poor farmers who are generally more dependent and more intensively involved in the business. Major potential and immediate relevance of these sectors is the income generation at rural level, particularly the villages. Any person/farmer with basic education, hard working aptitude and will to learn can start these ventures. Dairy and Piggery enterprises promotion among marginal and landless farmers would not only augment their sources of income and employment but also provide them security against drought, disease and hunger.

As discussed in earlier chapters, Dairy and Piggery farming of Nagaland are mostly small in size and independently-owned operations. As such, regarding animal related decision first priority is given to cattle shed/management followed by sale of produce, purchase, and sale of animals, grazing of animals, breeding of animals, pre and post natal management of animals, consultation with veterinarians regarding sick animals, feeding of animals, sanitary management, purchase of fodder, fodder management, insurance of animals, repayment of loans and it has given the least priority to obtaining bank loans or credit, for purchase of animals on dairy for milk production. The Nagaland government has set the target of becoming the first state in the country to become self-sufficient in meat production by 2020. At

present, the state imports about `200 crores worth of meat annually but officials of the veterinary and animal husbandry department are hopeful that this would come down drastically as all efforts are being made to increase meat production. The Department is working on initiating programmes to start modern slaughtering houses and pig-breeding farms in the state through public private partnership (PPP). Encouraging the Micro Small and Medium Enterprises; (MSMEs) particularly Dairy and Piggery enterprises, will be a huge step forward as they can play a vital role in the economic structure of Nagaland. In regards to dairying in the state, introduction of Dairy Development Programmes, policy regulations and strict implementation through cooperative alliances is the need of the hour. Meat-consuming Nagaland boasts of a huge market for pork consumers. Unfortunately, the current supply of pork depends mostly on suppliers from outside the state. Artificial insemination is recognized as one of the most potent techniques to aiding pig production and can therefore, be encouraged as one of the ways the state can build and consolidate its pork market hence creating a self-reliant and self-sustaining supply system, instead of having to depend on suppliers from outside the state. The government should chart out and deliberate immediate steps to promote pig rearing by bringing in teams of experts to render sophisticated up to date training on different aspects of health care, feeding management of pigs, scientific breeding, hygienic management as well as the advantages of artificial insemination for faster propagation of superior germplasm. The entrepreneur should remember that time spent managing the business effectively is likely to yield a higher return than any other task on the farm. Assessing market risk and market prospects before starting an enterprise helps in making informed and calculated decisions. Farmers who are committed to staying in the industry should start investing in improved farm infrastructure as well as work towards rapidly improving their levels of efficiency and output in order to ensure their future prosperity, they

should make full utilization of the different livelihood schemes and projects being implemented by the concerned State department. Adopting new practices on scientific lines will further aid in the vision to work for success in pig breeding and dairy farming for fulfilling the need for a self-reliant and self-generating production for consumers in the state.

CHAPTER VII

SUMMARY OF FINDINGS, RECOMMENDATIONS AND SUGGESTIONS.

According to 68th NSSO survey report covering 1 lakh households (July 2011 to June 2012) , between 2009 to 2010 and 2011-12 the proportion of people working slipped slightly in India. In 2009-10, 36.5% of the population was gainfully employed for the better part of the year. By 2011-12 the proportion of such workers had dipped to 35.4%. Meanwhile, the unemployment rate went up from 2.5% to 2.7%. Kerala has the largest unemployment rate to about close to 10% among the larger states. Among the smaller states, Nagaland has a staggering jobless rate of 27% but this may be compromised data because surveys are difficult in strife torn region. Tripura, another NE region but relatively more peaceful too has a high unemployment rate of 15%. The economy of the people of Nagaland is fully dependent on Agriculture. The state has inadequate socio- economic development because of ignorance, relative isolation, the difficult terrain, inaccessibility to the rest of the world and continued violence situation. These factors handicap the State's endeavors towards industrial and entrepreneurial development, private sector partnership in spearheading development initiatives and all round regional planning. Remoteness and inaccessibility are also the predominant cause for regional disparities in the State. An Index for Social and Economic Infrastructure by the Eleventh Finance Commission, during 1999, ranked Nagaland, with an index of 76.14, as the seventh most remote State in the country. Climate of Nagaland is typical of a tropical country with heavy rain fall. Lack of adequate infrastructure is a major vulnerability, because most of the structures in Nagaland, both Government and Private have been constructed without proper planning and expert consultancy. This infrastructural inadequacy which includes roads and industries creates impediments on the development of the state. The available data from N.S.S.O for educated unemployment rate (usual status adjusted) for 15 years and above in Nagaland has increased more than two folds from merely 2.6% in 1993-94 to 6.2% in 2004-05, which also indicate a trend of growing

educated persons in the rural areas of the state. Out of Nagaland's total population of 19,78,502 the total workers/working people amounts to 9,74,122 and non-workers or dependents numbers to 10,04,380. When divided into main workers and marginal workers, it is found that only 7,41,179 of total workers can be listed as main workers. Out of these 4,52,475 are directly or indirectly engaged in Agri and Allied activities and list their employment/work as cultivators, agricultural labourers and workers in household industries. The remaining 2,88,704 main workers are involved in other industries for work. Therefore, Agri and Allied industries is a high contributor to employment in the state and being an inherently traditional followed practice has the potential of absorbing a large number of unemployed population. With majority of the state's population not involved in any work, they are dependent on the working population and so stress on state's economy is very high.

