INTRODUCTION
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The growth of human population in the developed countries is getting stabilised whereas the population is still increasing rapidly in developing countries of Africa and Asia. It has been estimated that by the year 2000 there might be an additional two billion people in the world (Allen, 1983) to depend upon natural resources and productivity. Therefore besides agriculture, livestock has a major role to play in world's food supply. Animal protein (milk, meat and eggs) is considered to be quality food available to human. Meat contains nearly all the nutrients which an animal is composed of. The FAO (1982) in its study "Agriculture towards 2000" estimated that annual production rate for consumption of all meat has to be increased in between 5-7 percent for the period 1980-2000.

It is obvious that there has been a tremendous pressure on the available cultivable land for production of cereals, pulses, millets etc. throughout the world to feed the ever growing human population, leaving practically very less land for animal production programme. Since the beef and milk production are intensive and labour oriented programme and not possible to achieve higher rate target through ruminants due to their relatively slow production cycle, therefore, FAO (1982) predicted that by the year 2000 the meat requirement of one third of the human population could only be satisfied by the supply of poultry, rabbit meat and pork production provided their productivity technology could be developed at a minimum space requirement.

The pork and poultry production calls for utilisation of concentrated feed which again depends upon items of human consumption. Therefore, efforts will have to be directed towards exploiting small livestock that are wholly or partially away from conventional feed comprising human food items. Vietmeyer (1985) has coined the term "microlivestock" to rabbit rearing for using in developing countries, as they could be raised within the home or home complex and could be fed with vegetable wastes and peelings, table scrapes and garden weeds without any competition with human feed items. In this direction, the rabbit has a number of characteristics that could make them practically viable meat producing micro livestock in developing countries, because of the facts that rabbits are of:
I. Small body size:

It has got a number of advantages in stock raising in developing countries as they require less feed and space to accommodate and a small carcass that can be consumed by a family in one meal.

II. Short generation and high reproductive potential:

The reproductive potential of rabbit is very encouraging. They, being induced ovulator, can be bred at any time of the year and even 24 hours after parturition. This indicated high productive potential under rearing conditions in rabbit. It has been found that it is quite easy to produce 4-5 litters per year comprising about 20 off-springs per doe per year. Moreover the young doe matures at an early age and becomes ready for productive cycle.

III. Utilisation of non competitive food:

It has been estimated that rabbit do not compete for grains meant for human consumption and can be successfully raised on grain free diets based on forage and by-products. Acceptable feed performances can be obtained by using green forages, vegetable waste, waste fruits and human food by-products such as rice bran, corn bran etc. Rabbits can use the forage protein more efficiently than other animals and can be raised even on high roughage ration as they have high food conversation efficiency (Gallardo, 1984).

IV. Quick growth:

With appropriate feeding, rabbit can attain a weight of 2 kg. within 8-10 weeks of age in developed countries. However, the growth rate is comparatively lower in developing countries although rabbits can reach market or consumable size much faster than any other livestock except birds. Rabbits grow rapidly and their growth rate is comparable in developing countries to that of broiler chicken (Rao et al., 1977)
HISTORY, ORIGIN AND ECONOMICS.

The origin and evolution of domestic rabbits are difficult to trace although the fossil record traces the order Lagomorpha, back to about 45 million years coinciding with the late Eocene period. However the leporid rabbit and hare appeared to have actually originated in Asia. The modern lagomorphs consist of two families, the Leoporidae and Otoridae containing 12 genera. These genera range from the highly successful hares and rabbits of the genera Lepus, Oryctolagus and Sylvilagus to that of other endangered genera and species. The bushmen hare of the South Africa of the genus Bunolagus may be extinct, as the only spices has not been seen since 1948. The Sumatran hare, Nesolagus nitidus has become rare in Indonesia, the American rabbit, Pentalagus furnessi of Japan and the Volcano rabbit, Romerolagus diazi of Mexico have become endangered.

All the breeds of present day domestic rabbits are known to be the descendants of European wild rabbit, Oryctolagus cuniculus. The Lagomorphs are divided into two major families, the rock rabbits or the Pikas and rabbit/hares. The rock rabbits are common inhabitants of mountainous region of Asia and North America. In contrast to other species of Lagomorphs, they are highly vocal with loud call or whistle and they inhabit rocky areas of talus. They collect grass and other vegetation, which they cut and cure into hay in the sun. These hays are stored in piles in the rock crevices to be used as winter feed. The pikas differ from domestic rabbit in a number of obvious characteristics besides their peculiar call. The pikas do not hibernate and both the sexes lack the typical sex organ and instead they have cloaca into which the faecal, urinary and reproductive discharges unlike rabbits are made. They have developed hindlegs than rabbits and sometimes resembling rodent in their appearance. The pikas are commonly seen in the high or medium mountain areas perching on rocks. Unlike rabbits which are basically nocturnal the pikas are diurnal being most active during the day.

