CHAPTER - I

CATTLE AND BUFFALOES

SYNOPSIS

Introduction ; Meaning-Classification.

Evolution : Background-Domestication-
Domestication of Cattle-Domestication of Buffaloes.

Domestication in India : Cattle and Buffaloes.

Cattle and Buffalo breeds of India and Gujarat:
Species and Breeds-Types of Indian Cattle
Breeds-Cattle Breeds of Gujarat-Types of Indian
Buffalo Breeds-Buffalo Breeds of Gujarat-
Observations.

Introduction

Since early ages, India has been an agricultural
country. Lakhs of her people have been used to live in
thousands of villages scattered all over the country and
agriculture and its allied pursuits have been their main
source of livelihood. For most of them, cattle have been the
part and parcel of their existence and their way of life.
Cattle wealth, its multiplication, its maintenance, its
exchange and other activities, therefore, play a significant
role in (a) improving and strengthening our agrarian
economy, and (b) increasing the pace of progress and
prosperity of our peasant population.
Meaning: In the first Indian Livestock Census of 1919-20 and the subsequent Censuses, livestock covered cattle, buffaloes, sheep, goats, horses and ponies, mules, donkeys, camels, pigs and others. In the category of cattle are covered cows, bulls, bullocks and male and female youngstock. Similarly, in the category of buffaloes are grouped she-buffaloes, buffalo-bulls and male and female youngstock. This categorization of livestock has also been continued in the latest Indian Livestock Census of 1972. Thus, by cattle it is meant cow and its progeny-young male and female calves, bullocks and bulls and by buffaloes it is meant he and she buffalo-calves, buffalo-bulls and she-buffaloes.

Classification: Zoologically, cattle belong to the 'Taurine' group and buffaloes belong to the 'Bubaline' group, both falling under the Genus 'Bos'. Chart 1.1 shows zoological classification of cattle and buffaloes in the abridged form.

The Indian cattle belong to the species 'Bos indicus' (humped cattle) which are also known as the 'Zebu cattle'. The humped cattle are also found in Pakistan, Sri Lanka, China, Malaya, Africa and Phillipines.

The other species of cattle, the 'Bos taurus'

# CHART-1.1

## Zoological Classification of Cattle and Buffaloes

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phylum</td>
<td>Chordata (with vertebra)</td>
</tr>
<tr>
<td>Class</td>
<td>Amphibians, Reptiles, Avions, Mammals</td>
</tr>
<tr>
<td>Sub-class</td>
<td>Prototheria, Metatheria, Eutheria (with placenta)</td>
</tr>
<tr>
<td>Order</td>
<td>Edulata, Sirenia, Cetacea, Ungulata (Hoofed)</td>
</tr>
<tr>
<td>Sub-order</td>
<td>Antidocyle (Even toed)</td>
</tr>
<tr>
<td>Super family</td>
<td>Swina, Tragulina, Tylopatha, Pecura (True ruminants)</td>
</tr>
<tr>
<td>Family</td>
<td>Cervidae, Giraffidae, Antilocapridae, Bovidae (Hollow horned)</td>
</tr>
<tr>
<td>Genus</td>
<td>Bos, Ovidos, Ovis</td>
</tr>
<tr>
<td>Group</td>
<td>Taurine, Bibovine, Bisontine, Bubaline</td>
</tr>
<tr>
<td>Species</td>
<td>Bos taurus, indicus, Bubaline cafier, Bubaline bubalis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Ordinary cattle)</td>
</tr>
<tr>
<td></td>
<td>(Humped cattle)</td>
</tr>
<tr>
<td></td>
<td>(African buffalo)</td>
</tr>
<tr>
<td></td>
<td>(Indian buffalo)</td>
</tr>
</tbody>
</table>

The Indian buffaloes belong to the species 'Bos bubalis' (the Indian buffalo) and the other species is 'Bos cafer' (the African buffalo). The domesticated buffaloes are sub-divided into two categories: (a) the 'River Buffaloes', which are located in India, Pakistan, Bangladesh, Egypt, Iraq, Brazil, the U.S.S.R. and a few East European countries, and (b) the 'Swamp buffaloes', which are found in South-East Asian regions, viz., Phillipines, Thailand, China, Taiwan and Indonesia. They are mostly used for draft purpose in the paddy cultivation and for meat production.