The government sector of jobs and administrative services have far reached the saturation point in Nagaland. Therefore, alternate avenues need to be looked at, to solve the poverty and unemployment problem. . Since the main driver of economic growth in the state has been the services sector and the public administration sub-sector to generate employment in the state could be quite limited. There are hardly any major industries in the state out of which more than half of them are not functioning properly. Unlike other states in the region the near absence of a robust industry sector is hampering the employment potential of economic growth unless the sector undergoes a major revamp. Economic progress pushes our state in to a more service sector oriented economy. However, the current composition of the growth process does not ensure that enough jobs are being created. There is immediate need of a shift in focus from the current drivers of economic growth in the economy to different sectors that has the potential of generating more employment in our state. Our state has a rich and varied climate with vast

untapped potential in the agricultural sector. The Agri -Allied sector employment figure can increase if we focus on intensifying efforts in growth potential sectors like dairy and piggery and adding value to their produce in the state. Reducing risks and mitigating their effect on poor livestock-dependent people are prerequisites for a sustainable reduction in poverty. Small-scale production is associated with both market and production risks. Market risks include price fluctuations of both inputs and products and are often associated with a weak negotiating position. While subsistence farming often has sound risk-coping mechanisms, many small-scale producers lack the assets or strategies to sustain full exposure to commercialization and market risks. If livestock sector are to continue contributing to improving livelihoods, creating jobs and meeting market demands, the farmers would have to participate fully in the market and create competitiveness leading to growth. However, for that to happen, safety nets are needed for farmers to cope with the economic shocks invariably present in free markets. Public and private services at present almost invariably lack the capacity to plan for such risks, or to respond in a timely manner. Building up such response capacity of communities and institutions is important. Assessment of all factors involved and analyzing severity of prevalent constraints is necessary for removal of infrastructural and other bottlenecks, also to formulate problem solving steps, and ready preparedness strategies that would need to be an integral part of public policy.

The State in particular and country as whole is experiencing price rise in varying degree during the last few years**.** Rise in prices in other States directly impact relative price movement in the State effecting severely the common mass, as the State is consuming a huge quantity of essential commodities imported from outside. During the year period 2013-14, general price index level rose between 1068.70 in January to 1118.30 in December yielding a point of 49.60. This has further resulted in decline in purchasing

power of the people to a large extent. In regards to essential commodities milk and pig meat: In 2013-14, there was a shortfall of 48.62% and 49.48% against the total requirement of meat and milk in State's internal production. Considering the huge demand of dairy and piggery products in the state, immense opportunities prevail in improvement of productivity. Due to rapid changes in lifestyle and food habits, consumption of milk and milk products are becoming increasingly popular. Pig plays an important role in increasing the meat production which is an important economic characteristic essentially required to overcome the protein deficiency problem of the people to a great extent. Pork surpasses the meat of other animals with respect to various nutrients. Dairy and piggery sector has extensive growth potential and in Nagaland, cooperatives are the most suitable attributes for promoting the rural economies, providing an alternate regular source of income for the farmers and uplifting the living standard of the poor. . The farmer cooperative system has proved to be an effective vehicle for livestock development in general and dairy and piggery development in particular in rural areas. Initiating and introduction of Development Programmes, policy regulations and strict implementation through cooperative alliances, taking into account the recommendations listed will lead to better utilization of Dairy and Piggery resources of the State. Therefore, the government should prioritize Cooperative structure within the Dairy sector as it has the potential of bringing about maximum growth and profit generation thereby leading to decentralization of production, employment generation and economic development of the sectors under study in the state.

The paucity of reliable data on the material resources of the state coupled with lack of records with the state enterprises makes the task of delineating the sectors under study a difficult one. However, the ever ready to help attitude of the department staffs and the entrepreneurs to give out information has helped and made the task less difficult. Looking to the social

and cultural attributes of the population it will take a while before the local populace will have ready trained personnel to man the jobs generated by these sectors. In this context, the forward looking policy of the state government in initiating relevant training for the tradition bound farmers/population for improving knowledge base skills is an uphill task. It is hoped that the state government can overcome the problem soon. The study is expected to assist the development of dairy and Piggery sector –the farmers as well as the government and other concerned parties to gain insight into the structure and workings of the dairy and piggery sector. It is expected to be useful to understand and address the different aspects and factors involved in the enterprises under study and help entrepreneurs to decide the economic viability of these enterprises. Also, assist the government in formulations of policies and schemes, choosing to adopt the right methods and in deciding the best way to go about implementing them for optimum growth/ benefit. The findings may also be considered as important additions to enrich the existing knowledge and literature in the arena of dairy and piggery sector particularly of the state of Nagaland. For the thesis, primary data collection was collected through comprehensive personal interviews and extensive field survey supplemented through questionnaire prepared and answers collected from the respondents under sample survey. Secondary data was collected from library work, visiting farms and offices and from collected information by consulting persons of related matter.

MAJOR FINDINGS OF THE STUDY:

The overall findings about the enterprises under study after analyzing and assessment of all collated data is listed below:

- There has been overall decline in the population of cattle, buffaloes and pigs in the state with the percentage decline in the 2007-12 year period

as 51.6%, 7.3% and 29.6% for cattle, buffaloes and pigs respectively. There is general skeptical approach and lack of appreciation by farmers who are traditionally crop-oriented to pursue animal farming on a large scale and holding on to the traditional concept of animal farming being a secondary added occupation. The livestock decline is also due to reducing rural population/human resource to assist in the growth and management of livestock sector, on account of migration from villages to towns and cities in search of better income/livelihood and the implementation of total sanitation campaign (GOI 1999) in Nagaland, which included prohibition of free-range livestock rearing in almost all the villages and made animal housing compulsory.

- Data ascertained that the growth rate of milk production is 6.67% from 2007-08 to 2008-09 which is commendable but the growth rate of milk from 2010-11 to 2011-12 is only 0.39% which is discouraging. Growth rate of meat is 14.58% from 2007-08 to 2008-09 which also falls to only 3.70% from 2010-11 to 2011-12. The reason for this sluggish growth in milk and meat production is due to improper implementation of schemes by the department and also due to the casual nature of our people in undertaking these activities.

