

The Ecological Basis of the Geographical Distribution of the Dhangars: A Pastoral Caste-Cluster of Maharashtra

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ABSTRACT This paper attempts to elucidate how the topography, climate, vegetation and other biological and human factors have moulded the distribution of the various Dhangar castes of Maharashtra, India, in general and that of the Gavli Dhangars of Peninsular India in particular. It is concluded that the distribution of each of the Dhangar castes is primarily determined by the suitability of a region for the sustenance of an animal either directly maintained by that group or whose products form the basis of the subsistence of that group.

INTRODUCTION

The Dhangar caste-cluster, with an estimated population of 2 million (7 per cent of the state's population), comprises of 23 endogamous castes of the state of Maharashtra in western India. This cluster includes castes which are buffalo, cattle, sheep, horse and goat keeping pastorals, weavers of cotton and sheep wool and meat sellers. They are distributed in the state of Maharashtra between 22° to 16°N latitudes and 73° to 80°E longitudes (Malhotra, '79a). Some of the Dhangar populations have in more recent times migrated into the southern state of Karnataka from 13°30' to 16°N latitudes and 74° to 76°E longitudes (Gadgil and Malhotra, '79).

The present investigation attempts to elucidate how the topography, climate, vegetation and other biological and human factors have moulded the distribution of the various Dhangar castes in general and that of the Gavli Dhangar caste in particular.

MATERIALS AND METHODS

The materials reported in this paper have been collected over a 10 year period from 1969

to 1979 as part of three research projects. A major investigation of the entire Dhangar caste-cluster of Maharashtra, led by KCM, was carried out jointly by Deccan College, Pune, and Indian Statistical Institute, Calcutta, from 1969 to 1974. This involved visit to selected *tahsils* of every district (there are 26 districts) of Maharashtra followed by extensive interviews of over 4000 Dhangar households. A detailed ecological study of the Gavli Dhangars (one of the 23 Dhangar castes) of Haliyal Tahsil in the North Kanara district of Karnataka, led by MG, involving 57 settlements was conducted from the Indian Institute of Science, Bangalore. Further investigations of 10 Gavli settlements in Maharashtra were jointly carried out by us in April-May 1979.

DISCUSSION

The Dhangar Caste-Cluster

The Dhangars constitute one of the caste-clusters of the Hindu caste society. Each one of the Hindu castes is an endogamous group with all marriages being confined to within the caste. Each caste follows a traditional occupation which even now tends to be retained

by most members of the caste. Each caste is distributed over a well defined region and tends to be a self governing social unit (Karve, '61).

The Indian subcontinent harbours an estimated over 3000 such castes and the state of Maharashtra in which the Dhangar caste-cluster is distributed has around 300 endogamous castes (Malhotra, '79b). These castes are hierarchically organized, based on ritual criterion into five *varnas*, namely Brahmin (priest), Kshatriya (warriors), Vaishyas (traders), Shudras (cultivators, pastorals and artisans) and Panchama (menial workers, considered 'untouchables' in historical times). The Dhangar caste-cluster is assigned to the fourth, i.e. Shudra *varna* (Ghurye, '57).

As the name implies Dhangars (*Dhana*—livestock) are a group associated with animal husbandry. Traditionally all these castes were either animal herders, weavers of wool as well as of cotton and meat-sellers. Table 1 gives details of names, estimated population size, occupation and traditional occupation of the 23 Dhangar castes.

In terms of traditional occupation, of the 23 Dhangar castes, 10 castes, namely, Ahir,

Gadhari-Nikhar, Halmat, Khutekar, Kurmar-Unnikankan, Mendhe, Shegar, Telangi, Unnikankan and Zade herded sheep and wove woollen blankets; Ladshe and Varhades herded sheep but wove cotton blankets; Sangars only wove woollen blankets; Khatiks sold sheep and goat meat; Thellaris herded both sheep and cattle, Gavlis (also known as Mhaske, Dange) kept buffaloes; and 7 remaining castes, namely, Gadhari Dhengar, Hande, Hatkar (in Sangli district the Hatkars also maintain cattle), Hattikankan, Kannade, Kurmar-Hattikankan and Zende reared only sheep.

