

## CHAPTER IV

### DISTRIBUTIONAL PATTERN OF LIVESTOCK IN NORTH SIKKIM AND THEIR ECONOMIC IMPORTANCE - AN OVERVIEW.

#### 4.1. INTRODUCTION.

Poultry and livestock rearing are important enterprises of the people of Sikkim. Livestocks in North Sikkim are generally found in three different ecological zones which could be summarised as follows:

Zones	Type of livestock
1. Dry High Zone (Lhonak and Chho Lhamo)	Yak Sheep and Pashmina type of Goat.
2. Continental Upper Zone (Lachen and Lachung)	Cattle, Yak, Goat, Equines and Pigs
3. Sub-Tropical Zone (Dzongu, Kabi, Phensang, Mangan etc.)	Cattle, Buffaloes, Goat, Pigs and Poultry.

Livestock is not only reared for milk and meat but it is a primary source of draught power and manure for agricultural farming. Unlike the other North Eastern states of India, cattle farming in Sikkim is widely practised as a mixed farming. A comparative account of poultry and livestock, their population dynamics and compositional changes are presented in this chapter.

#### 4.2. Varieties of Livestocks in North Sikkim.

North Sikkim which constitutes three fourth of the total geographical area of sikkim is an important repository of genetic variability of plants and animals. The animals mostly include

Yak, Sheep, Goat, equine and buffaloes etc. Table 4.1 presents different varieties of livestock along with their related wild species found in different climatic zones in North Sikkim. It will be seen from Table-4.1 that there are various domesticated and wild related species found in different climatic zones. As far as dry high zone is concerned the principal livestock include sheep, yak, Bhutia type goats and horses. The continental upper zone contains sheep and yak of different kinds, goat, Bhutia type horse, mules and donkeys and cattles, poultry and pigs of different kinds. Similarly, the subtropical humid zone sustains a number of domesticated species such as sheep, goats, cattles, poultry, pigs and buffaloes etc. However, poultry and pigs in this zone have wild related species. As far as the economic importance of these animals are concerned the table is self explanatory.

#### **4.2.1. Cattle**

The cattle population in the state is by and large nondescript. The local "Siri" cattles that predominate in number in the region are found upto an elevation of 4000m (plate 10). These animals are supposed to be very hardy and sure-footed. The cows of this local breed are poor in quality usually giving 400 to 600 litres of milk in a lactation of about 180 days, followed by a prolonged dry period. The selected cows of this breed may yield upto 1000 litres per lactation with fairly high fat percentage. Their function as the mother of efficient bullocks cannot be ignored especially because in Sikkim owing to hilly and mountainous terrains, farm mechanization to its optimum level has not been possible as yet. The bullocks are found to be generally agile, sure-footed and are mostly reputed for good draftability in rugged and mountainous terrains of North Sikkim (plate 11). Next to "Seri" the crossbred animals with varying exotic blood namely Jersey.



**Plate 10. A local "Seri cow at Rabum state Animal Husbandry farm (North Sikkim).**



**Plate 11. Bullocks - a source of farm power (Lingthem-Dzongu)**

**Table 4.1**

**VARIETIES OF LIVESTOCK AND THEIR RELATED WILD SPECIES  
FOUND IN DIFFERENT CLIMATIC ZONES OF NORTH SIKKIM.**

SI. No.	Type of Livestock Domesticated.	Name of the related wild species.	Economic Importance
1	2	3	4
<b>DRY HIGH ZONE.</b>			
A. Sheep			
1.	Tibetan sheep	Bharal or Blue sheep ( <i>Pseudois nayaur</i> )	The domesticated sheep for wool and meat. The meat from this zone are prized meat and very expensive. The wild animals are hunted for meat and fur.
2.	Sikkimese sheep Bhera or banpala	Nayan or great Tibetan sheep ( <i>Ovis ammon hodgsoni</i> ).	
B. Yak			
1.	Yak ( <i>Bos poiphagus grunniens</i> ).	No record of wild yaks	the domesticated yaks are used for milk, meat, skin transportation, fuel and riding. The wild species is extinct in Sikkim.
C. 1. Chengra (Bhutia) type Hairy (Cashmere) goat			
		Himalayan Tahr ( <i>Hemitragus Jemlahicus</i> )	The domesticated goats are used for hair, meat, skin etc.

## D. Equine

- |                      |                              |  |
|----------------------|------------------------------|--|
| 1. Bhutia Type Horse | Kyang ( <i>Equus Kiang</i> ) | Domesticated horses are used for riding and transportation. Not much in use in this area owing to high altitude. |
|----------------------|------------------------------|--|

**CONTINENTAL UPPER ZONE.**

- |  |  |   |
|--|--|---|
| A. Sheep   | Sheep-wild   | Domesticated Sheep used for wool and meat   |
| 1. Tibetan sheep                                     | Most of the wild sheep   |   |
| 2. Sikkimese sheep<br>Bhera or Banpala<br>or Garpala | found in the Dry High<br>zone migrate to conti-<br>nental upper zone<br>during winter. |   |
| B. Yak   |  |   |
| 1. Yak   | No record of wild yaks   | Yaks are used for milk,<br>meat, hair and hide. The<br>tent made out of yak<br>hair are rain and snow<br>proof. |
| 2. Dzo (yak &<br>Cattle Cross)                       |  |   |
| C. Goat  |  |   |
| 1. Changra (Bhutia<br>type) Goat.                    | No record of wild<br>goats.  | The domesticated goats<br>are used for hair, meat<br>and skin.  |
| D. Equine (Domesto-                                  | Equines  | Riding and transportation   |
| 1. Bhutia Type                                       | Kyang do not migrate   |   |
| 2. Mules   | to this zone in winter.  |   |
| 3. Donkeys   | Perhaps to Tibet   |   |

E. Cattle	Not available	Meat, milk and hide and manure and draft
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1. Seri type
2. Jersey cross

F. Poultry

- |  |                         |            |
|--|-------------------------|------------|
| 1. Indegenous Fowl                         | Found in lower areas    | Meat, Eggs |
| 2. Cross breedsaddle Back and Large white. | of the continental zone |            |

SUB-TROPICAL HUMID ZONE.

A. Sheep Banpala & Garpala	Not available	Meat and wool for making raris (carpet)
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B. Goat	Not available	Goat in this zone are reared for meat and milk
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1. Local Singhali
2. Black Bengal
3. Jamunapari
4. Crosses

E. Cattle	Not available	Meat, milk and hide and for draft and manure.
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1. Local `Seri' type
2. Jersey Cross
3. Holstein Freesian cross.
4. Swiss brown cross.

F. Poultry	1. Red Jungle Fowl( <i>Gallus gallus</i> )	Domesticated birds are reared for eggs and meat and wild species for hunting.
1. Local Fizzle Fowl		
2. Local Fowl		

3. Rhode Island Cross 2. Kaliz (*Lopura Leucomelanura*)  
4. White Leghorn Cross.

G. Pigs	Wild pigs ( <i>Sus scrofa</i> )	Meat and manure
1. Lepcha type		
2. Cross Bread-Saddle		
Back, Hampshire,		
Large White.		
H. Buffaloes	Not available	Population is very small and reared for milk and meat.

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Brown Swiss, Ayshire, Holstein etc. are found in the region. Most of these crossbred animals were brought from the nearby hills of Kalimpong and Darjeeling where a number of exotic cattles were introduced by the early British Tea planters. In addition, the State Government also purchased a pure Jersey herd of 50 heifers and two bulls from Australia way back in 1954 and another herd of pure Jersey of 50 heifers and three bulls were imported from Denmark in 1980 through National Dairy Development board. Artificial insemination has been introduced in the State with frozen semen with effect from 1987 which has become very popular with the small and progressive farmers of North Sikkim. The breeding bulls are, however, being used in far flung hill and remote areas of North Sikkim.