- There is a shortfall of 48.62% and 49.48% against the total requirement of meat and milk in State's internal production. The shortfalls are met with imports from other states of India and Myanmar. Many imports are not documented for Tax evasions. This contributes to the slow economic growth of the state and results in the local farmers engaged in animal husbandry to lose out to the import market. The data however emphasizes the huge prospect and scope of the dairy and Piggery enterprises in the state due to high demand. Besides it opens up avenues

or local farmers to capture the revenue generation source away from the importers.

- Development of dairy and piggery enterprises is a rising phenomenon amongst the Nagas although it has not been highly commercialized yet and needs much emphasis on measures of improvement in its management, organizational structures, processing and marketing to make it economically viable for the state. In spite of the rising demand, pig population and milk production is yet to reach the optimum needs of the state.

- It was found that majority of the animals for dairy and piggery enterprises are purchased from the agents who bring the animals from neighbouring states like Assam and Manipur, at a much higher price. The primary supply of animals is therefore from out of state and this often results in higher cost of production and reduces annual income.

- Increasing purchasing power, changing socio-economic status and life styles have contributed for the enhanced consumption of packaged, processed and convenience dairy and meat products. Value added by-products of the dairy and piggery sectors have now opened up new emerging market opportunities.

- The livestock produce is usually consumed locally and the sale price of products varies depending on remoteness of the locality. At present, milk and pork meat are among the essential commodities in the state. There is very poor market and transport linkage and rural farmers practice direct selling of both milk and pork meat or sell surplus produce at low price to middlemen thus reducing their profit.

- There is no organized market structure and lack of infrastructural support for dairy and piggery sectors. Majority of the farmers still use traditional unconventional localized means for promotion and distribution of their products.

- Findings of the study suggest that, the main factors influencing the entrepreneurs/ farmers to venture into dairy and piggery farming is the urge for self employment and the unavailability of a stable source of income which makes up about 45%, followed by inheritance- farm enterprise at 22%. On the positive side, 22% of the remaining influencing factors for farmers to start ventures in the sectors under study is found to be as a result of the pull factor of the dairy/piggery sector which includes Government/NGO's assistance, expansion of knowledge base of the progressive farmers, increasing awareness of considerable profit and returns generation and market viability of the dairy and piggery enterprises.

- The trend of livestock population in Nagaland is discouraging for all types of animals i.e. cattle, buffaloes and pigs as there has been a steep decreasing trend of growth. The percentage change of population growth for 2012 as compared to 2007 census is at a negative. The state of Meghalaya paints a better picture in relation to livestock growth from 2007 to 2012 and the percentage change for cattle and pigs though less, shows as being positive. However, the percentage of buffaloes for Meghalaya also stands at negative.

- It is ascertained that majority of the livestock population of both Nagaland and Meghalaya are found in rural areas. This indicates that commercialization of Livestock is yet to gain popularity and most of

the livestock farmers are rural people. The current capacity of veterinary hospitals, dispensaries, aid centres and trained veterinary medical experts are not enough for the state's requirement and still lacks in modern advancement for both Nagaland and Meghalaya.

- It is found that the production of milk for Nagaland fluctuates drastically in different year periods whereas Meghalaya shows a trend of steady growth rate in milk production for the entire study periods. For pork production too, Nagaland has a fluctuating trend of alternating increase and decrease every other year. However; for Meghalaya, the average annual growth, though slow is steady and shows promising growth trend.

- The management and implementation of various schemes of the Government (both state and central) are not very effective in the state of Nagaland. Also, systematic and correct data/record keeping is found to be lacking.

- Dairy and Piggery Enterprises in the rural economy is unquestionably interrelated to growth and development. Dairy and Piggery Enterprises has major impacts on the rural economy of Nagaland specifically on Socio-Economic Development, Human Resource Development, Employment Generation, Livelihood Improvement, Women Empowerment and Upliftment, Improved Food Intake and Nutritional Security and in controlling Urban Migration.

- Major components for management in the dairy and piggery enterprises in Nagaland are Livestock Breed, Housing, Feeding, Health care and Sanitation. All small, medium and large enterprises spend the highest

amount on cost for feed followed by labour, miscellaneous, repairs of sheds and the lowest amount spent is on cost for medicine.

- Major problems/Constraints to development of Dairy and Piggery enterprises were found to be Economical, Financing/Credit, Feed, breed, Marketing, Medical and Animal Health, Professionals/Skilled human resource, No Organizations/Association Support and Record / data keeping, Industrial/Infrastructure Constraint, Topographical, Nutrition, Land Availability, Government Policies & Assistance, Administration & Management Problems, Knowledge Base and Social Constraints.

- It is found that in Nagaland, Small and medium enterprises outnumber large enterprises by a wide margin. Survey puts 85% of the enterprises under study as small enterprise, 13% as medium and only 2% as large enterprises.

- The calculated weighted average for overall cost in production of 1litre milk in Nagaland is `18.22. The cost in production for 1 litre of milk is highest in Kohima at `21.60 followed by Dimapur at `19.75 and lowest for Wokha District at `16.75. The calculated weighted average for overall cost in production of 1kg pork meat in Nagaland is `87.69. The cost in production for 1kg of pork meat is highest in Peren at `106.14 followed by Kohima at `101.65 and lowest for Mon District at `65.88.

- Calculation of returns of Dairy and Piggery enterprises in relation to the monthly cost and investment indicates that there is considerable returns in relation to the cost of the enterprise which shows that the farmers

gets a good profit margin. This trend is found in all small, medium and large sized enterprises of Nagaland.