In respect of numerical strength the Dhangar castes depict wide diversity — there are 9 castes numbering upto 10,000; 8 others number between 10,000 and 50,000; 2 castes number between 50,000 and 100,000; and there are four castes numbering over 100,000.

Ecological Base

The aim of the present paper is to test the hypothesis that the distribution of each of these castes is primarily determined by the suitability of a region for the sustenance of the animal either directly maintained by that

TABLE 1

Population size, distribution, language and traditional occupation of the Dhangar castes in Maharashtra

Dhangar castes	Estimated population ¹	Mother tongue	Distribution in districts	Traditional occupation
Ahir	300000	Marathi	A'Nagar, Akola, Amraoti, Aurangabad, Buldhana, Dhulia, Jalgaon, Nasik	Sheep-keeping and wool-weaving
Dange	100000	do	Kolaba, Kolhapur, Pune, Ratnagiri, Sangli, Satara	Buffalo-keeping
Gadhari-Dhengar	20000	Hindi	Akola, Amraoti, Aurangabad, Dhulia, Jalgaon	Sheep-keeping
Gadhari-Nikhar	5000	do	Akola, Amraoti, Aurangabad, Dhulia, Jalgaon	Sheep-keeping and wool-weaving
Halmat	8000	Kannada	Kolhapur, Sangli	Sheep-keeping and wool-weaving
Hande	4000	do	Sangli, Sholapur	Sheep-keeping
Hatkar	573000	Marathi	Ahmednagar, Akola, Amraoti, Aurangabad, Bhir, Buldhana, Dhulia, Jalgaon, Kolhapur, Nanded, Nasik, Osmanabad, Parbhani, Pune, Sangli, Satara, Sholapur, Wardha, Yeotmal	Sheep-keeping ²

Continued

TABLE 1—Continued

Hattikankan	5000	do	Bhir, Nanded, Osmanabad, Sholapur	Sheep-keeping
Kannade	15000	do	Bhandara, Chanda, Nagpur, Wardha	Sheep-keeping
Khatik	15000	do	Ahmednagar, Aurangabad, Bhir, Bombay, Kolaba, Nasik, Pune, Satara, Sholapur, Thana	Meat-sellers
Khutekar	550000	do	Ahmednagar, Akola, Amraoti, Aurangabad, Bhir, Buldhana, Jalgaon, Kolaba, Nagpur, Nanded, Nasik, Osmanabad, Parbhani, Pune, Ratnagiri, Satara, Sholapur, Wardha, Yeotmal	Sheep-keeping and wool-weaving
Kurmar-Hattikankan	15000	Kannada	Bhandara, Chanda	Sheep-keeping
Kurmar-Unnikankan	5000	do	Bhandara, Chanda	Sheep-keeping and wool-weaving
Ladhse	6000	Marathi	Amraoti, Bhandara	Sheep-keeping and cotton-weaving
Mendhe	30000	do	Kolhapur, Pune, Sangli, Satara, Sholapur	Sheep-keeping and wool-weaving
Sangar	10000	do	Ahmednagar, Bhir, Kolhapur, Pune, Ratnagiri, Sangli, Satara, Sholapur	Wool-weaving
Shegar	40000	do	Ahmednagar, Aurangabad, Bhir, Osmanabad, Pune, Sholapur	Sheep-keeping and wool-weaving
Telangi	5000	Telgu	Nanded,	Sheep keeping and wool-weaving
Thellari	7000	Marathi	Dhulia, Jalgaon, Nasik	Sheep and cattle keeping
Unnikankan	6000	do	Osmanabad, Sholapur	Sheep-keeping and wool-weaving
Varhade	150000	do	Akola, Amraoti, Bhandara, Chanda, Nagpur, Wardha, Yeotmal	Sheep-keeping and cotton-weaving
Zade	15000	do	Chanda, Nagpur, Wardha, Yeotmal	Sheep-keeping and wool-weaving
Zende	80000	Marathi	Kolhapur, Sholapur	Sheep and horse-keeping
Total	1964000			

1. The population estimates for these castes are based on figures provided mostly by the leaders of these castes. The cases where the population sizes are less than 20000 the estimates are highly reliable (over 95%); most of these castes have their own associations or societies and they could provide reliable figures. But in the case of castes numbering over 100000, the estimates may not always be reliable.