#### 4.2.2. Sheep and Goat

As has been said earlier India has vast genetic resources of Sheep and as many as 40 breeds are adapted to different agro-ecological conditions in the country. In North Sikkim, the two

recognized breeds are Tibetan breed and Banpala breed. Both of these breeds have been classified under superior carpet wool breeds.<sup>23</sup> However, the Banpala breed should have been classified under coarse carpet wool breed as the wool is coarse, As regards the Tibetan breed, (Plate 15) the sheep is of medium sized, mostly white with black or brown face, brown and white spots are also found on the body. Both the sexes are horned. The ears are small, broad and drooping. The belly legs and faces are devoid of wool.

Compared to the Tibetan sheep, the Banpalas are tall, leggy and well built. The body colour ranges from completely white to completely black with a number of intermediary tones. The ears are small and tubular. Both the sexes are horned. The tail is thin and short. The belly and leg are devoid wool. The average body weight is about 35kg. which produces about 1kg of hairy wool per annum. The other breed which is very similar to that of Banpala breed is brown as "gharpala" or home reared. The exotic sheep breeds introduced in Sikkim for upgrading the local sheep are Russian Merinos, Corridale and Rambouillet etc.

As shown in Table 4.1 the two related wild sheep found in North Sikkim are Bharal or Blue sheep (*Pseundois nayaur*) and Nayan or great Tibetan sheep (*Ovis ammon hodgsoni*). Both of these wild varieties have been classified under Schedule I of the wildlife (Protection) Act 1972.

Goat is a very popular domestic livestock with the farmers in Sikkim. It is reared mainly for meat. At Lhonak and Chho Lhamo Grazing grounds a local hairy pashmina Goat variety called "Chengra" in Bhutia language is reared in limited numbers. The goats in the sub-tropical zones are mostly stall fed and the important local breed is called "Singhali" in Nepali

23. Achary, R.M. Sheep production. In (Tata, S.N. and Lokeshwar, R.R. eds. Hand book of Animal Husbandry, New Delhi, Indian Council of Agricultural Research. 1990. p 43-118.

language. As compared to Black Bengal variety, it is generally bigger in size. The goats with considerable Black Bengal breed are also reared in the lower sub-tropical zone. The breeds introduced in Sikkim for upgrading the local goats include Jamunapari, Barbari, Beetal and pashmina goats imported from Ladakh. A photo of crossbred pashmina goat with local "Chengra stock could be seen in Plate 12.

### 4.2.3. Yak

Yak has a special place in the economy of people inhabiting areas with an altitude ranging from 2500m above sea level in North Sikkim. According to the classification of vertebrate animals the domesticated yaks fall in the bovidae family, the sub family being Bovinae. The scientific terminology is *Bos grunniens* or *Bos poiphagus*.<sup>24</sup> It has identical number of diploid chromosomes i.e. 60 (2m=60) like cattle.<sup>25</sup>

Yak is widely known for its ability to withstand low temperature, sure-footedness and capability to thrive on coarse fodder at sufficiently high altitude where no other large animal can survive. It is the only species which produces milk, meat and hair fibres etc. It is a very popular medium of transport in high altitude areas (plate 13). Yak is an exceptionally hardy animal and is extremely popular with the tribes of Lepcha and Bhutia on account of its surefootedness and ability to thrive even in severe winter with snow environment. Yaks hoofs are as big as those of a camel and can obtain a very secure foothold in glaciers and rocks. "It can graze comfortably in places where cattle and horses would find footing only with great difficulty" - FAO (1949) and can also dig through snow for fodder. Thus yak is called the "camel of the snow". There are three types of yaks found in sikkim which include Lhogyag, Bod-gyag and A-Yu. Lho-gyags are generally large animals as compared to Bod-gyag and A-Yu.

24. Hoffparuir, R. India's other Bovine. A Cultural Geography of the water buffalo. The university of Wisconsin, USA. 1974. p 45-46.

25. Zuitin, A.I. New data on the cromosome number in Yak (*Poephagus grunniens* L). Doke, Akad, Nauk NS. 19. 1938. p 201-202



Plate 12. Pashmina goat introduced from Ladakh-good prospect in North Sikkim.



Plate 13. Yak is used for riding in the Dry High Zone of Lhonak & Chho Lhamo areas.

The A-Yu yaks are normally pooled yaks. Out of the above three yaks "Lho-gyags" are supposed to be the best Yaks in Sikkim.<sup>26</sup> Crossbreeding between Yak and local cows is practised in Sikkim on a limited scale. The cross-bred progeny between Yak bull and local female cows is called "Dzo". The male "Dzo" is sterile. The female "Dzo" normally yields more milk (3-4 litres) per day. They seem to be hardier and can tolerate high temperatures at lower altitude. Whereas the pure Yaks cannot thrive at lower altitudes. The crossbred male "Dzo" is widely used in North Sikkim as drought power and is best suited in the hill terrain of the region specifically for transportation.

#### **4.2.4. Piggery**

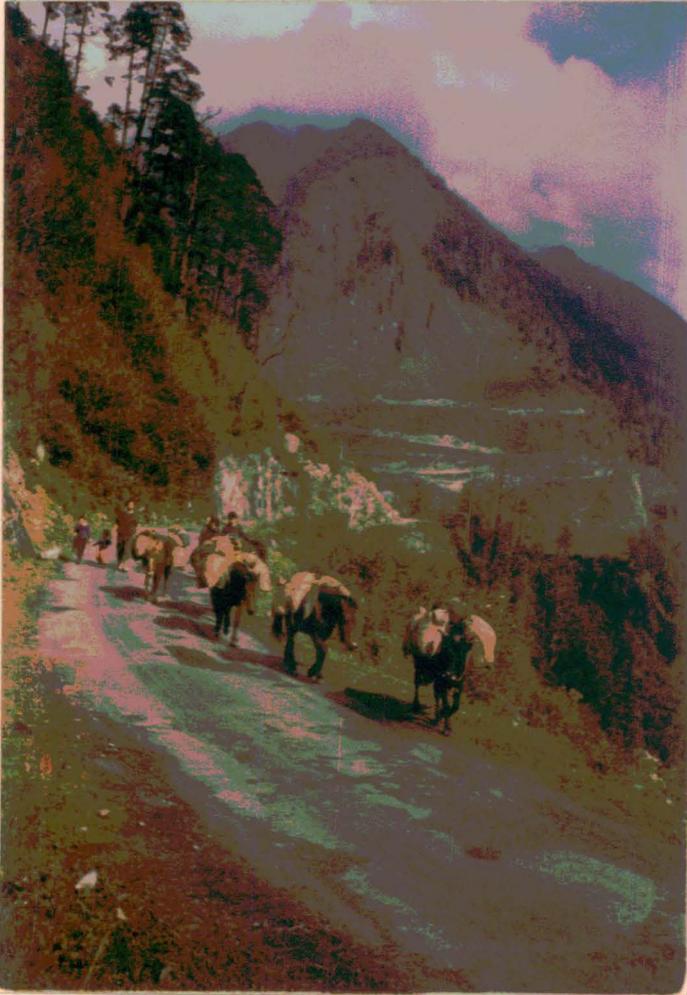
The pigs are reared by the farmers especially in the sub-tropical zone (Table 4.1). The indigenous and the small black swine varieties were contributing substantially to the pig production until 1970 in North Sikkim. Improved breeds like saddle Back, Yorkshire, Hampshire and large white are being used at present for upgrading indigenous local varieties. The farmers in North Sikkim usually prefer black colour pigs which are varieties such as Hampshire and saddle Back breeds like the other very much popular in North Sikkim. Wild pig (*sus-scrofa*) too are found in the forests of sub-tropical zone in North Sikkim. These are mainly hunted and trapped for supplementing the protein requirements of the people.