- The return on Investment for Dairy and Piggery enterprises is found to be 62.45% to 64.00% and 40.45% to 72.82% respectively. The Return on Sales for Dairy and Piggery enterprises is found to be 56.36% to 58.64% and 42.82% to 57.91% respectively. These enterprises have ample scope, huge prospects and are economically viable for the state of Nagaland.

Based on the study and assessment of all primary and secondary data of the subject matter, the following hypothesis have been tested. The major findings basing on the hypothesis are discussed below.

TESTING OF HYPOTHESIS:

The entire research study is followed by three pre-determined hypothesis:

1. Both Dairy & Piggery Enterprises are economically viable for the state which can offer gainful employment.

2. Performance of Dairy & Piggery Enterprises of the State are not encouraging.

3. Efficient marketing channel of distribution of Dairy and Piggery Enterprises will be helpful to generate income of the rural people in the State.

Testing of Hypothesis I

As per sample survey report of 2007 – 2008, the state produced only 60.9% of the net domestic product. The balance 39.10%, is imported from outside the state. Import of meat and meat products not only increases the cost of food but also results in outflow of resources. In the absence of any recognized industry in the State, Animal Husbandry and Dairy alone can absorb a large fraction of unemployed youth in the State. The north eastern state is protein deficient and the production is not sufficient to supply the need of the region. Huge amount of cash is drained out annually for purchase of meat, milk, egg, fish and their product from other states. This is confirmed by the livestock census of the state, existing scenario of milk and meat requirement consumption status given in Chapter 2, the data from Department of Veterinary and Animal Husbandry, Government of Nagaland which indicates that there is a shortfall of 48.62% and 49.48% against the total requirement of meat and milk in State internal production (2013-14). These shortfalls are met with imports from other states of India and Myanmar, moreover many imports are not documented for tax evasions. Here lay the enormous potentialities to exploit the ever growing demands in livestock and livestock products. There cannot be any social and economic changes and development without a good network of transport and communication. However, in Nagaland; the transport and communication facilities are far below the desired level and thereby, retard the growth and economic development of the state. State of Nagaland is still backward as compared to the other parts of the country and could not develop much industrially despite having vast natural resources. It is economically non-viable and depends almost entirely on central assistance for its economic development. In this connection, benefits of low investment enterprises with basic infrastructure requirement such as dairy and piggery sectors can be explored. Livestock cooperatives will, undoubtedly play a significant role in bringing about

integration and development in agriculture of NE region. Thus, dairy cooperatives and piggery cooperatives can be profitably taken up considering the scope and market demands as new commercial economic activities. Livestock's share in the value of output of agriculture and allied activities is about 30% in north eastern. Acceleration in the growth of livestock in NER though slow offers significant opportunities for household income augmentation and employment generation. Dairy and Piggery enterprises fits with the available farm level infrastructure and capacity of the small farmer of Nagaland and would have a huge impact on the economy of the state if practiced- following the current scientific and technological advancement in the sector diligently. Therefore, the proposed hypothesis can be proved to be correct that both Dairy & Piggery Enterprises are economically viable for the state of Nagaland and can offer gainful employment to the state's majority rural populace.

Testing of Hypothesis II

Performance refers to the successes and failures of the undertaking in achieving the targets and objectives. Nagaland has not been able to build up the economy through the country's planned process of development, as in other states of India. With regards to Dairy and Piggery sector too, the Government provides schemes to establish these farms, but due to rampant misappropriation of funds and mismanagement , only a meagre portion is utilized for the same or most of the funds go to VIP supported candidates and not the actual genuine beneficiaries. Also due to no follow up procedure and restriction, the beneficiaries do not utilize the assistance provided for the intended purpose. The Nagaland State Dairy Cooperative Federation Limited was formed with three District Milk Unions namely Kohima, Dimapur and Mokokchung respectively in 2002 and is a registered entity under small scale Industries (SSI) Regulation Act. For all its operational areas (i.e Kohima, Wokha, Mokokchung & Pfutsero) it uses the brand name KOMUL(Kohima

Milk Co-operative Union) now under the brand name MILKCON(Milk Co-operatives of Nagaland), a separate Union was created under Dimapur district known as DIMUL (Dimapur Milk Union Ltd.). Recently, the dairy products market has seen a new entry in the private sector based in Dimapur under the name "Greenfield". MILKCON, DIMUL and Greenfield are the only three notable dairy enterprises in Nagaland where the market for dairy products is huge and expanding. Works are in active progress by the government to establish and commission more milk chilling plants & Bulk Cooling Units but most of these works have been delayed. The UHT (Ultra High Temperature) plant, the first of its kind in the Northeast region supposed to produce long shelf life toned milk commissioned on 3rd June'2013 was discontinued within a short period of time citing technical problems. There are also a number of defunct units and feed plants due to technical problems, resource unavailability and lack of efficient management. The piggery sector in Nagaland is also unorganized, the local butchers are registered as traders with the Municipal and Town Councils thus they pay their registration fee and annual fees to them, pig rearing is mostly a domestic enterprise and need no registration as such. There is no organizational set up and no known boards/Union for the pig rearing/butchers of the state except the recent formation of Nagaland Pig Farmers association at Dimapur on Oct 6'2013 which at present has a membership of only 40 registered members. Therefore, there is lack of cooperative alliances, awareness or full utilization of different available schemes or coordination among the pig farmers. Meat consuming state of Nagaland boasts of a huge market for pork consumers. Unfortunately, the current supply of pork depends mostly on suppliers from outside the state. Local farmers rarely have any awareness on scientific breeding methods and feed supplements or for that matter about any government programs, schemes or available assistance. Most of the farms in the dairy and piggery sector are not Government sponsored but they are individual's effort. Therefore, the