2. Part of the Hatkars in Sangli district, locally known as Khellaris, have traditionally also kept substantial number of cattle together with the sheep.

group or whose products form the basis of the subsistence of that group. The group of cotton weavers (all of whom also keep sheep), which must have derived from an earlier tradition of wool weaving, is expected to be distributed over the region suitable for growing cotton. The proposed hypothesis can be tested at a gross level with respect to all the Dhangar castes and in much greater detail for the Gavli Dhangars.

The five animals maintained by some caste or the other of the Dhangars are the water buffalo, the cattle, the sheep, the horse and the goat.

Buffalo. The buffalo (*Bubalus bubalis*) is a close relative of the Asiatic wild buffalo (*Bubalus arni*) which still survives as a wild animal in parts of central and northeast India. Where they co-occur, the wild and the domestic buffalo readily interbreed. The optimal habitat for the wild buffalo is the riverine and the swamp forest. The domestic buffalo equally shares this love for water and is best maintained in tracts where water and shade are abundantly available (Cockrill, '74). It is therefore most suited for areas of good rainfall and forest cover where the forest canopy has been a little opened up providing good grass and bamboo growth on the forest floor. The buffalo is also the only domestic animal capable of defending itself against predators like the panther and the tiger which used to abound in the forested tracts.

In Maharashtra buffalo can therefore be sustained in large numbers only in forested tracts in the high rainfall zone. In the past it could also have been maintained in large numbers in the more arid tracts where rivers supported a good gallery forest (Gadgil and Malhotra, '79).

Cattle. The cattle (*Bos indicus*) is a smaller animal compared to the buffalo and is less dependent on shade and water, and in fact cannot tolerate very slushy conditions. Archaeological evidence shows that wild cattle once occurred in good numbers on the Deccan plateau in the deciduous forest zone (Allchin, '63a). The cattle cannot however tolerate extreme lack of shade and aridity and are therefore best maintained in the moderate rainfall tract which has retained some cover.

Sheep. The domestic sheep probably originated from the central or west Asiatic wild sheep whose natural habitat is rather arid grass lands (Zeuner, '63). The domestic sheep can therefore tolerate a complete lack of shade and scarcity of water but can not survive under

slushy conditions. The semiarid tracts of Maharashtra with a rainfall of 800 mm. or less per year therefore afford optimum habitat for the sheep.

Horse. The horses originated on the Central Asiatic steppes and have traditionally been a pack and riding animal for the pastoral nomads. Its optimum habitat is the grass land although it cannot tolerate extremes of heat and water to the same levels as sheep.

Goat. The goat is a most versatile animal with a relatively wide range of tolerances. Unlike the other animals, which primarily graze on grass, the goats browse on foliage of shrubs and trees. They can tackle the thorniest of plants with milky latex. The optimum habitat for goat is therefore a degraded forest vegetation which has given way to scrub.

Cotton. Cotton is cultivated best in the zone of 700-1000 mm. of rainfall on medium and deep black soils (Pellusterts, Chromusterts). These conditions are obtained in central and eastern Maharashtra to the east of the semiarid tract (National Atlas Organization, '77).

Maharashtra — The Setting

The state of Maharashtra forms a triangular wedge with a shore line of the length of 825 kms. forming the base of this region. A narrow coastal strip of 50-80 km. width is bordered by the hill chain of the Western Ghats which rise abruptly from the coastal plain to an altitude of 1000-1500 meters. The Western Ghats run parallel north-south to the coast. The hills of the Western Ghats pass through a series of hills extending over a belt of 60 km. into the Deccan plateau at average altitude of 500-600 meters. The precipitation, confined to the four months of monsoon from June-September, is heaviest on the west coast and the Western Ghats everywhere exceeding 2500 mm. It decreases rapidly to the east of the crest of the Ghats reaching level of less than 600 ~~meters~~ ^{mm} in a semi-arid belt which at its broadest is 150 km. in width. The rainfall again increases to the east of this semi-arid tract and ranges between 800-1200 ~~meters~~ ^{mm} in the eastern half of the state.