The two main genera of the rabbits are the true rabbits, Oryctolagus and the cotton tail rabbits the Sylvilagus. The Oryctolagus includes the European wild rabbits and it's domesticated descendants. The Sylvilagus includes, a number of North American cotton tails like Eastern Desert, Brush, Marsh and Swamp cotton tail rabbits. Unlike other species the Marsh and Swamp cotton tails can readily swim.
Domestication:

The domestication of rabbit is shrouded in mystery. It is believed that the original site of domestication was the Iberian Peninsula, now the Spain and Portugal. The first rabbit husbandry was recorded in the early Roman times when rabbits were known to be kept within walled "rabbit gardens". These rabbits known to be reproduced within those garden enclosure and they were known to be captured and used for food. It is also known that during the Middle Ages, the sailing vessels distributed rabbits on various islands to be used as food by the sailors. As exploration of the world increased the European rabbits were further distributed by the sailors. In 1859, a single pair was released in Australian Victoria, and in 30 years time this pair gave rise to an estimated 20 million rabbits, and thus the wild rabbit became the serious problem in Australia and New Zealand. However, the European wild rabbit, when released in North America, it could not exist in significant number over there probably due to complex environmental factors and other depredatory reasons.

It has, however, been known that during the middle ages, the rabbits were kept in rock enclosures in England and some part of western Europe. Thus the domestication of rabbit probably began in the 16th century in Monasteries. By 1700, seven distinct colours have been known to be selected: non-agouti, brown, albino, dilute blue, yellow, silver and Dutch spotting. By 1850, two new colours and probably the Angora type hair had been developed and between this period and the present day many colours and fur type breeds have been selected leading to the pet breeds etc. (Cheeke et al 1987).

Economic potential of rabbits:

a) Backyard rabbitry:

The rabbit rearing can be advantageously made a small scale endeavour as a few does can be kept easily on backyard scale by the ladies, to produce enough meat to meet the needs of the family, simply using compound weeds, tropical forages, vegetable tops and table scraps as feed. Rabbits can act as a "bio-refrigerator" since the meat of the animal can be consumed by the family without the need for refrigerating storage. The rabbit breeds the year round, thus a continuous meat supply for the family and the neighbour, can be made with just a few breeding animals. Because, the existing characteristic of rabbits are their high biotic potential and this
high reproductive potential is of great importance and advantage in commercial production. The rabbit adapt themselves to both small and large scale production. France is one of the world's largest producers and consumers of rabbits. In the US there is interest in large scale commercial production with units having 500 to 1000 and even larger number of rabbit units. On the other side, many families kept a few does in their backyard to raise meat for the family. Therefore, the future of rabbitries for meat and fur looks bright both in small and large scale production. Because only a small space is required for raising rabbits, they are noiseless and adapt to a variety of conditions both in towns and cities. Even the physically disabled can take care of rabbitry.

b) *Meat of rabbits*:

The rabbit meat is a wholesome tasty product compared to other meats, being high in protein and low in fat, cholesterol, sodium, etc. The meat is amber white, fine grained, delicately flavoured, appetising and nutritious but low in calorific content. On the other side, the size of the carcass, fine meat quality and wide range of preparation suitably make it an excellent and economical meat for human use in any season round the year. The hospitals, hotels and institutions prefer it because of their suitability to different methods of preparations in most of the countries.

c) *Fur and skins*:

Although the main product of commerce is the meat, their skins are also important commercial products as the furs are used in the preparation of various apparel items such as children's garments, gloves, coat, toys, etc. There is a market for all size and colours of domestic rabbit skins, but market values vary depending upon seasons, fashions and purchasing capacity of the consumers.