capital investment is low and they are not commercially viable thus creating high demand and shortfall. Interviews with officials of the Department of Veterinary and Animal Husbandry, Dairy and Piggery division, indicates that though the government is trying to uplift the dairy and piggery enterprises, there is a problem of funds being channelized properly, issues in proper implementation of programmes/schemes and of mismanagement. One of the major issues faced by farmers trying to set up dairy & piggery units is huge hurdles in obtaining government aid/schemes. The Quinquennial livestock census of Nagaland indicates that there was general increase in growth rate overall livestock till 2007 after which there seems to be a trend of sharp declining growth rate. This overall decline in livestock population maybe because of skeptical approach and lack of appreciation by farmers who are traditionally crop oriented to pursue animal farming on a large scale and holding on to the traditional concept of animal farming being a secondary added occupation. The average growth rate of the estimated milk production of the state from 2005-06 to 2013-14 is 1.87% and that of meat for the period 2007-08 to 20012-13 is 5.99%. This sluggish growth in milk and meat production can be attributed to improper implementation of schemes by the department and also due to the casual nature of our people in undertaking these activities. Though there is huge scope, there is lack of attraction features of dairy and piggery sector for entrepreneurs, the constraints overrides the positive points for the Naga farmers. Study suggested that current existing farms are making marginal profit but new entrants to the sector under study, are few and far between and development growth is very slow. Therefore, the hypothesis that performance of Dairy and Piggery Enterprises of the State are not encouraging can be proved to be correct.

Testing of Hypothesis III

Majority of the animal husbandry farmers belong to low income group, has medium land holding capacity, low education and residing in rural areas with lack of proper transport, market and communication facilities. Major constraints faced by these farmers include high cost of concentrate feeds, non-availability of proper veterinary health care, high cost of initial input and lack of quality piglet/calves, frequent outbreak of diseases, lack of availability of good breeding boar/sows etc., lack of market linkages, proper storage units etc. Scientific interventions in utilization of non-conventional feed resources, capacity building in health care services, adoption of scientific breeding, awareness and use of artificial insemination and developing suitable entrepreneurs for medium to large scale production and proper use of pig by-products could transform the traditional subsistence of farming to a profitable enterprise. The survey study has shown that animal husbandry in Nagaland specifically dairy and piggery sector still solely depends on small scale production system and where the market promotional activity is mostly via word of mouth/ friends (62.6%), advertising through media(2.5 %), door to door publicity(6.7 %), others(28 %) and method of distribution of products is through direct selling (75.4%), through wholesaler (11.7%), through retailer(6.4%), others(6.5%). Considering the huge demand of dairy and piggery products in the state, immense opportunities prevail in improvement of productivity. Suitable market linkages for procurement of inputs like quality germplasm, feeds, feed supplement and disposal of farm produce ie; milk and dairy products, piglets, pork and by-products etc; is necessary for continuous flow of resources and output in dairy and piggery farming. As there is no big commercial enterprises engaged in pig farming, organizing the small holder pig farmers through co-operative approaches could be an alternative. Furthermore, number of dairy co-operative is also very less. A small step has been taken through the establishment of Nagaland pig farmers association, in

formation of state level organizations to look after the market linkages. Network of such organizations and co-operative set up can boost the income level of the marginal farmers of the state. Most of the dairy and piggery farmers of rural Nagaland use the informal method for marketing and selling their products. The inherent problem with this method is that the farmers do not get proper price for their products and are cheated of their profit. The quality of farm produce sold informally is also of poor quality because these traders do not follow any safety standards, guidelines or rules. Thus, the produce maybe unhygienic and lack in nutritional value. Focus should be made on improving our rural roads to make them motor able and fit for mechanized transport for easy access to and fro between markets and source of produce to bring about competitive pricing and increase earning capacity. Efficient marketing channel of distribution of dairy and piggery enterprises will necessitate cost-effective management and integration of the suppliers and purchasers. This would create value added markets for dairy and piggery enterprises, reduce profit trapping participants in the market channel, remove sales and merchandising problems and issues and help in generating income of the rural people in the state. The Government should provide avenues for easy transportation of perishable food products for dairy and piggery enterprises to make these sectors economically viable , proper channel of procurement of produce and marketing should be initiated and implemented to assure that maximum benefits of consumerism reaches grass root level of producers.

SUGGESTIONS AND RECOMMENDATIONS:

The following recommendations can be made for better performance of dairy and Piggery Enterprises in Nagaland:

- Commercialization to be encouraged as Larger farms are able to bargain more competitively, purchase more competitively, profit from economic highs and weather lows more readily through monetary inertia than smaller farms. Commercialization of Dairy and Piggery Development Programmes will lead to better productivity and generate employment opportunities at a large scale.

- The establishment of Government and Institutional farms should be supplemented with an active programme to stimulate the small farmers to accept Dairy and Piggery Enterprises as part of rural activities. Unless efforts are concentrated to appeal to the human element involved in the process of change, handling of Dairy and Piggery production in large modernized units cannot succeed. Efforts should be made to create a conducive environment, through public sector investment where necessary, to allow producers to increase production through improved efficiency and productivity.

- Providing government support services and infrastructure to producers, adequate raw material and resource mobilization. For proper storage and transportation, cold chain needs to be strengthened. Conducting periodic survey and audits to ensure that support services and government assistance are being availed by the deserving target group beneficiaries, to check black marketing and corruption. Provisions of capital and incentive should be made available to the farmers in term of

loans and subsidies, because it has been found that these issues are among the major setbacks in developing an economic oriented Dairy and Piggery Enterprises.

- Survey indicated that out of all respondents under study, 61.5% had availed loans for start-up. Almost all of them take loans from private individuals/societies/groups with higher interests usually because of problems of getting bank loans. Besides car loans and housing loans to Central and State Govt. employees, Banks in Nagaland have no interest in dealing with the local people, especially the farmers for loans. Banks should adopt farmer friendly attitude and faithful implement GOI schemes. The process for getting the loans should be simplified for the needy farmers to avail loan easily. Farming insurance should also be implemented. This will encourage the unemployed youths to come forward to start dairy and piggery venture as their means of livelihood.