**Evolution**

**Background**: It has not been possible to give the exact time when animal life started and the exact stages of the evolution of various species including man. The earth has been existing for the last 4500 million years and its existence of only last 600 million years can be traced accurately by the geologists. The historians, relying on the archaeological discoveries and

3. The main difference between both these types of buffaloes are found in the length of their legs, the coarseness of their skin and their comparatively under-developed udder.

the written records of ancient civilisations, can read back a mere 6000 years' past.\textsuperscript{5}

According to geologists, mammals have developed in Cainozoic era (known as modern life) which stretches to about 70 million years. This era is marked by evolution of mammals, during which, stage by stage, the ancestors of elephants, the rhinocers, the horse, the pig, the cattle, the tail-less primitive apes, the gibbon-like apes and the man-like apes were originated and developed. It was during last one million years, that marked development of ape-like creatures as a transition to the primitive man took place, and thus, during this period, the modern-age elephants, horses and oxen had first appeared.\textsuperscript{6} It is held that during the last 10 thousand years, the mankind had learnt to domesticate animals and to cultivate plant life. Though the exact period of the domestication of animals by the mankind could not be ascertained, it could be estimated that the domestication began at the end of the Old Stone Age and received decided impetus during the New Stone Age.\textsuperscript{7}

\textbf{Domestication} : Many theories have been propounded to explain domestication of animals by man. Most of these have the basic concept that man needed certain animals and contrived to domesticate them. This explained domestication of animals for religious rites (as sacrifice to the God), for gratifying his

\textsuperscript{5} The Readers* Digest Associations Great World Atlas: 1962: P.112.
\textsuperscript{6} Ibid : p.112.
\textsuperscript{7} Smith V.R. : op.cit.: p.11.
economic needs, viz., meat for food and skin for clothing.\footnote{8}

Another approach in domestication was the role of man as an integral part of his physio-biological environment, e.g. dogs were possibly attracted by the waste of food available around man's environments and slowly became a pet, giving companionship to him.\footnote{9}

As man advanced in his experience in managing animals, he learnt domestication of goats, sheep, cattle, pigs and fowls for economic purposes. Domestication of various animals, which is supposed to have been evolved as stated in the following stages\footnote{10}:

(i) Mammals like dog, reindeer, goat and sheep were domesticated in pre-agricultural period.

(ii) Mammals including cattle, buffalo, gaur, banteng, yak and pig which were originally crop destroyers were domesticated by man and were mainly used for human food.

(iii) Mammals like elephants, horses and camels, asses and onagers were primarily domesticated for transport and labour by agriculturists, nomads and river valley civilization-people respectively.

In support of the above, Mr. Mahanta K.C. believed that the first animal to be domesticated by man was a dog which served as a companion to him in his hunting. He further said

\begin{itemize}
\item 9. Ibid: p.7
\item 10. Ibid: pp.2-3.
\end{itemize}
that animals were then used as beasts of burden. Later on, when man left his nomadic life and started cropping, he used to domesticate animals not only as beasts of burden but also as tools to produce his food, cloths and other products.\textsuperscript{11}

According to Mr. Rice Arthur and others, the primitive man first needed cattle, sheep and goats as a source of his food. Their domestication began when these animals were used by him as the draft animals to assist him in the tillage of the soil.\textsuperscript{12}

**Domestication of Cattle:** The origin of domestic cattle is complex and hidden in the mists of antiquity, though a fragmentary outline can be reconstructed with the aid of fossil, archaeological, anthropological and historical evidence.\textsuperscript{13} It is likely that the centre of origin of Bovidae was the old world tropics or sub-tropics\textsuperscript{14}. The almost universal distribution of wild species of cattle in the temperete, the 'Mediterranean', the sub-tropical climatic zones of the old world, and some areas of the tropics in the Upper Pleistocene period makes it particularly difficult to discover original centre of domestication. Domestication could have occurred at one centre at one time or at different times, or at different centres approximately at the same time.