The climax vegetation of Maharashtra would have ranged from dry deciduous and scrub forest in the semi-arid tract to the ever-green forest on the crest of the Western Ghats. This vegetation has however been drastically changed by human activities. Figure 1 gives details of the rainfall distribution and the present day vegetation of Maharashtra.

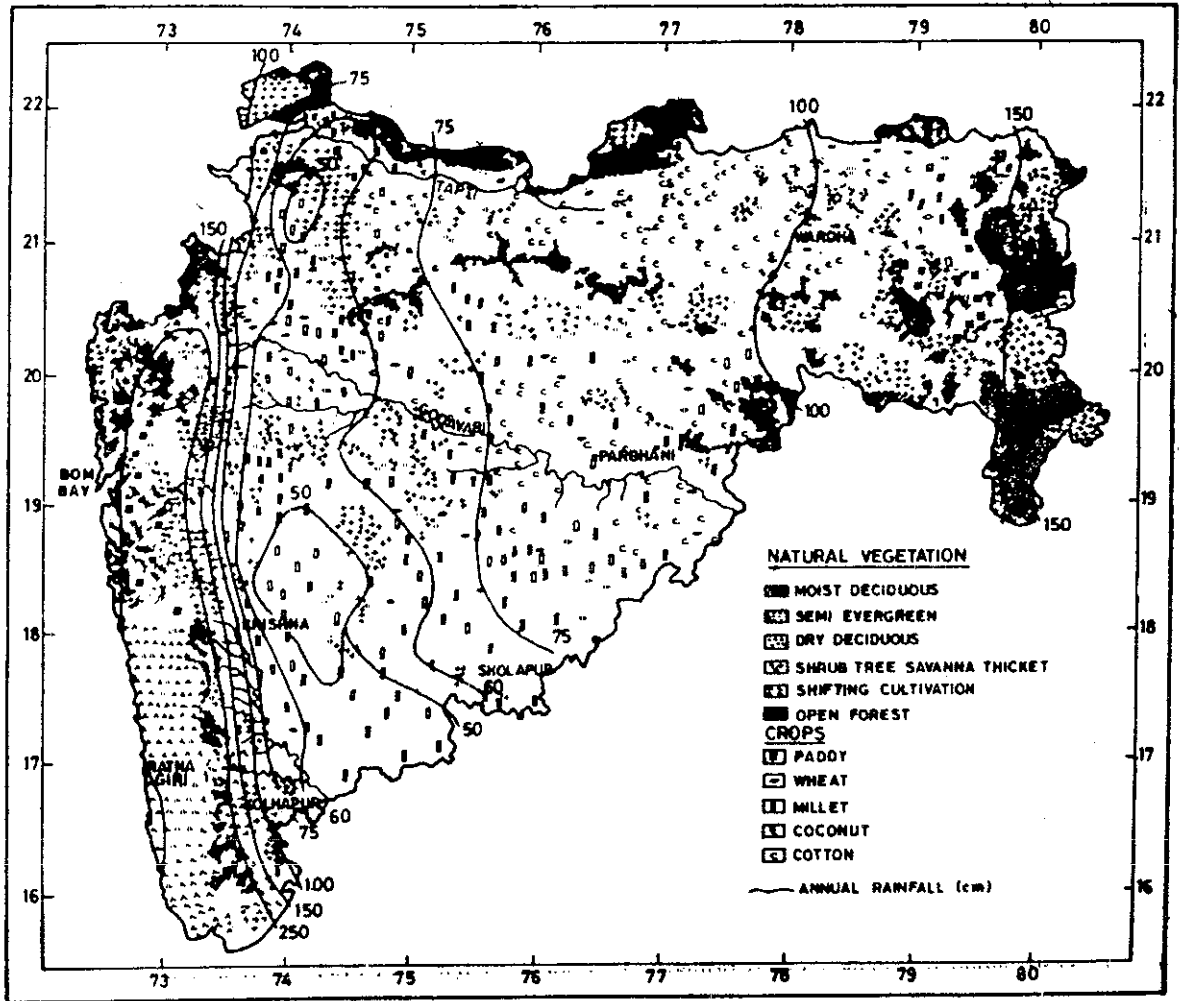


Fig. 1 Rainfall distribution and present day vegetation of Maharashtra

Geographical Distribution of Dhangar Castes

An examination of Table 1, in light of requirements listed above of the domestic animals and of cotton, and the dependence of the various castes on them, shows that the distribution of various castes is governed in fact by the needs of the animals and plants on which they depend. This is brought out further in figure 2, which shows the distribution over Maharashtra of castes primarily dependent on buffalo, cattle, sheep, weaving of sheep wool and weaving of cotton. The buffalo herders are restricted to the high rainfall tracts of west coast and Western Ghats. The other possible buffalo habitat, namely the gallery forest along the river tracts has disappeared several centuries ago. The cattle keeping Thellaris and part of the Hatkars are restricted to deciduous

forest zones of Kolhapur-Sangli and Dhulia districts. These are the only two areas in Maharashtra where considerable extent of deciduous forest of the moderate rainfall zone still remains intact. Everywhere else the land which was earlier under deciduous forest has been brought under plough. The cultivators of these tracts do keep cattle in small numbers. However, there is no large contiguous area suitable for grazing by the herds of cattle primarily kept by the pastoral caste in these zones except in the three districts noted above.

The optimum habitat for the sheep is the open semi-arid tract of central Maharashtra. Only the river valleys of this region can sustain agriculture on a long term basis and there are vast tracts of uncultivated land available for grazing sheep in this zone. The sheep keeping Dhangar castes are largely concentrated in this