Ponies are indigenous "Bhutia" breed found in North Sikkim. However, the mules are used for transportation purposes in the region (Plate 14) where road transport by other means is rather difficult.

26. White, J.C. Agriculture in Sikkim. In (Gazetteer of Sikkim. Calcutta, 1894. Reprinted by Sikkim Nature Conservation Foundation, Gangtok. 1989. p 74-79.

#### 4.2.5. Poultry

The poultry breeds in North Sikkim are mostly local and non-descript. The two types of local indigenous breeds include Frezzle fowls and Naked neck fowl. The improved breeds available with the farmers in North Sikkim are Black Australop cross, Rhode Island Red crosses and white leg horn crosses rearing of commercial hybrid broiler and layers are also being popularized by the department of AH & VS. There are two types of wild fowl i.e. Red Jungle fowl (*Gallus gallus*) and Kaliz (*Lophura Leucomelamura*) which are generally found in the jungles of sub-tropical zones in North Sikkim. These birds are also hunted and trapped for meat to supplement the food requirements of the people in the region.



**Plate 14.**  
Horses mules are still being used for transporting goods in North Sikkim. Background- Zema state A.H. fodder demons. centre.



**Plate 15. Tibetan Sheep grazing in the Lhonak pastureland.**

Table - 4.2

## COMPOSITION OF LIVESTOCK IN NORTH SIKKIM

SL.No.	TYPE OF ANIMAL	1977		1982		1987		% age of change over 1977 to 1987
		No.	% age to total	No.	% age to total	No.	% age to total	
<b>1. Cattle</b>								
(a)	Adult male	4531	8.22	3128	4.82	3199	4.50	-29.40
(b)	Adult female	5618	10.20	4571	7.05	5074	7.14	-9.68
(c)	Young stock	4096	7.44	5804	8.95	6314	8.89	54.15
	<b>Total cattle</b>	<b>14245</b>	<b>25.86</b>	<b>13503</b>	<b>20.82</b>	<b>1458</b>	<b>20.53</b>	<b>2.40</b>
<b>2. Buffalo</b>								
(a)	Adult male	44	0.80	16	0.20	1	0.00	-97.73
(b)	Adult female	108	0.20	58	0.09	5	0.001	-95.37
(c)	Young stock	79	0.14	53	0.80	4	0.01	-94.94
	<b>Total Buffalo</b>	<b>231</b>	<b>0.42</b>	<b>127</b>	<b>0.20</b>	<b>10</b>	<b>0.01</b>	<b>-95.67</b>
<b>3. Yaks</b>								
(a)	Adult male	447	0.81	736	1.14	1104	1.55	146.98
(b)	Adult female	1102	2.00	1100	1.70	2027	2.85	83.94
(c)	Young stock	791	1.44	825	1.27	1734	2.44	119.22
	<b>Total Yaks</b>	<b>2340</b>	<b>4.25</b>	<b>2661</b>	<b>4.10</b>	<b>4865</b>	<b>6.85</b>	<b>107.91</b>
4.	Sheep	3977	7.22	2556	3.94	3627	5.10	-8.80
5.	Goat	8864	16.09	11638	17.95	11871	16.71	33.92
6.	Other animal	725	1.32	804	1.24	1186	1.67	63.59
7.	Pigs	1520	2.76	3269	5.04	3958	5.57	160.59
8.	Poultry	23287	42.09	30283	46.70	30947	43.56	33.46
<b>Grand Total</b>		<b>55089</b>	<b>100.00</b>	<b>64841</b>	<b>100.00</b>	<b>71051</b>	<b>100.00</b>	<b>28.97</b>

### **4.3. Population Dynamics and compositional change of livestock including poultry in North Sikkim.**

Keeping the above discourse concerning the genetic characteristics and the varieties of livestock found in North Sikkim in view, it will be meaningful to throw light on the population dynamics and compositional change of the livestock and poultry in this region. Table 4.2 shows the poultry and livestock population in different census years in Sikkim.

It will thus be seen from Table 4.2 that the number of total poultry and livestock in North district has increased by about 2887. As far as the composition of the total livestock population is concerned it could be seen that in North Sikkim the proportion of poultry in the total livestock population has been recorded to be the highest in 1987 as against 42.09 percent in 1977. During 1977 to 1987 the poultry population shows an increasing trend registering a growth rate of about 33.46 percent. Next to poultry comes cattle which occupies the second highest position in the total livestock population of North Sikkim. Cattle accounted for as much as 20.53 percent in 1987 as against 25.86 percent in 1977. During 1977 to 1987 the population of cattle has thus increased by about 2.40 percent only. There is a decreasing trend in adult male and adult female cattle population during the same period i.e. from 1977 to 1987 showing a negative growth rate i.e. -29.40 percent over the decade. Similarly, there has been a negative growth rate of adult female cattles, the percentage growth rate being -9.68 percent over the decade i.e. 1977-1987. However, during the same period there has been a substantial increase in Young stock cattles accounting for 54.95 percent growth rate.

From the above situation, it could be inferred that the negative growth rate in case of adult male and female cattles may

be largely due to gradual phasing out of the indigenous varieties and introduction to high mortality or culling rate among the adult cattles which need further research and investigation. In order to explain this compositional change, the growth rate on cattle population was further analyzed on the basis of breed. the details in this regard are presented in Table 4.3.

Table 4.3

Trend of growth rate of Cattle Population in North Sikkim Types of Cattle Population

Year	Cross Bred Cattle No.	%age	Indigenous cattle No.	% age
1977	Not available	-	14,245	100.00
1982	1852	12.06	13,503	87.93
1987	2930	20.05	11,684	79.95
<b>Total Growth rate -</b>		598.27	-	(-) 79.47
<b>Annual growth rate -</b>		11.67	-	(-) 2.69

It is to be noted that direct information on the number of crossbred cattles in the state was not available till 1982 livestock census. From 1982 onwards, the livestock census conducted at five year intervals has been recording information of cattle by crossbred and indigenous categories. The results of the livestock census for 1982 and 1987 on cattle population presented in Table 4.3 reveal that the proportions of crossbred cattle population to the total cattle population in North Sikkim were 12.06 percent and 20.05 percent for 1982 and 1987

respectively. During the period 1982-87 the crossbred population has increased by 58.25 percent. Such rise in crossbred cattle population in North Sikkim may be attributed to a number of factors. The factors include the extensive cross-breeding programme under-taken by the department of AH and VS, the distribution of crossbred heifers cows under Tribal Development programme, integrated rural development programme through the commercial banks and last but not the least the facility provided by Sikkim Livestock Development Corporation for procurement of milk in early eighties from the rural areas to be distributed in Mangan town after its processing by simple method of heating and cooling. The above factors gave a big push for the diffusion of crossbreeding since the early eighties and have resulted in significant increase in percentage of crossbred cattle population. It is also sidely observed that the farmers are doing away with the local unproductive cattles and are going in for high producing cattles particularly crossbreds. The crossbred cows not only produce more milk but their growth rate and breeding efficiency are much better than that of the local indigenous cows.