The rabbit is among the world's most numerous fur bearing animal and represents more than 50% in volume in terms of the fur handled by the industry in Europe (Aguilera, 1977). Though its fur is not considered to be of very high quality, being less durable than that of other or mink, but it is much cheaper and through the skill of the dresser and dyer it can be made to feel and look more expensive furs.
of toys and such other articles. Moreover at the time of fur cutting by the felting industry, the skin can be shredded and a glue of very good quality can be extracted for use in furniture and other industries.

d) **Pharmaceuticals**:

In association with rabbit production for meat and fur, the preparation of pharmaceuticals products can be made. From the rabbit brain, biological product like thromboplastin can be prepared for medical use as anticoagulant to control or prevent human thrombosis, phlebitis and other abnormal clotting conditions of the human body. The blood can be utilised for preparation of complements for biomedical programmes. Various types of enzymes can be extracted from the rabbit tissues for preparation of medicines and utilization in biomedical research.

Moreover the rabbits can replace the other laboratory animals that are utilised by the biolaboratories for biomedical and other research in an economical way. Rabbits can also be used for Draize tests instead of nonhuman primates for assessing cosmetics by cosmetics companies.

**PHYSIOGRAPHY OF BARAPANI, MEGHALAYA**

The North Eastern Hill region has been divided into three broad geographical zones namely, the Eastern Himalayan Region, the Purvanchal Region and Meghalaya - Mikir Hill Region. The third zone comprises of the Khasi, Jaintia and Garo Hills constituting the state of Meghalaya.

The state of Meghalaya is one of the 'Seven sister States' of North Eastern India, is bounded by Assam on eastern and northern side and Bangladesh on southern and western side. It covers an area of 22,429 square kilometres and lies between 25°.47' and 20°.10' N and 89°.45' and 92°.45' East. The total population of the state is 1,77,4,778 as per 1991 census out of which 85.53 percent people are tribal.
The Meghalaya plateau is really an eastward extension of the massive block of peninsular India lying to the east of the great gap in the Archean terrain, subsequently filled up with alluvium deposits jointly by the river Ganges and Brahmaputra.

The organic movement was so slow and free bulking that the sedimentary beds retained their horizontal character and gave rise to structural platforms well developed in Cherapunjee area. From the Surma Valley in the south, the central and eastern parts of Meghalaya appeared to be an imposing table land bordered by a great scrap and steep sloping towards the plains. Water fall rush down the scraps and steep sloping towards the plains. The ascending monsoon clouds over the frontal slopes and the side valleys that made earlier Cherrapunji and now Mawsynram, the highest rainfall area in the world and justified the name Meghalaya (Megha the cloud and Alaya the abode).

Physiographically and administratively, the central east part of Meghalaya can be grouped together under the name Garo Hills, Jaintia Hills and Khasi Hills distinguishing themselves with their independent physiographic characteristics,

**Garo Hills :**

This hilly tract covers 800 square kilometres and made the river Brahmaputra to change its course from the west to south along its western edge. Two most important physiographic units of this hills are Tura range and Simsang valley. The highest peak of Garo Hills Nokrek (1,412 m) and the important river is Simsang river which separates Tura range from Kalyas range and ultimately coming down to plain changed the name of the river to Someswari near Bagnara.

**Khasi and Jaintia Hills :**

The central and eastern part of Meghalaya covers about 14,375 square kilometres. Physiographically this region may be subdivided into three sections, namely the northern hills, the central plateau and the southern hills.

The northern hill has an undulating hill topography, raising almost to the same height and extending northwards to the Brahmaputra. The summits of these hills found varied between 170 and 820 metres. The Nongpoh subdivision is lying half way between Shillong and
Guwahati standing on a flat top at 700 m height and characteristically a typical hill of this section.

The central plateau of the Khasi Hills covers about 500 square kilometre area. Its outer limit has been defined roughly by a 1500 m contour line. This plateau contains the remnants of uneven surfaces ranging in height from 1500, to 2,083 m. The highest altitude of Shillong is the Upper Shillong towering above the Shillong town, containing the highest paneplaned surface over which streams meander before plunging into the deep valleys of Umiam and Umkhen. To the south of Shillong near Mylliem occurs a typical tranitic topography with rounded hills and shallow valleys. Cherrapunji is situated further south of Shillong. From Cherrapunji the plateau slopes very gently towards south for about 6 km and then falls rapidly to the plains and the ground slopes occasionally conformed to high dips of sedimentary rocks.

Climate:

The geographical situation and topographic character of a region affect the climatic pattern. The climate of Meghalaya is characterised by coolness and extreme humidity, which are resultant of the great water surfaces and extensive forest covers in which continuous evaporation and condensation proceed and due to the close proximity of the hill ranges excessive precipitation takes place. Its most distinguishing features is the copious rainfall between March and May, when precipitation over upper plateau is at its minimum. The year is thus roughly divided into two season, the cold season and the rainy season. The hot season of the rest of India is being nearly absent. From the beginning of November till the end of February, the climate is cool but no period of the year is experiencing heat like the Assam valley.