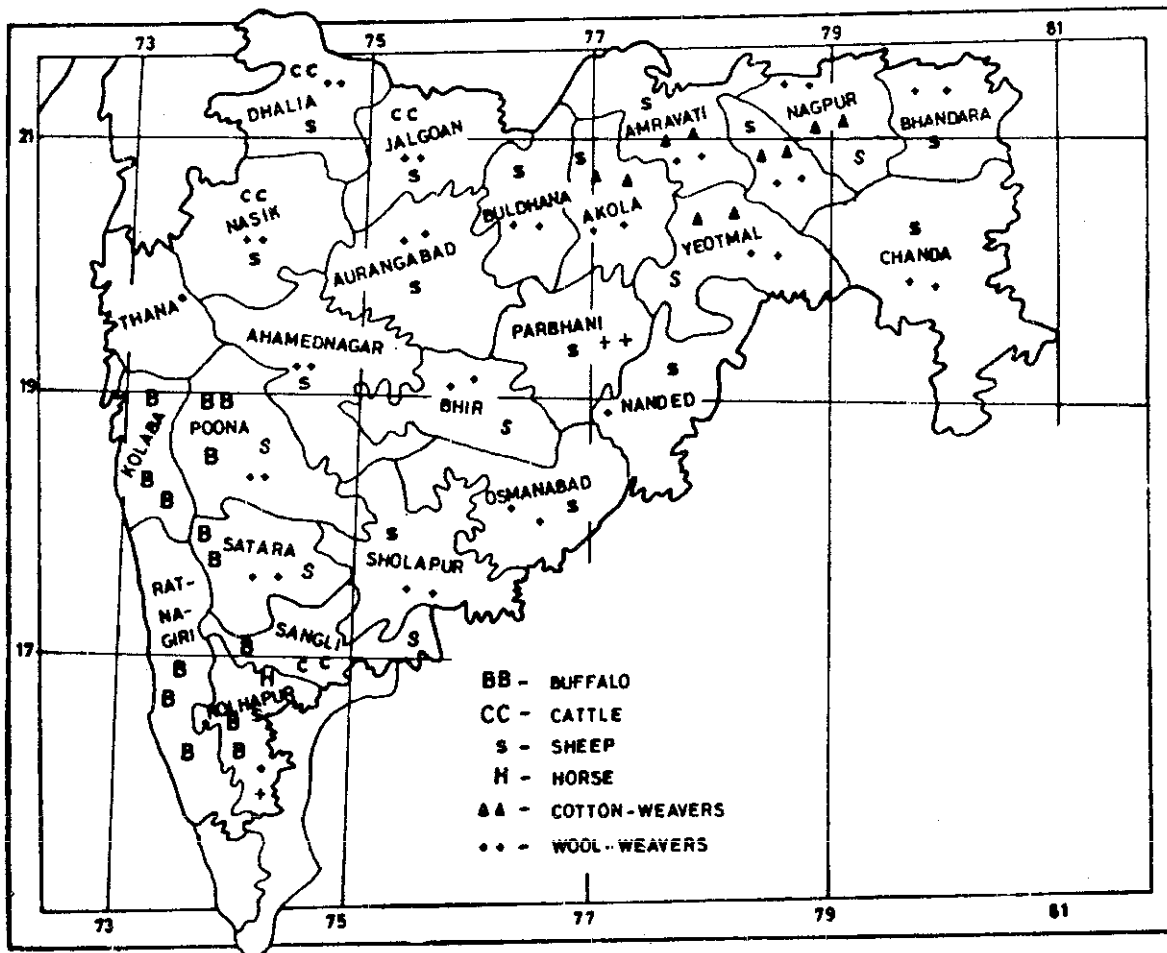


Fig. 2 Distribution of Dhangar castes primarily dependent on buffalo, cattle, sheep, weaving of wool and weaving of cotton

tract. There is only a sprinkling of primarily sheep-keeping Dhangars in eastern Maharashtra; they largely depend on the uncultivable terrain of this region. An inspection of figure 3 will reveal the densities of sheep population (1961 Census, Livestock) which clearly establishes this fact. It may be noted here that traditionally only Dhangar caste, maintained sheep. In recent years, however, a rather negligible number of sheep are also maintained by other castes. We therefore, except that the sheep distribution, in general, will correspond with the distribution of sheep-keeping Dhangar castes. In fact this is so, as seen from figure 4, wherein are shown population densities of Dhangars in Maharashtra as per 1901 census. A joint inspection of figs. 3 and 4 further shows that the districts which show high concentration of sheep population also show high densities of Dhangars.

Many of these shepherd castes do maintain horses as pack animals. There is however one traditionally sheep-keeping caste known as Zende Dhangars which bred horses largely for the army. The rather restricted distribution of this horse breeding caste to just a small part of the shepherd range in Sangli — Kolhapur districts is notably intriguing. Part of this tract is rather hilly and as noted above it retains some deciduous forest cover. It is possible that since the horses cannot tolerate as much aridity as sheep, so this may have been a part of the shepherd range particularly suitable for horse breeding. It is also possible that the patronage of some local rulers may have played a role in encouraging this particular shepherd caste to take up to horse breeding.

It is notable that the weaving of wool is entirely restricted to the castes within the