Next to cattle, goat rearing is becoming popular in North Sikkim. The proportions of goat population to the total livestock population were 16.09 percent 17.95 percent and 16.71 percent for 1977, 1982 respectively. The goat rearing is generally discouraged by the state Forest Department as these animals cause considerable damage to the vegetation cover. However, despite this, the population of goats has increased considerably from 16.09 percent to 33.92 percent during a period 10 years i.e. from 1977 to 1987. The main reason of increase of goat population is that the goats do not just provide their owners with milk, meat and other products, but also serve other important economic investment and security and also fulfilling many other social obligations. <sup>27</sup>

27. Peacock, C. Improving goat production in the Tropics. In (A manual for development workers, Africa Oxfarm. 1994. 35p).

The proportion of Yak population to the total livestock population was 4.25 percent in 1977. However, this proportion has decreased to 4.10 percent in 1982, the figure has more than doubled the growth rate being 107.91 percent during the period 1977 to 87. The main reason for such an increase in yak population in the state could be attributed to high degree of awareness among the farmers regarding yak health care and timely vaccinations undertaken by the department of animal Husbandry and veterinary services.

The pig population registered the highest increase during 1977 to 1987 by about 160.59 percent even though its proportion to the total livestock population only 2.76 percent in 1977, 5.04 percent in 1982 and 5.57 percent in 1987. There has been a decreasing trend in buffalo population the percentage growth rate being (-) 95.67 percent during the period 1977 to 1987, it is a heavy animal and is generally suitable for grazing in the steep slope of North Sikkim.

Next to buffalo, sheep population is also observed to be having a negative trend of growth, the growth rate being - 8.80 percent during 1977 to 1987. It may be seen from the Table 4.2 that the proportion of sheep population to the total livestock population shows an increasing trend during 1982-1987. The figure was 3.94 percentage 1982 and has increased to 5.10 percent in 1987. It could also be seen from the said table that the proportion significantly dropped from 7.22 percent in 1977 to as much as 3.92 percent in 1982. Owing to high rainfall and high humidity prevalent almost throughout the year, the exotic sheep have failed to perform well in the state and more over with the closure of All India co-ordinated sheep project in Sikkim the number of crossbred sheep population has declined dramatically.

As far as the other categories of animals are concerned these mostly include horses, mules, ponies and donkies. During sixties these animals formed the major proportion of livestocks in the number of these valuable eco-friendly animals have gradually gone down. The animals are still used for transporting goods in North Sikkim (plate 14). The proportion of the other animal to the total livesock population was 1.32 percent in 1977, 1.24 percent in 1982 and 1.67 percent in 1987. The percentage change in population of these animals is found to be 63.59 percent during 1977 to 1987.

#### **4.4 SAMPLE SURVEY OF LIVESTOCK POPULATION IN NORTH SIKKIM.**

This chapter primarily deals with the varieties of poultry and livestock along with their composition and population dynamics. However, data on the zone wise distribution of livestock are not available. As per the design of the study indicated in chapter-I a sample survey was conducted to determine the livestock population and their distribution pattern in the three identified ecological zones in North Sikkim. In this survey a total households of 827 were covered in the three eco-zones of North Sikkim, the altitudes ranging between 800 m. to 5500m. above the sea level. The results of the survey that incorporate the zoanwise details of households covered, types of livestocks along with their population concentration etc. have been presented in Table 4.4. It will be seen from the appendix Table 4.1 that in the dry high Sikkim as many as three types of livestock species are reared including yak, sheep and pashmina type of goat. Out of the two identified regions in this zone, As far as the total number of livestock in this zone are concerned, i.e. 4497 heads Lhonak alone accounts for as much as 71.27 percent or 3205 numbers out of total 4497 livestock.

Switching over to the continental zone, it is well observed that almost all livestock species belonging to different categories are found here. In this zone, there is substantial variation in livestock population between Lachen and Lachung. Out of the total livestock of 4959 in this zone 3380 which accounts for 68.16 percent of the total have been recorded in Lachen and the rest i.e. 31.84 percent are found in Lachen. In case of poultry population there is not much difference between the regions.

In the sub-tropical humid zone, the important livestock species reared are cattle, goat, pigs and poultry. The highest number or livestock populations in the sample survey have been recorded for Kabi village with 897 numbers. The Tingda with 646 numbers and Chungthang with 621 numbers respectively. In the Dzongu area Hee-Gyathang has the highest livestock population with 547 numbers.

As far as the population of poultry birds are concerned 88.56 percent of the total poultry is found in this zone alone. This is in view of the fact that the climate is warm and very congenial for poultry production. The highest poultry population is found in Kabi which possesses 20.40 percent of the total followed by 12.36 percent for Lingthem (Dzongu) and 11.34 percent for Chungthang.

#### **4.4.1 SPATIAL DISTRIBUTION OF VARIOUS SPECIES OF LIVE STOCK.**

In order to determine the spatial distribution of various livestock species in north Sikkim the number of each species of livestock were converted into percentages which have been pre-

sented in Appendix IX. The following picture emerges from the spatial variation of the percentages of different livestock species in the study area.

#### 4.4.1.1 YAK POPULATION.

It has been said earlier that the yaks are mostly found in the dry high and continental upper zones of North Sikkim. Table 4.4 and Fig. 10 presents the distribution of yak population in North Sikkim.

**Table 4.4**

**Distribution of yak population North Sikkim.**

SI. No.	Percentage Interval.	Class Category	No.of Blocks.	Name of Blocks.
1.	15 - 20	Low	1	Lachung
2.	20 - 25	Moderately low	1	Chho-Lhamo
3.	25 - 30	Moderate	1	Lhonak
4.	30 - 35	High	1	Lachen

It may be seen from the Appendix IX. yak population in the region varies between as low as 17.97 percent to the total yak population to as high as 34.33 percent for Lachung and Lachen respectively. Such high percentage of yak population in Lachen may be attributed to favourable climatic and environmental conditions for the survival of this animal. As far as the special distribution of yaks in north sikkim is concerned it will be seen from the table 4.6 that only one developmental block i.e Lachung comes under the arbitrary class interval varying between 15 to 20