\textsuperscript{12} Rice Victor Arthur and others: Breeding and Improvement of Farm Animals: 1957 : p.120.


\textsuperscript{14} Ibid : p.31.
Certainly some of the earliest records of the existence of
domestic cattle have been found in the villages of the Nile,
Tigris and Euphrates. Some of the earliest evidences of
domestication have been found at a site of Anan in southern
Turkestan where cattle of the Bos nomadicus type appear to
have been domesticated by approximately 8000 B.C.\textsuperscript{15}

\textbf{Domestication of Buffaloes:} As regards water buffalo, Mr. \textsuperscript{16}
Fahimuddin M. observed that the history of buffalo's
domestication was very imperfectly known, because very little
attention has been given to this aspect of the animal.
However, he stated that, on the bases of (i) archaeological
findings, (ii) the distribution of fossil remains of
pre-historic species in the Narmada Valley and Siwalik Hills
in India, and (iii) the prevalence of its wild species in
India and Indo-Malay Archipalago, the buffalo was
domesticated in India, Indonesia and several other countries
in the Oriental region during pre-historic times between
2500-3000 B.C. from its wild progenitors.\textsuperscript{16}

\textbf{Domestication in India}

\textbf{Cattle:} There has been no unanimity as regards the origin
of cattle in India. While one school of thought holds that
the milking breeds of cattle of northern India were brought

\textsuperscript{15} Ibid : pp. 32-33.
\textsuperscript{16} Fahimuddin M.: Domestic Water Buffalo : 1975 :
pp. 27-28.
by the Aryans with them and that these cattle spread from north-western India to the central and the southern, the western and the eastern regions of India in course of time, the other one believes that the prominent milking breeds of the cattle in India are of indigenous origin. In support of the latter contention, it would be presented that when Vedic Aryans invaded Indus Valley, humpless cattle were existed in large numbers than humped cattle.

Sir Arthur Olver had contended that the grey-white breed, common in northern India, Sind, Bombay (which included Gujarat) and Madras were brought in by the Rigvedic invaders. In support of his contention, he had stated that the present distribution of the white cattle with pigmented skin corresponded fairly closely with the areas reached by the Rigvedic Aryans. He had described about another type of cattle which existed in India from pre-historic times in these words: "All over India, particularly in the Himalayas and the hills of Baluchistan, and in poor forest tracts, a small type of cattle exists which is so definite in colouring, formation and general characteristics that there seems to be little doubt that it is a very ancient type which has existed in India from pre-historic times." Dr. Williamson and Mr. W.J.A. Payne had noted that "... in India, certainly from 3000 B.C.,

there were two types of cattle: (i) a large-horned humped variety, and (ii) a smaller, short-horned type and that there was nothing to indicate how wild, humpless animal developed into domesticated humped one."21

It is stated by Dr. Sunderesan D. that, in India and Mesopotamia, humped cattle were in existence in 4000 B.C.. He further stated that the Mohanjo-Daro seal with a bull known around 2500 B.C. made it almost certain that Indian cattle (Zebu) originated in India.22 Kankrej of Gujarat has close affinity with the Aryan breed of cattle which has been similar to the seal of the Indian Valley civilization.23

Buffaloes: As regards buffaloes, out of four world species, only the Indian buffalo or the Asiatic buffalo—'Bos bubalus bubalis'—has been domesticated mainly in India and Pakistan, while other three are still in wild state.24 According to some writers, remains of a few prehistoric species of buffalo have been found in the gravels of the Narmada Valley and in the Siwalik Hills of the Punjab. 'Bubalus bubalis Arni' was indigenous to India and it is found in wild state in grass jungle of Nepal Tarai, plains of the Ganges and Brahmaputra in Assam. A few heads survive in parts of Orissa, Raipur