On the Shillong plateau the temperature seldom rises above 27° C at the hottest season of the year and ice form in the shallow pools in the winter nights. The annual rainfall at Mawsinram averages 12934 mm, the highest ever precipitation in the world.

AGRICULTURE AND ANIMAL HUSBANDRY

Agriculture:

Agriculture is the main source of livelihood for over 80 percent of the population of Meghalaya. About 27 percent of the total cultivated area is under irrigation. The main crop of
the state is paddy followed by maize and wheat. In the oilseed section the following four crops namely sesamum, castor, rape and mustard are grown. Among the various commercial crops grown in the state are sugarcane, potato, sweet potato, tapioca and tobacco. Meghalaya has natural advantage in growing a variety of spices of which the prominent ones are turmeric, ginger, chillies, black pepper and bay leaf.

Meghalaya is blessed with tropico-subtropical and temperate climate which permits the cultivation of wide variety of horticultural crops. The important horticultural crops currently being grown in the state are banana, oranges, pineapple, papaya, jackfruit, plums, peach, pear etc. The state is known for its vegetables in the North east. The cabbage, cauliflower radish and squash are the important vegetables grown in Meghalaya and are regularly marketed outside the state.

**Animal husbandry**:

Animal husbandry in Meghalaya is an integral part of agriculture as most of the people, due to multifarious reason depend on animal for their economic support. The proportion of rural population in Meghalaya is 85 percent against all India average of 80 percent. This rural population of Meghalaya who are by and large agriculturists by occupation but their holdings are small for which they have found out the animal husbandry to be a better alternative. Moreover, the tribal people of Meghalaya are exclusively non vegetarian in their dietary habit and meat products are their first choice which probably attracted them to the animal husbandry.

The demand of milk is at present limited to the state capital and also developing townships as the indigenous rural population prefers meat over milk. The trend is however, changing gradually. Milk in the specified areas are made available from the crossbred cows. Shillong, the capital of Meghalaya was one of the places where crossbreeding of cattle was introduced during pre-independent era.

Almost every rural household in Meghalaya keeps a few pigs as a subsidiary source of income and 100 percent of tribal people are pork eaters. Meghalaya consumed nearly 3213.77 tonnes of pork in 1983-84 (Sherpa, 1991) for which about 15,000 pigs had to be procured every year from outside to meet their additional requirement of pork.
Beef is another preferred meat and it is consumed on a large scale in Meghalaya. However, there is neither any organised farm nor beef production nor slaughterhouse in the state. The demand of beef used to be met from migrating herds of cattle from neighbouring states.

Besides beef and pork, the farmers of Meghalaya rear goat and undertake poultry farming. Nowadays broiler chicken farming is gaining popularity.

**Rabbit husbandry and its justification**:

Rabbit is the comparatively new animal to be introduced as a livestock not only in Meghalaya but also in the North Eastern states as a whole even though its popularity is yet to come up.

The domestic rabbit has the potential to become one of the world's major livestock species. In the coming future with the increasing human population, pressure is on the available land for the production of cereals, pulses, millets, etc. and very limited land will be left for animal production programme. Since beef and milk production are labour intensive and land oriented and pork and poultry production calls for the utilisation of concentrated feed which could otherwise go to the human utilisation, therefore, efforts will have to be directed towards exploiting such table animals which have less competition with human food. This obviously justifies the introduction of rabbit farming in north east India due to agricultural land constraints. The rabbit possesses various attributes that are advantageous in comparison to other livestock as they can be successfully raised in a small area and on diets that are low in protein and high in roughage. It can convert forage into meat more efficiently than ruminant animals like cattle and sheep.

The ability of rabbits to convert forage into meat will be of special significance in north eastern states where food shortages are major problems. On the other hand, there is abundance of local vegetation and wild grasses that could be fed to the rabbit as food. A few does can be kept by families in their backyard to produce enough meat to satisfy the needs of the family using compound weeds, tropical forages, vegetable tops and table wastes as a feed for the rabbits. The rabbit will breed round the year. So a continuous supply of meat can be obtained with just a few breeding animals. The rabbits are known for their rapid growth rate, short
gestation period and ability to rebreed immediately after parturation. No other livestock has this amazing reproductive potential benefits. Therefore rabbitry has got tremendous potential throughout the North East Indian states, and thus justified the present research.