# DISTRIBUTION OF YAK POPULATION IN NORTH SIKKIM

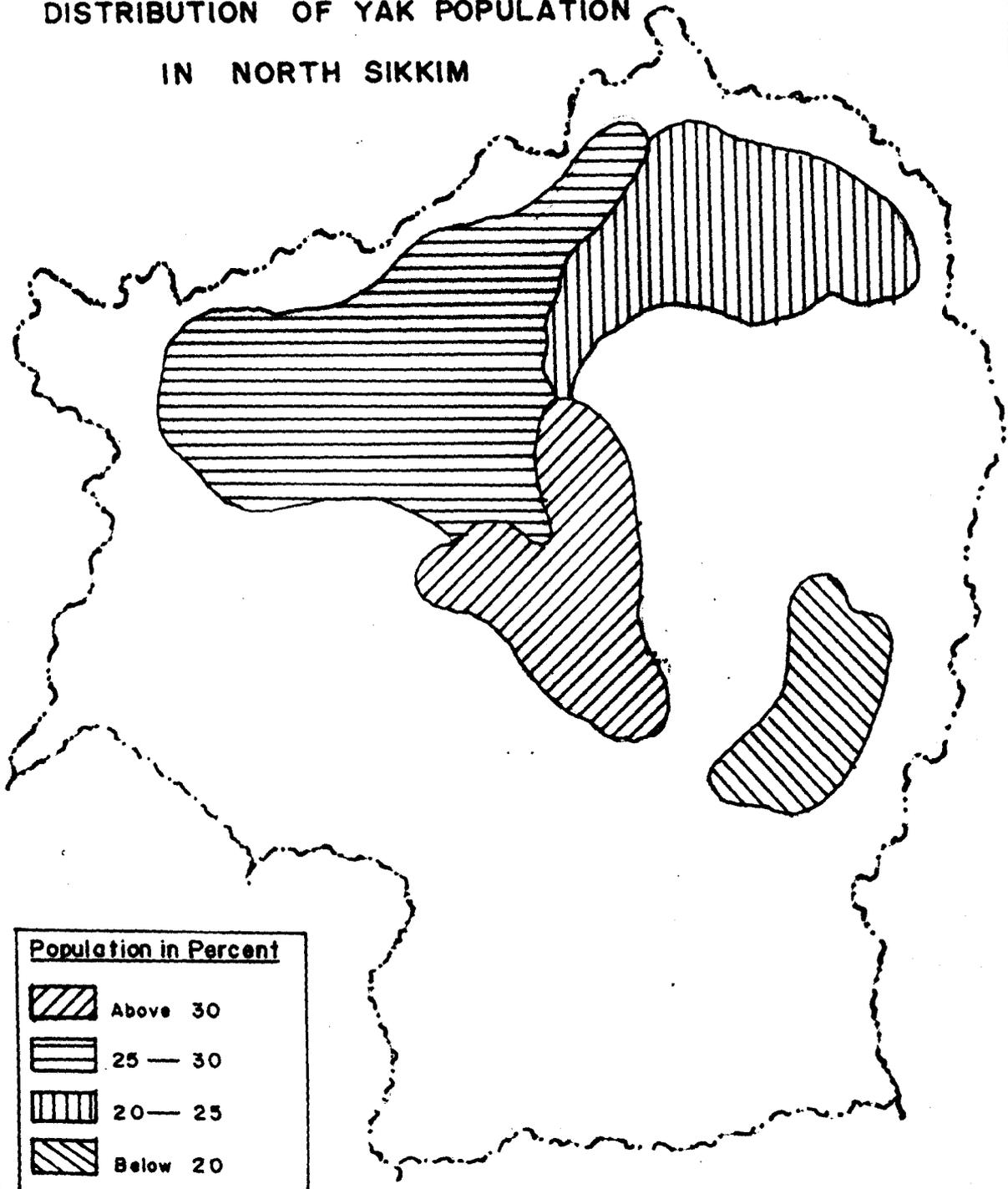


Fig 10.

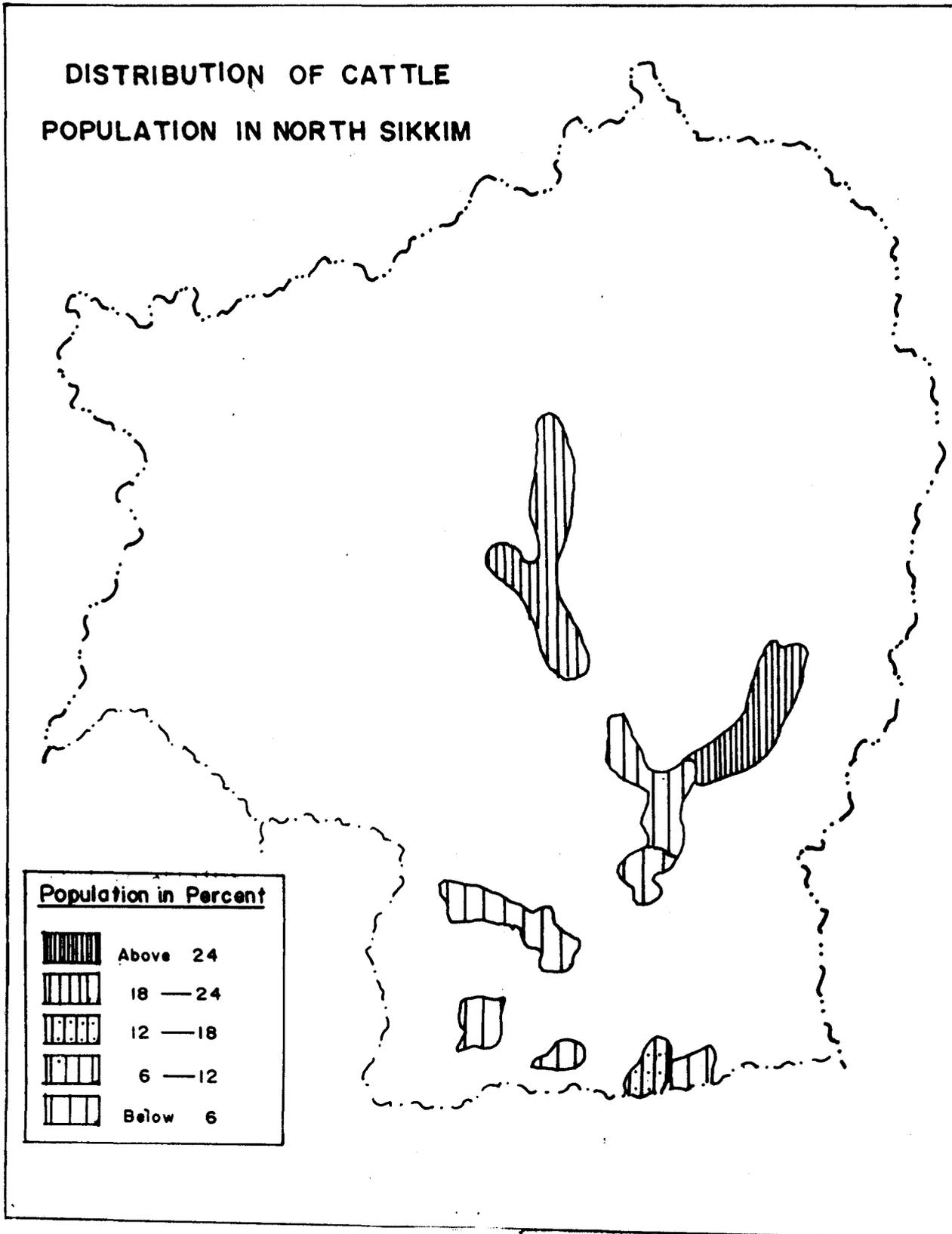
percent that exhibits low percentage of yak population. Such low percentage of yaks could be due to multiple reasons including environmental, economic and so on and so forth. As yak is a high altitude animal environmental factors are deemed to be the most important for the survival of these animals. Lachung being situated 2633 metres altitude supports very few yaks because of the fact that their grazing grounds are not as extensive as that of Lachen and people of Lachung cultivate off season vegetables like cabbage and other continental vegetables compared to Lachen.

Next to Lachung comes Chho-Lhamo which has a moderately low percentage share of yak population the percentage being 20.66 percent. Lhonak in north Sikkim possesses a moderate share of yak population i.e. 26.74 percent to the total yak population in the entire region. There is only one development block i.e. Lachen which has the highest percentage share of yaks in the entire region. As has been explained earlier, such high percentage of yaks in Lachen may be largely due to favourable environmental conditions that stand responsible for the high populations growth of these animals.

#### **4.4.1.2. CATTLE POPULATION**

Cattle is the most important livestock in North Sikkim as far as the economic significance of this animal is concerned Table 4.5 4.2 percents the distribution of cattle in North Sikkim. The distribution of cattle population in North Sikkim is shown in Fig. 11.