- Investment in extensive awareness programs using various media and NGO's to promote dairy/milk culture and including upcoming youth entrepreneurs as target group. The department should aim at undertaking frequent training programmes for up to date knowledge on lucrative dairy farming and professional/technical skill upgradation for all workforce. Initiating social programme undertakings to encourage productive local and self employment, removing dependency attitude on imported labour to facilitate economic growth within the state.

- State should facilitate building of institutional and infrastructural capacities to allow small-scale rural producers to compete and integrate successfully within the developing livestock industry. Areas of the

dairy industry can be strengthened by the induction of state-of-the-art technologies from overseas to breech the technological gap. Latest packaging technology can help retain nutritive value of packaged products and extend their shelf-life. Research and development activities should be prioritized for optimal genetic improvement in dairy animals using biotechnology and genetic engineering.

- Increasing wage and benefits for dairy/piggery workforce is requisite to increase dedicated work culture, enhance work satisfaction and uplift the living standard of the workers so as to do away with the problem of defunct dairy plants due to want of dairy personnel. Updating outdated laws and reduction of taxes on dairy products. Surplus generation should be encouraged for export to earn more revenue for the state as a whole.

- Strict implementation of various schemes and proper utilization of grant in aids/resources for increasing the insignificant position of state's milk contribution of only 1% to the national pool. Adopting standard management practices to restrict arbitrary decision-making, better operational efficiencies and the adoption of best manufacturing practices needed to improve yields, reduce waste, minimize fat/protein losses during processing, control production costs and make the product more export competitive. A systematic and correct record keeping should be strictly maintained especially for data reference in making informed decisions.

- Pig production is a vital activity in rural areas and has helped to provide employment and income generation for farmers, rural poor and weaker

sections. The abundantly available and comparatively low priced pork has a vast potential for production of several value added convenience meat products. The developed processing techniques for several products need to be evaluated at pilot scale and by large scale consumer acceptance trails for their techno-economic feasibility. Production of meat products with adequate process and quality control may find their entry into global markets and fetch higher returns.

- The most crucial factor in livestock breeding and production is the quality and quantity of feed fed to the animals. The production of fodder is dwindling fast, being a neglected subject under the livestock programmes. With urbanization and deforestation, grazing lands and fodder production area is facing rapid reduction. Therefore, there is need to insert strenuous efforts for enhancement of feed and fodder production in the state so that shortage, particularly during the lean season of the year could be mitigated. Establishments of feed manufacturing plants and other infrastructure have become necessary to cater to demands of both state and private farmers.

- Training of farmers on scientific cattle and pig rearing and market-oriented production systems. The need to establish and strengthen the marketing mechanism at local level to the marketing channels and the production programme integrated with slaughter houses to ensure better sustainability.

- Personnel working in dairy plants and butchers should also be trained about hygienic slaughters, processing and packaging of products. Working conditions of farms, existing dairy plants, butcher shops,

processing plants etc. should be improved and licensing according to required hygiene and physical facilities requirement should become mandatory.

- In proportion with the quality of milk and meat available, the authority should see that the market rate of locally produced good quality meat be increased and low quality imported meat be decreased. The state quality inspection bodies should be more sincere and diligent in carrying out their duties and make sure that high quality standard of milk or meat products reaches the consumers. Moreover, certain policies of taxation/control should be imposed on imported meat to increase state's revenue, encourage entrepreneur ventures in the dairy and piggery sector, improve localized market products and limit the import into the state.

- Farmer Skill Improvement: Development programmes in rural areas must necessarily start at the grass root level taking the rural poor into confidence and cater to their felt needs, making use of the resources available in the village itself. Developing skills in simple management and administration will go a long way in increasing productivity. Improving skills of these farmers has a great impact on production efficiency and to increase their market share and thus income.

- Rural Producers lacked knowledge about feeding, health care and breeding practices that could improve their pig production. What is required are need-based, client-oriented programmes using participatory methods and action research to improve the capacity of pig producers to make more effective use of available feed resources, to maintain their pigs in good health and to breed productive crosses. The

programmes should be designed with the aim of improving production through incremental steps achievable within the limits of current household resources, especially feed and labour. Particular attention should be given to learning from the current best practices of successful low-external input producers and overcoming feed constraints. It is also important to impart latest knowledge and skill enhancement periodically to the farmers to encourage use of modern methods of farming and advanced technological implements for higher productivity.

- Setting up veterinary infrastructures and upgrading of local stock mainly through crossbreeding with high yield breeds and artificial insemination and encouraging more health intensive and hygienic practices of cattle and pig breeding. The important factor to be taken into account for maximum milk yield of dairy cattle and meat of pigs is the availability of suitable breed. With the growing demands, more efforts should be given by the Department of Veterinary and Animal Husbandry to make the breeds available to the farmers at reasonable price. Encouraging the trend of climate mitigation, effective reduction of environmental, animal and human health threats.

- Arrangement should be made for follow up action. It is strongly felt that there should be a follow up system and certain agreement should be made with the beneficiaries to guarantee that the assistance extended, is utilized for the purpose intended and not for immediate cash instead.

- Additional support and improvement necessitated on advertisements and sales promotion to combat competition from multinational brands and imported dairy products. Promotion of local brands within and outside the state to promote market presence and open up export avenues. The removal of policy distortions that artificially increase economies of scale and disadvantage small-scale producers.