22. Dr. Sunderesan D. op.cit.: p.5.
district and southern districts of Madhya Pradesh.\textsuperscript{25}

Indian buffaloes appear with oxen in the mythological literature of India where there is reference to the quality of the milk. According to Mr. Chauhan, 2000 years ago, the domestic buffalo was highly esteemed in South India.\textsuperscript{26}

Mr. Randhawa had stated that: "as long as 5000 years ago, the people of Mohanjo-Daro had one-humped bullock, buffalo, elephant and camel."\textsuperscript{27} He has also referred to the remains of the extinct buffaloes in the valleys of Godawari and the Narmada. Dr. Sunderesan D. has stated that Indian-water buffaloes were confined to India and Sri Lanka. They spread east-ward to Malaya, Japan and China where they have been very successful for cultivation in muddy rice fields. Their movement west-ward had been rather slow. Indian buffaloes were found in Mesopotamia as early as 2500–2100 B.C. as evidenced from inscriptions on a seal. They were found in Jordan Valley in 723 A.D. and are now found in Sicily and Italy.\textsuperscript{28}

Further references are found in our ancient scriptures, religious and mythological writings about the existence of cattle and buffaloes since the pre-historic times. The 'Agni-Purana' contains sections on cattle diseases, the 'Krishi Sangraha' gives rules regarding the construction and

\textsuperscript{26} Ibid: p.548.
\textsuperscript{27} Ibid: p.548.
\textsuperscript{28} Dr. Sunderesan D.: op.cit.: p.5.
sanitation of cow stalls, the keeping and the employment of cattle and description of diseases and the treatment of cattle. The 'Parasar' and the 'Atri Sanhitas' detail the proper uses to which cattle should be put. The 'Sukaniti' gives rules ascertaining the age of bulls from their teeth. The 'Matsya Purana' describes the proper type of bulls for "Brishotsarga" a part of aradh (after-death ceremony) ceremony performed by the Hindus on the death of their parents. References are also available in the 'Kautilya's Arthashastra' written during Chandragupta Maurya, writings of Huientsang-a Chinese visitor, Marco Polo's writings and writings during Moghal period regarding the cattle and the buffaloes.

Cattle and Buffalo Breeds of India and Gujarat

Species and Breeds: While the animal kingdom is divided into species on the basis of both morphological and physiological characters, the most important characteristic distinguishing them from one another is their reproductive discontinuity. Within the species, there are different breeds which can be distinguished.

A breed can be defined as 'a population of animals which differ from those in other population within the same

30. Ibid.: p.56
32. Reproductive discontinuity means two species donot interbred or donot produce fertile progeny when mated to-gether.
species in respect of the definite genetically determined traits. These traits which characterise a breed can be qualitative (e.g. hair type, hair colour, horns) or quantitative (such as size, body type, milk yield, or content of milk). Thus, a breed is a group of individuals having in common a small number of distinguishing qualitative characters and in addition a definite degree of development of some quantitative character or characters. It is also stated that the lines of functional differentiation are not as marked and precise as the differentiation by the simple external characters.

_types of Indian Cattle Breeds:_ India has a large number of cattle and buffaloes and there is great variation in structure and body conformation which results into more breeds. According to Sir Arthur Olver, breed in the strict sense in which this word is used among cattle breeders, rarely exist in India. Almost every district has its so-called breed but the characteristics by which they should be judged have never been defined by any official body and may vary considerably from district to district. He further observed that there were four or five basic types of cattle in India and that a large proportion of so-called breeds are the result of inter-breeding between two or more types. He has attributed such reasons as (i) interchange of cattle owners, (ii) in cattle

by itinerant traders, (iii) migration in search of grazing, and (iv) indiscriminate and uncontrolled breeding to the mixed breeds in India.\(^{35}\) Even with the mixed breeds, there were perhaps all the breeds, each having typical characters and distinctive features.