**DISTRIBUTION OF CATTLE  
POPULATION IN NORTH SIKKIM**



**Fig.11.**

**Table - 4.5****Distribution of cattle population in north Sikkim.**

Sl. No.	Percentage Class interval.	Category	No. of blocks.	Name of Blocks.
1.	Less than 6	very low	11	Shipgear, Naga, Namgor, Pakshep, Kazor, Singhik, Hee-Gyathang, lingthem, Gnon-Samdong, Tingda, Ramthang Mangan. lingthem.
2.	6 -12	low	1	Chungthang
3.	12 -18	Moderate	1	Kabi
4.	18 -24	high	1	Lachen
5.	24 and above	Very high	1	Lachung

In north district majority of the blocks located in the sub-tropical zone have cattle population the percentage share being less than 6 percent. The block falling in the very low category of cattle population include shipgear, Naga Namgor, Pakshep, Kazor, singhik, Hee-gyathang, Lingthem, Gnon-Sandong, Ramthang, Tingda and Mangan. However, Chungthang block has low concentration of cattles population the percentage being 7.63 percent to the total cattle population. Similarly the Kabi block with moderate concentration of cattles possesses 12.01 percent of the total cattle population in the entire north Sikkim. the very high percentage of cattles in Lachung is followed by high percentage at Lachen. As far as the distribution of cattles in north Sikkim in different areas are concerned, it could

be inferred that as many as 12 blocks have low percentage share of cattles to the total cattle population in the region. Only one block i.e. Kabi could be termed as having medium share of cattle population. However, only two blocks such as lachen and lachung have high cattle concentrations in the entire region. Such high percentage share of cattles to the total livestock in these blocks could be attributed to favourable environmental & socioeconomic conditions such as availability of large expenses of pastures, resources of water, moderate temperature conditions etc. incentives to farmers, good extension services, services from financial institutions in terms of loans, subsidy from the state government etc.

#### 4.4.1.3. GOAT POPULATION

Goat is the only animal found all over north Sikkim from dry high zone to sub-tropical zone. The percentage distribution of goat is given in Table 4.6.

**Table- 4.6**

#### **Distribution of goats in North Sikkim**

Sl. No.	Percentage Class interval	Category	No.of villages.	Name of the villages.
1.	Less than 5	Very	8	Chho-Lhamo, Lachung shipgear, Pakshep, Gnon-Sandong, Kazor Naga Namgor, Ramthang.
2	5 -10	low	6	Lhonak, Chungthang, Lingthem, Mangan.
3.	10 -15	Moderate	2	Kabi, Lachen
4.	15 and above	high	1	Tingda.

It may be seen from the Table 4.8 that 47 percent of the sample villages fall in the low category of goat population the percentage share being less than 5 percent. Similarly as much as 35.29 of the total sample villages have low goat population the percentage shares ranging between 5 to 10 percent. Only one village i.e. Tingda has high goat population of which comes under the percentage interval of 10 to 15 percent. A glance at table 4.8 reveals that there are as many as 14 village which have low goat populations. However, only one village has the highest percentage share of goats. Such high goat population in this village may be due to favourable socio-economic and environmental conditons factor may be high profitability in terms of cash return in case of this animal. The distribution of goat population and the sample villages in north Sikkim is shown in Fig 12.

#### **4.4.1.4. SHEEP POPULATION**

The percentage distribution of sheep population is presented in Table 4.7 and Fig. 13. The very high percentage of sheep population i.e above 27 percent is found in only one block i.e Lhonak. This is followed by Lachen with high sheep population the percentage shares varying between 18 to 27 percent. Chho-Lhamo could be termed as having moderate sheep population the percentage share to the total sheep population following under the percentage class interval varying between 9 to 18 percent. However, Lachung has the lowest sheep population having below 9 percent of the total sheep population in the region.

**DISTRIBUTION OF GOAT POPULATION  
IN NORTH SIKKIM**

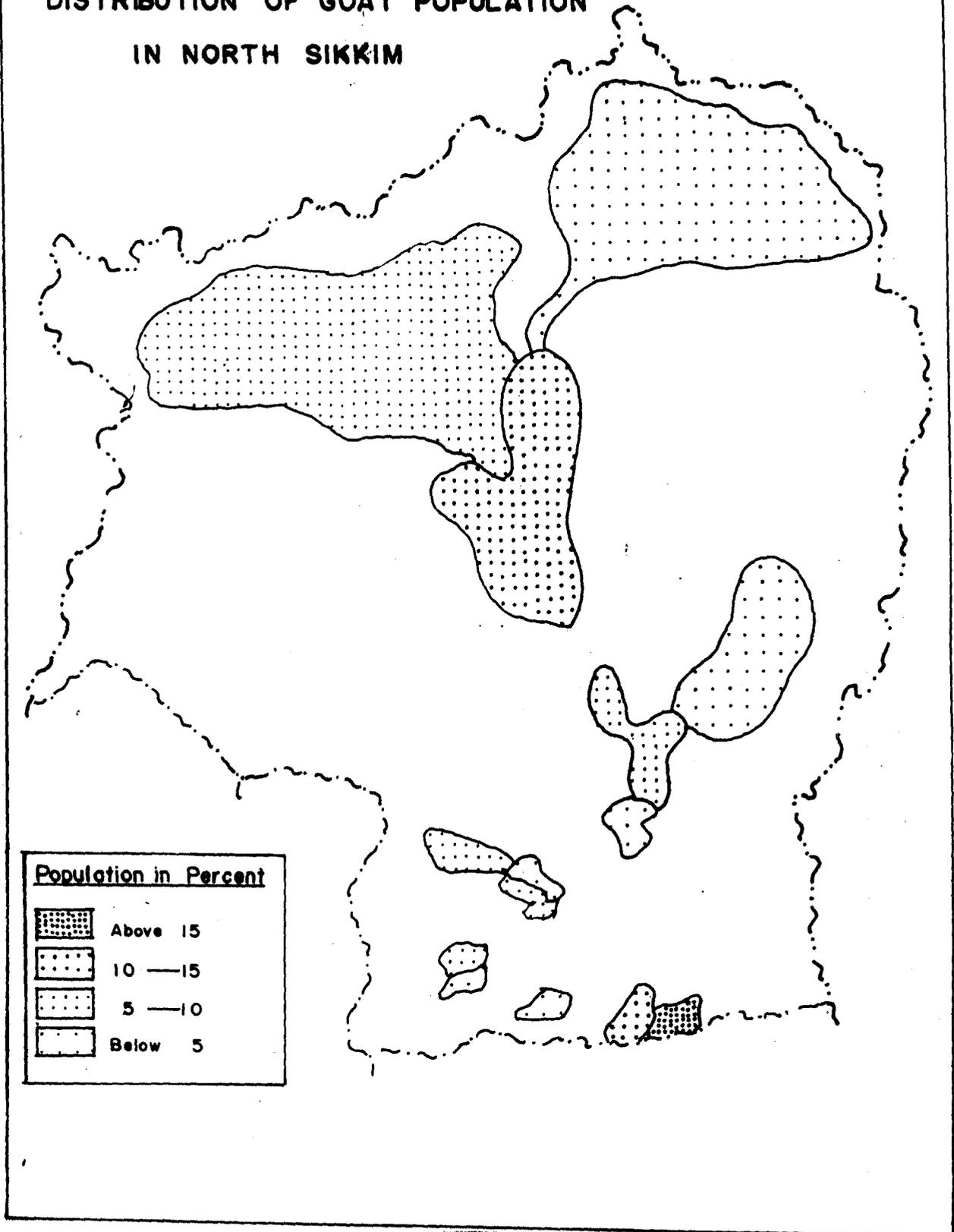


Fig 12.