- Dairy and Piggery Enterprises, if practiced scientifically and commercially will lead to regular flow of income from milk, meat and leather production throughout the year. The income generation from this sector is higher than crop production. Technologies for low cost production need to be developed and implemented in the dairy and piggery sector to produce milk/pork meat economically. Government breeding farms needs to b strengthened as resource centers for supplying high yield breeding animals for the breeder farms.

- Formation of associations: Associations of farmers, producers and commercial enterprises should be formed to develop healthy competition, to provide a forum for exchange of experiences, information and technologies. At present, there is no strict quality standard. They should also develop a code of ethics on quality control and maintain consumer trusts. Cooperation in the State would play a pivotal role in the promotion of cooperative sector through genuine cooperative entrepreneurship evolving into a mechanism of resource mobilization, regular income generation, gainful employment and wealth creation.

- Farmers should be encouraged to adapt to changes be it social/climatic/legal/economical and reframe their methods of rearing animals accordingly. Instead of establishing villages with large population clustered together in a compact area, following the 'Sumi' community example, of setting up number of smaller settlements/villages at certain distances from each other thus solving space constraints, this method tends to be very conducive to land intensive industry growth like dairy and piggery enterprises

- To generate employment opportunities and to improve the economy of Phek District, the Chakhesang Public Organization banned the import of meat from the year 2000. This lead to growth of large numbers of small pig farms in Phek District. This Policy if undertaken by the state government for the whole of Nagaland will create huge employment opportunities. Encouraging community based programmes would undoubtedly invoke spirit of inclusiveness and result in more enthusiastic response from the farmers of the particular community.

CONCLUSION:

With the establishment of the Nagaland Directorate of Veterinary &Animal Husbandry in 1965, the state has starte d commendable schemes and projects to improve the animal husbandry sector especially dairy and piggery enterprises. Affiliated bodies like NSDCF, Nagaland Livestock Development Board, Nagaland Veterinary Council and Nagaland State Piggery Cooperatives Federation (NSPCF) Ltd. Kohima have been set up with various sub schemes and programmes for overall livestock/animal husbandry development. Since inception of NSDCF in 2002, dairy development activities are growing in strength. There has been organisation at

village level of Dairy Co-Operative Societies (DCS) or Women DCS whichever is viable and infrastructural establishment of some Milk Processing / Chilling plants in to facilitate milk procurement and Marketing Avenue for dairy farmers. However, the current infrastructures are not sufficient and the growth is seen mostly in urban and peri-urban areas among progressive farmers and is yet to make an impact on the same scale among the actual intended rural populace. The Indian Council of Agricultural Research (ICAR) is promoting breeding superior pig germplasm through artificial insemination with aims to employ artificial insemination to, hopefully, transform Nagaland state from a pig-importer to self sustainable in pork production by 2020. Regulation of veterinary services was started with the establishment of Nagaland Veterinary Council in 1998. NABARD has started various schemes and sensitization programmes for the farmers. Albeit all these positive developments to promote dairy development and related activities, effective execution, completion and implementation of the schemes are rarely seen. The diverse administrative and managemental issues in the state prevent the benefits from reaching the actual beneficiaries. Government should take up proper and sufficient steps to solve these constraints and to motivate all sections of the people to take up dairy and piggery farming. Intensive development with strict direction & Administration of all branches of the department should be followed.

Taking into consideration all data collected and analyzed and the comprehensive assessment done thereof; it is found that both dairy and piggery enterprises are economically viable and a reliable and dependable source of income assisting development and growth of the state. For policy formulation and organizing extension activities data on cost and return along with employment potential is found to be requisite. Therefore, to supplement and comprehend that idea, a cost and income analysis has also been made using both primary and secondary data. Traditional practices of farming are

no longer applicable for growth under present circumstances with rapid growth of population and reduced per capita land holdings. Inspite of the constraints, scientific farming and commercialization of the farm produce is consequently required for production enhancement to aid in economic development. Sample survey has indicated that dairy and piggery are the most important source of subsidiary income in the state's agricultural sector and the rate of profit margin is high compared to other business ventures. It is to be noted that there is lack of functional literacy among the entrepreneurs/farmers. Only 20% of the surveyed respondents have studied to graduation level, majority of the farmers around 50% are illiterate or have studied only upto class-8. Better educated people have less knowledge constraints and are more open/willing to learning and adopting scientifically advanced techniques of farming so measures should be undertaken to encourage and promote subject specific higher education. Development interventions in the livestock sector generally have not been very successful. Many livestock development projects have not succeeded because of inappropriate technologies and failure to deliver services to poor farmers. Clearly, an enabling institutional and political environment is indispensable if interventions and strategies are to focus on the poor in a sustainable way. There is also lack of enterprise literature and publications. NGO's and government departments should come forward to conduct more training and awareness camps to widen the knowledge base of the dairy and piggery entrepreneurs to overcome overall social, psychological and knowledge constraints of the sector. This will in turn have the State reap the full benefits of the potential in Dairy and Piggery enterprises.

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QUESTIONNAIRE

(Fill in the blanks/ tick whichever is applicable)

1. **DAIRY FARMERS** ☐ **PIGGERY FARMERS** ☐

2. General information of the respondent:
   a. Name : ……
   b. Gender: Male ☐ Female ☐
   c. Age: ☐
   d. District: ……..
   e. Qualification :
      i.None ☐ ii. Upto class 8 ☐
      iii. Upto class 12 ☐ iv. Graduate and above ☐

3. Occupation:
   i. Agriculturist ☐ ii. Business ☐
   iii.Government Employee ☐ iv. Dairy farmer ☐
   v.Piggery farmer ☐ vi. Others ☐

4. Is Dairy/Piggery farming your?
   i. Primary occupation ☐ ii. Secondary occupation ☐

5. What is the type of ownership of your enterprise?
   i.Sole proprietorship ☐ ii. Partnership ☐
   iii.Co-operative Society/SHG/NGO ☐ iv. Others ☐