Sir Arthur Olver classified, in 1938, Indian Cattle into the following six breed categories:\(^{36}\)

(I) The long-horned cattle of Mysore;

(II) The Gir type cattle of Kathiawar;

(III) The large white type cattle of the north, which was sub-divided into:

(a) broad-faced grey-white type of north, and

(b) narrow-faced cattle of the north;

(IV) The Montgomery or the Sahiwal type;

(V) The Dhani type; and

(VI) The Hill type.

Prof. S.C. Das Gupta has classified various breeds of Indian cattle into the following groups:\(^{37}\)

(I) Long-horned Mysore Type. It covered Amrit Mahal, Hallikar, Kangayam, Khillari, Krishna Valley, Bargur and Alambadi breeds.

(II) Long-eared Gir type of the forest of Kathiawar. It included Gir, Deoni, Dangi, Mehwati and Nimari breeds.

\(^{35}\) Ibid.: p.1

\(^{36}\) Das Gupta S.C.: op.cit. pp. 117-120.

\(^{37}\) Ibid.: pp. 121-129.
(III) Broad-faced, lyre-horned, large, grey, white type of the north. It comprised Kankrej, Malvi, Nagore, Tharparkar, Bachaur and Ponwar breeds.

(III-B) Narrow-faced, white, short-horned type of northern and central India. It covered Bhagnari, Gaolao, Hariana, Hansi, Ongole and Rath breeds.

(III A-B) Mixed type. This included Kanwari and Kherigadh breeds.

(IV) Sahiwal type-mixture of Afghan northern Indian blood. It included Sahiwal breed of Montgomery and Red Sindhi breed (which is mixture of Sahiwal and Gir).

(V) Dhani breed of Frontier Province.

(VI) Hill-type of ancient India. It included Siri breed of Darjeeling and Lohani breed of Sind and Baluchistan.

ICAR-New Delhi has classified Indian cattle on the basis of their utility as follows:

(a) Milch Breeds, (b) Draft Breeds, and (c) Dual Breeds.

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38. Milch Breeds include cattle which are good producers of milk but the draft capacity of bullocks is poor.

39. Draft Breeds include cattle whose draft capacity is better, i.e. bullocks are good and powerful workers and cows are low or poor producers of milk.

40. Dual Breeds—also known as general utility breeds—are cattle which are fair milkers as well as bullocks are good workers. In countries where cattle are raised for milk and meat—as against milk and work in India—dual purpose refers to milk and meat production.
ICAR has described 26 Indian cattle breeds on their physical features, qualitative and quantitative characters.41

Cattle Breeds of Gujarat: Gujarat possesses the Gir, the Kankrej and the Dangi cattle breeds (vide photographs 1.1 to 1.5) (whose characteristics are presented in Table 1.1) in addition to the mixed and non-descript breeds. These breeds are thickly populated in specified areas as could be seen in Map 1.1. Gir breed is found in Saurashtra area, Kankrej breed in Kutch and north Gujarat areas, Mixed Kankrej in central Gujarat area and Mixed Breeds in border areas near Rajasthan, Madya Pradesh, and Maharashtra states. The exact proportion of each breed in the total cattle population cannot be reliably ascertained as the data are not collected breed-wise and as the recognition of breed needs some


Milch Breeds: (1) Gir; (2) Sahiwal; (3) Red Sindhi; (4) Deoni.

Draft Breeds: (1) Nagore; (2) Bachaur; (3) Kenkantha; (4) Malvi; (5) Kherigadh; (6) Hallikar; (7) Amrit Mahal; (8) Khillari; (9) Bargur; (10) Kangayam; (11) Ponwar; (12) Siri.