**Table - 4.7****Distribution of sheep in North Sikkim.**

SI. No.	Percentage Class interval.	Category	No.of villages.	Name of the Villages
1.	Below 9	low	1	Lachung
2	9 -18	Moderate	1	Chho-Lhamo
3.	18 -27	High	1	Lachen
4.	Above 27	very high	1	Lhonak

Thus the above table reveals that sheep rearing appears to be very popular in two villages such as Lachen and Lhonak. Though Lachung and Chho-Lhamo have relatively low sheep population never the less sheep rearing is no less important in these villages. as these animals live in extensive grass lands Lachen and Lhonak have the right ecological conditions. Moreover, better economic conditions of the sheep farmers in these villages have boosted the enterprise of sheep rearing in these villages.

**4.4.1.5. PIGGERY POPULATION**

The distribution of piggery population villagewise in different percentage categories in North Sikkim has been given in table 4.8 and Fig 14.

DISTRIBUTION OF SHEEP POPULATION  
IN NORTH SIKKIM

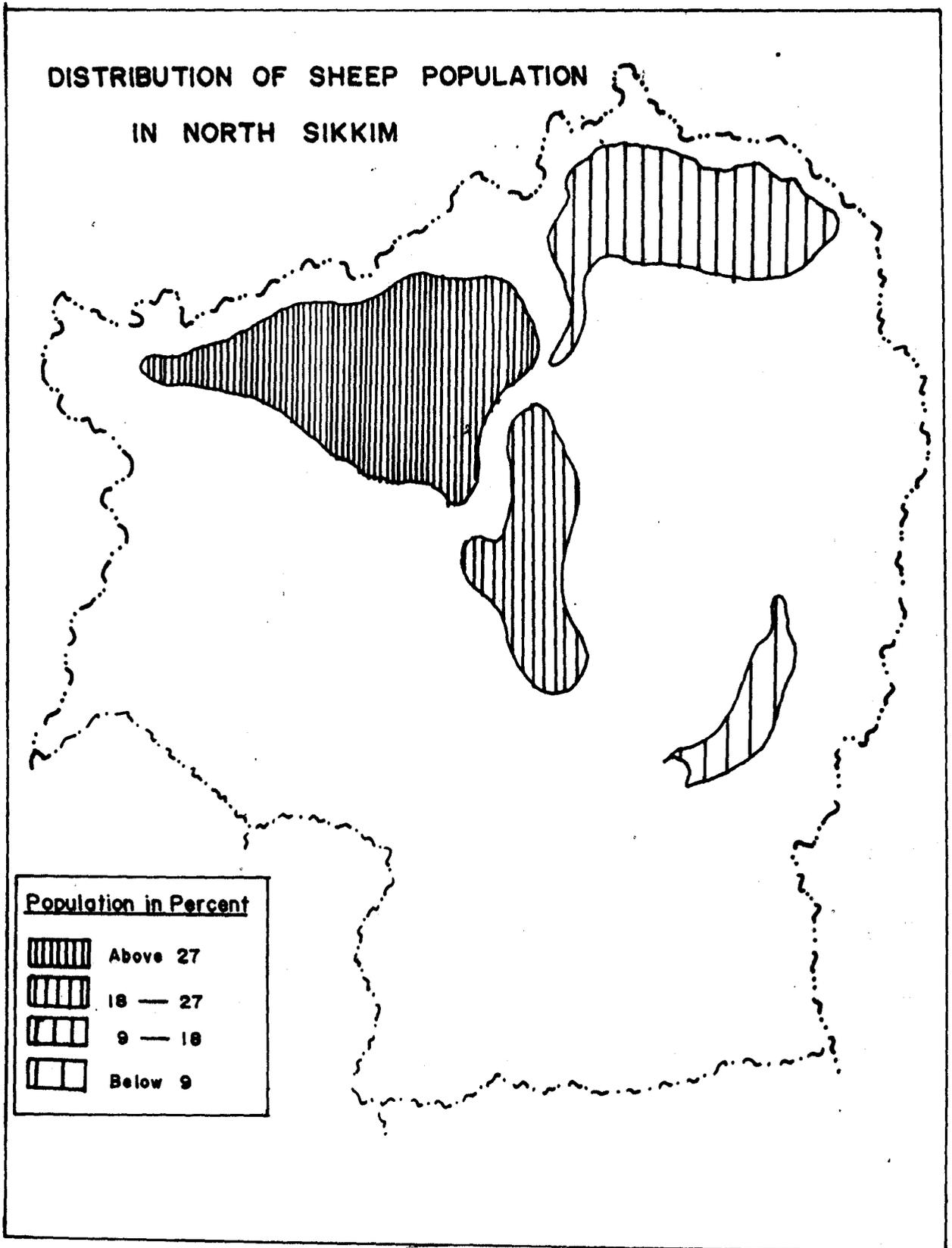
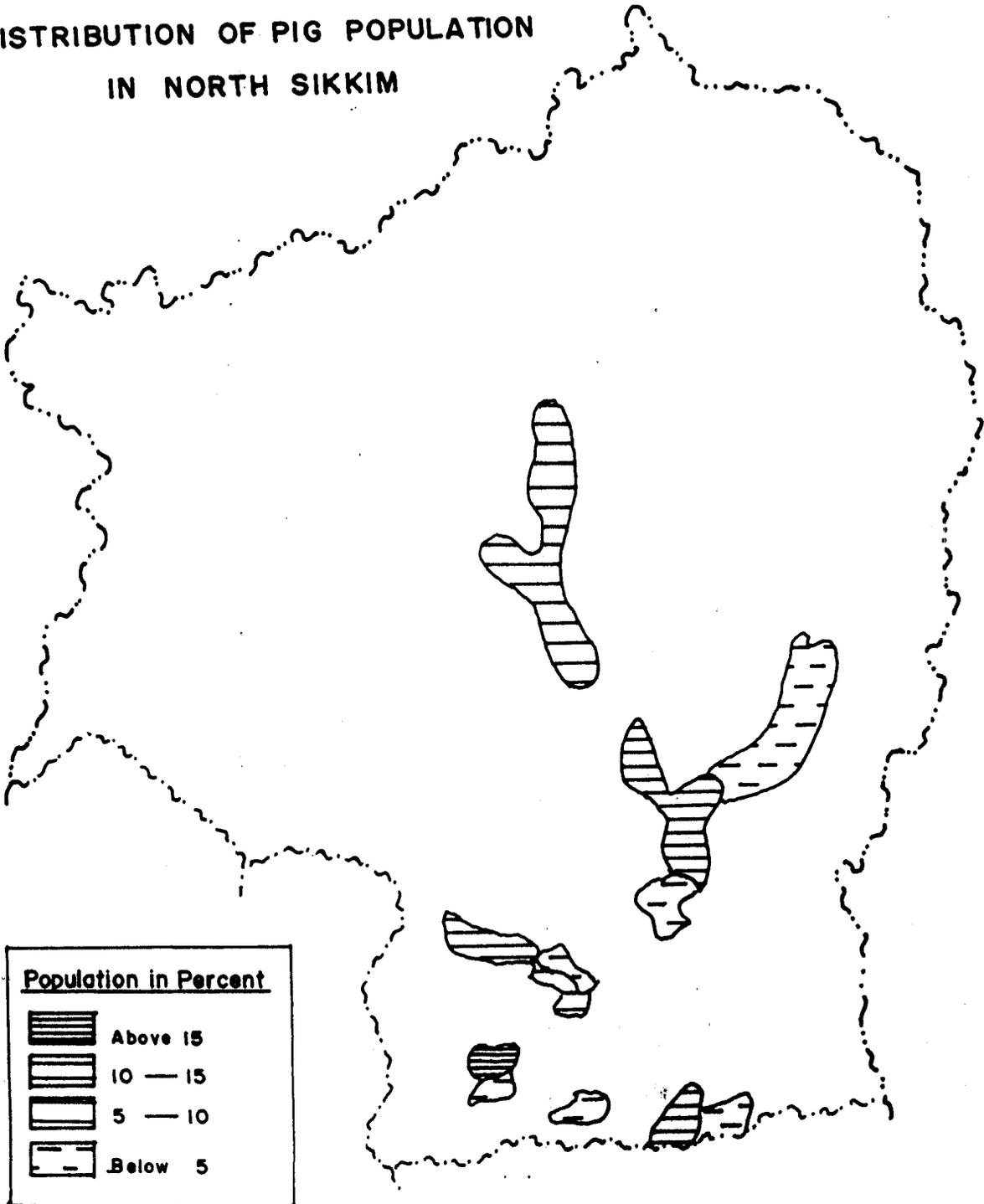


Fig 13.