6. Where is your Farm/Enterprise situated?
   i.Family owned land/Ancestral land ☐ ii. Leased land/Rent ☐
   iii.Joint ownership/Society/Organisation ☐ iv. Others ☐

7. What influenced you to start your venture on dairy/piggery farming?
   i.Family inheritance ☐ ii.Urge for self employment ☐
   iii.Non-availability of govt. job/other stable job ☐
   iv.Availability of subsidy/assistance from govt. ☐
   v.High Benefits/Profit in the animal husbandry sector ☐
   vi. Personal reason /Other ☐

8. Is there a veterinary aid center within walking distance of your farm (1 to 2kms)?
   i. YES ☐ ii. NO ☐

9. Do the Govt. (Department of Veterinary and Animal Husbandry) conduct awareness programme for dairy/ piggery farming in your district?
   i. YES ☐ ii. NO ☐

10. Did you avail any benefits/ subsidies from the Government ?
   i.YES ☐ ii. NO ☐

11. Did you take any loan from Bank/Societies/Individuals?
   i. YES ☐ ii. NO ☐
   If so, what is the rate of interest they charge for the loan?
   i.Bank ☐ % ii. Societies ☐ % iii. Individuals ☐

12. Are you satisfied with the performance/quality of service provided by the banks?
   i. Yes ☐ ii. No ☐ iii. Partially ☐

13. Where do you get your sows/boars/cows from?
   i. Own district ☐ ii. Other district ☐
   iii.Other state ☐ iv. Others ☐

14. Who are the main suppliers of sows/boars/cows?
   i. Govt Agencies ☐ ii. Traders ☐
   iii. Individual farmers ☐ iv. Others ☐

15. Are there commercial milk/pork production farm in your district?
   i.Yes ☐ ii. No ☐

16. Does the farms own ?
   i. feed production unit ☐ ii. pig farm/ dairy farm ☐
   iii. processing and packaging unit ☐ iv. All of the above ☐

17. What is the demand in your district for?
   i.**Pork Meat** :
   a. High ☐ b. Average ☐ c. Low ☐

ii. Dairy products:

a.High ☐ b. Average ☐ c. Low ☐

18. What is the average Kg. of pork meat sold in your farm in a month?

i. Below 100 ☐ ii. 100 to 300 ☐

iii.300 to 500 ☐ iv. Above 500 ☐

19. What is the average litres of milk produced for sale in your farm/month?

i.Below 500 litres ☐ ii. 500 to 1000 litres ☐

iii.1000 to 2000 litres ☐ iv. Above 2000 litres ☐

20. The current supply situation of piggery/ dairy products in your district is;

i. Satisfactory ☐ ii. Average ☐ iii. Unsatisfactory ☐

21. What is the biggest problem faced by dairy and piggery farmers?

i.Lack of capital ☐ ii. Lack of good quality breed ☐

iii.Lack of good quality fodder ☐ iv. Lack of skilled human resource ☐

v.Lack of knowledge ☐ vi. Others ☐

22. What is the number of employees/workers/assistants in your farm?

i.None ☐ ii. Below 5 ☐

iii. 5 to 15 ☐ vi. Above 15 ☐

23. What are your practices of rearing animals?

i. Grazing ☐ ii. Feeding ☐

iii. Both ☐ iv. Others ☐

24. Are there any commercial feed producers or suppliers in your locality?

i.YES ☐ ii. NO ☐

25. In which year did you start your dairy/ piggery farm? ……..

a.What was your total investment?

i.Below ` 100000 ☐ ii. ` 100000 to ` 300000 ☐

iii.`300000 to `500000 ☐ iv. ` Above 500000 ☐

b. Number of animals during Start- up:

i. Below 5 ☐ ii. 5 to 15 ☐

iii. 15 to 30 ☐ iv. Above 30 ☐

c. Number of animals at present :

i. Below 5 ☐ ii. 5 to 15 ☐

iii. 15 to 30 ☐ iv. Above 30 ☐

d. Approximate value of your Dairy/ Piggery farm at present:

i. ` 100000 to ` 300000 ☐ ii. ` 300000 to `500000 ☐

iii.` 500000 to ` 1000000 ☐ iv. Above ` 1000000 ☐

e. Approximate value/ percentage of investment spent on:

i. Feed/Fodder ☐ ii. Housing Mgmt. ☐

iii. Labour Mgmt. ☐ iv. Health care ☐

v. Miscellaneous. ☐

26. What is the average Net Profit earned from your Dairy/ Piggery enterprises per annum considering the last three years?

i.Below ` 50000 ☐ ii. `50000 to `150000 ☐

iii.`150000 to `250000 ☐ iv. Above `250000 ☐

27. When did you start to get profit from your Dairy/Piggery farm?

i.Within one year ☐ ii. Two years ☐

iii. Three years ☐ iv. Four years ☐

28. What type of market promotional activity is used to promote your enterprise?

i.Advertising through media ☐ ii. Word of mouth/Friends ☐

iii.Door to door publicity ☐ iv. Others ☐

29. What is the method of distribution of your products?

i. Direct selling ☐ ii. Through wholesaler ☐

iii. Through Retailer ☐ iv. Others ☐

30. Do you think, there are good market prospects for Dairy/Piggery Enterprises in Nagaland?

i.YES ☐ ii. NO ☐

31. Can Dairy/Piggery farming prosper without Government support?

    i.YES ☐ ii. NO ☐

32. Do you encourage our educated youth to take up Dairy/Piggery farming as a profession?

    i. YES ☐ ii. NO ☐

33. What type of breeding method do you follow for animals in your farms ?

    i. Artificial breeding ☐ ii. Natural breeding ☐

34. Your Suggestions and Comments:

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