Dual Breeds/General Utility Breeds:

(1) Nimari; (2) Dangi; (3) Haryana; (4) Mewati; (5) Rath; (6) Ongole; (7) Gaolaco; (8) Krishna Valley; (9) Tharparkar; (10) Kankrej.
technical knowledge and experience on the part of the enumerators. The census data of the livestock are collected quinquennially by the village panchayat secretaries, village talatis or village school teachers who hardly possess technical knowledge of different breeds. However, according to the Sample Survey conducted by the Animal Husbandry Department to estimate milk production of Gujarat during 1970-71, the proportion of various breeds of milch cows in the state during 1958-59, 1963-64 and 1970-71 were as per the figures given in Table 1.2.

Table 1.2

<table>
<thead>
<tr>
<th>Breeds</th>
<th>Percentage of milch cows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gir</td>
<td>27 : 38 : 30</td>
</tr>
<tr>
<td>Kankrej</td>
<td>20 : 8 : 33</td>
</tr>
<tr>
<td>Desi or non-descript</td>
<td>50 : 53 : 37</td>
</tr>
<tr>
<td>Others</td>
<td>3 : 1 : -</td>
</tr>
<tr>
<td>Total</td>
<td>100 : 100 : 100</td>
</tr>
</tbody>
</table>

Types of Indian Buffalo Breeds: In India buffaloes are mainly reared for milk production and are rarely used for draft purpose.

A large number of buffaloes in India do not have clear description and specific breeds. Mr. I.L. Mason observed that "Most of the buffaloes of the subcontinent are breedless, non-descript, unimproved or desi. Presumably desi buffaloes differ from region to region but no descriptions are available." According to Mr. G. Williamson and Mr. W. J. A. Payne, only in India, well-defined tropical breeds with standard qualities are found but well-bred individuals are far out-numbered by non-descript animals.

While describing the Indian buffalo breeds, Mr. I. L. Mason has classified them in such groups as (i) Murrah group covering Murrah, Nili-Ravi and Kundi, (ii) Gujarat Breeds including Surti, Mehsana and Jafarabadi, (iii) Uttar Pradesh Breeds comprising Bhadwari and Tarai, (iv) Central Indian Varieties covering Nagpuri, Pandharpuri, Manda, Jeragi, Kalahandi, Sambalpur, and (v) South Indian buffaloes are Toda and South Kanara.

ICAR has given breed description to seven buffalo breeds of India, viz., the Murrah, the Bhadwari, the Jafarabadi, the Surti, the Mehsana, the Nagpuri or Ellichpuri and the Nili or Ravi.

Buffalo Breeds of Gujarat: Gujarat possesses three buffalo breeds, viz., the Jafarabadi, the Surti and the Mehsani (vide photographs 2.1 to 2.4) as also desi and descriptors.

46. Mason I.L.: op.cit.: p.14
47. CSIR, New Delhi: op.cit.: p.10.
non-descripts. The three buffalo breeds are thickly populated in the specified areas of Gujarat as could be seen from Map 1.2. Surti is mainly found in central Gujarat area, Jafarabadi in Saurashtra area and Mehsani in Ahmedabad and north Gujarat areas and Mixed Breed in the Panchmahals and Valsad districts areas. Table 1.3 gives proportions of various buffalo breeds in Gujarat over different years. In Table 1.4 are given important characteristics of three buffalo breeds of Gujarat.

<table>
<thead>
<tr>
<th>Breeds</th>
<th>Percentage of milch buffaloes</th>
<th>1958-59</th>
<th>1963-64</th>
<th>1970-71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surti</td>
<td></td>
<td>31</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Jafarabadi</td>
<td></td>
<td>12</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>Mehsana</td>
<td></td>
<td>14</td>
<td>9</td>
<td>42</td>
</tr>
<tr>
<td>Desi or non-descript</td>
<td></td>
<td>36</td>
<td>47</td>
<td>21</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>7</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Observations:

(1) Gujarat forms a part of the western region having excellent cattle breeds in our country. It has 'Gir' as one of the four milch breeds of India. This breed responds very well in milk production when it is well managed. It has very

48. The Department of Animal Husbandry, Gujarat State considers buffaloes of Kutch district area belonging to a distinct breed viz., 'Banni'. The breed name has been given after a popular garzing and breeding area in Kutch named Banni. Breed description of this breed are however not defined and specified.