# DISTRIBUTION OF PIG POPULATION IN NORTH SIKKIM



**Table 4.8**  
**Distribution of Pigs in North Sikkim.**

Sl. No.	Percentage Class interval	Category	No.of villages.	Name of the villages.
1.	0 -5	Very low	8	Lachung, Shipgear, Kazor, Naga Namgor, Pakshep, Gnon-Sandong, Tingda Ramthang.
2.	5 -10	low	3	Lachen, Mangan, Singhik.
3.	10 -15	Moderate	3	Kabi, Lingthem, Chungthang
4.	15 -20	high	1	Hee-Gyathang.

Majority of the sample village accounting for as much as 53 percent of the total sample village have low pig population i.e below 5 percent. There is only one village which has the pig population in the region the percentage share being 15.89 percent come under the category of 15 to 20 percent. There are three villages namely Kabi Lingthen and Chungthang have pig populations that come under the arbitrary percentage class interval ranging between 10 to 15 percent. Similarly there are another three villages namely Mangan, Lachen and Singhik which could be termed as having low piggery population their percentage share varying between 5 to 10 percent. Such low piggery population in these villages may be largely due to harsh environmental conditions and other socio-economic conditions. Similarly, high pig population in Hee-gyathang village could be attributed to suitable geographical conditions required for pig farming and commercial ventures taken up by the farmers.

#### 4.4.1.6. POULTRY POPULATION

The number of villages and various degrees of poultry population in North Sikkim are presented in Table 4.9. The distribution of poultry population in sample villages is shown in Fig 15.

**Table 4.9**

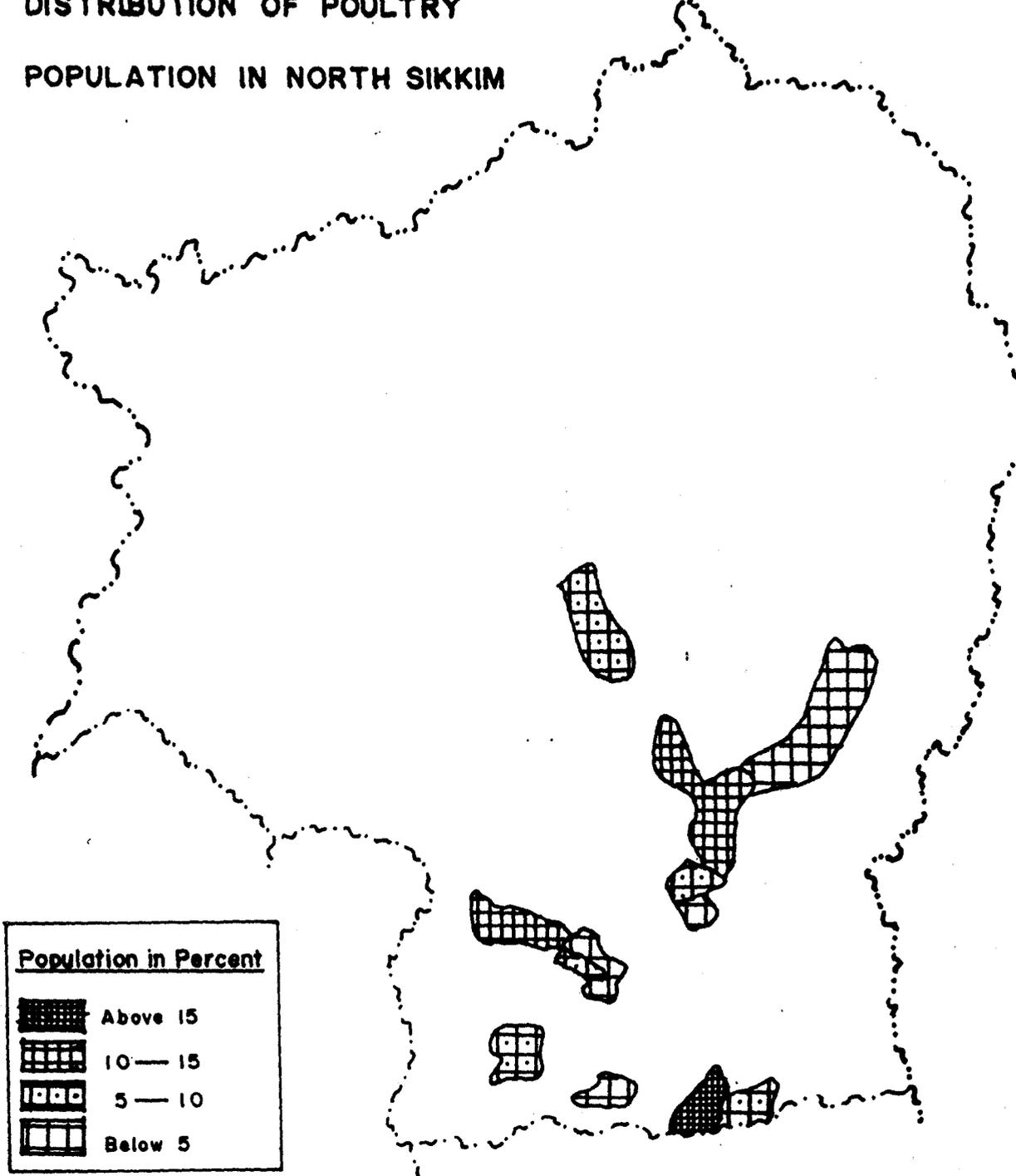
**Distribution of poultry population in North Sikkim.**

Sl. No.	Percentage Class interval	Category	No. of villages.	Name of the villages.
1.	0 -5	Low	6	Lachung, Kazor, Pakshep, Naga Namgor, Ramthang, Mangan.
2.	5 -10	Moderately low	6	Tingda, Gnon-Sandong, Hee-Gyathang, Singhik, Shipgear and Lachen.
3.	10 -15	Moderate	2	Lingthem, Chungthang.
4.	15 -20	high	1	Kabi.

As much as 40 percent of the sample villages have poultry population below 5 percent. Similarly another 40 percent or 6 villages have poultry population ranging between 5 to 10 percent. Only two villages namely Lengthem and Chungthang have poultry population ranging between 10 to 15 percent. Out of 15 villages only one village i.e Kabi has poultry population ranging between 15 to 20 percent which comes under high category of poultry population in the region.

DISTRIBUTION OF POULTRY

POPULATION IN NORTH SIKKIM



Though poultry is a profitable commercial enterprise in North Sikkim atleast 80 percent of the villages surveyed exhibit a very dismal figure of population in terms percentages to the total livestock in the region. The percentage shares of poultry in these villages appear to be below 10 percent of the total livestock in the region. However, only two villages have moderate share of poultry. The high poultry share in Kabi could be largely attributed to profitability of this farming and good incentives given to the farmers.