49. GOG : op. cit.: p.18.
good milk production potentiality. Bullocks are willing workers and are useful for heavy work. While commenting on the Gir breed in 1939, Mr. Kothawala, Imperial Dairy Expert had stated thus: "Perhaps the oldest breed of cattle in India which has played a prominent part in the origin of some of the important Indian breeds of cattle found today. A typical dual purpose breed which was in great demand all through the country at one time, but now very nearly exhausted due to want of controlled breeding." 51 In the list of the factors that contributed to the rapid spread of this breed in other parts of the country are included (i) its high milk-yielding capacity, (ii) good quality of bullocks, and (iii) continuous movement of the breed in search of grazing from one part to the other with their owners— the maldharis.

(2) Gujarat possesses one of the best dual breeds of India, viz., Kankrej. This breed (particularly the bullocks) is fine and beautiful in appearance. Bullocks are very popular amongst agriculturists all over Gujarat for their fast and powerful work. Cows have proved to be good milkers in recent years. There is mention about this cattle of Gujarat in Ain-i-Akabari, the popular writings of the Akabar's time, which mentioned that though every part of the empire produced cattle of various kinds, those of Gujarat were the best, that sometimes a pair of them were sold at 100 muburs, that they would travel 80 kos (120 miles) in 24 hours, and that they surpassed even swift horses. It further recorded that

they did not dung whilst running, that their usual price was between 10 and 20 muhurs. This breed is exported to U.S.A. and Brazil to increase beef production in their breeds. This breed is known in America as 'Brahman' breed.

(3) Dangi breed is good draft cattle. Bullocks are willing workers and are fit for heavy rainfall areas and suitable for work in the mountainous tract of Dangs of south Gujarat.

(4) Mixed and non-descript breeds are usually found in the border areas of the State (vide Map 1.1). Exchanges of these breeds take place between one State and the other on their borderlines.

(5) The age-old need of bullocks for carrying out agricultural operations and the need for transportation has resulted in evolving in them the draft capacity. Thus, milk production has been a neglected aspect of cattle breeding in India and Gujarat.

(6) Gujarat is also fortunate in having three out of seven well defined Indian breeds of buffaloes. Buffaloes are the main suppliers of milk and ghee to the people. Now, buffalo milk is being supplied to the developing dairy industry. High fat percentage, higher milk production, suitability of stall-feeding, and subsisting on inferior fodder bestow superiority upon buffaloes over all the common milch animals. Mehsana, Surti, and to some extent, Jafarabadi buffaloes are

52. Ibid. : p.59.
in great demand by Bombay buffalo-keepers to meet the demand for milk of Bombay.

(7) More proportion of cattle and buffalo breeds of Gujarat represent physical and functional characters true to their breeds when compared with all-India breeds.

(8) The Maldharis, the Rabaris, the Bharwads, other nomadic people and the tribals are mainly responsible for preserving purity in breeds of cattle and buffaloes in Gujarat by their careful maintenance and management. This can be testified in the words of the Royal Commission on Agriculture as follows: "If enquiry were to be made into the history of such breeds as..........the Kankrej of Gujarat, the Gir of Kathiawad..........we believe it would be found, in most cases, that their excellence is due to the care bestowed on them by the professional cattle breeders, usually nomadic, who were formerly common in India, but who are abandoning grazing as the result of spread of cultivation.......... They were the only members of the rural population who paid attention to breeding, and understood the management of cattle; they usually worked under unfavourable conditions, but their skill in selection and tending cattle was so considerable that they were able to show good herds." 53