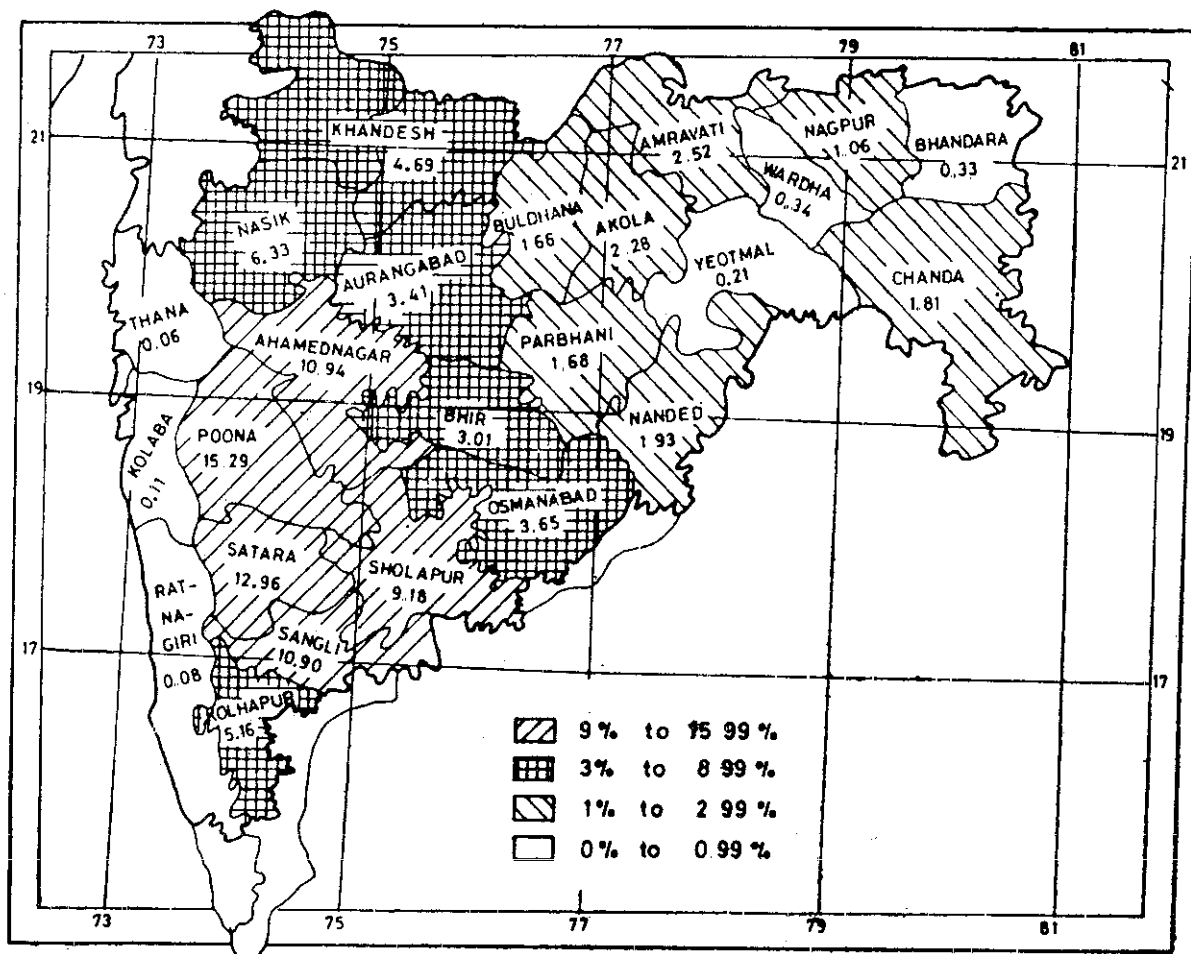


Fig. 3 Distribution of sheep population densities in Maharashtra (Census, 1961)

Dhangar caste-cluster. The wool-weaving castes predominantly occur in the western half of the range of sheep-keeping castes, except for the Kurmars. This concentration of wool-weaving castes to the west appears highly associated to the fact that the market for woollen blankets, their sole product, is largely in the heavy rainfall tracts of the west coast and the Western Ghats which lies entirely to the west of the range of shepherds. Interestingly enough, the two sheep-keeping Dhangar castes of eastern Maharashtra market their sheep-wool but purchase cotton and weave cotton blankets using the same technique as that employed in weaving woollen blankets. Their distribution overlaps the range where cotton is most extensively grown and is the region where there is a better market for cotton rather than woollen blankets. The cotton weaving by the Dhangar castes is restricted to

the use of their traditional skill of weaving blankets. Many other castes outside the Dhangar caste-cluster employ much more sophisticated techniques of cotton weaving including the very fine weaving of cotton saris.

Gavli Distribution

The Gavlis, primarily a buffalo-keeping caste, are distributed over the forested hill tracts of the Western Ghats from 19°N to 13°30'N latitudes covering 11 districts and 47 tahsils of three states of Maharashtra, Goa and Karnataka (figure 5). Today this entire tract is free of malaria. The northern limit of their distribution near Panvel coincides with the beginning of the still somewhat malarious forest of Thana district which also harbours a large component of tribal population. Till recent times the southern limit of the Gavli

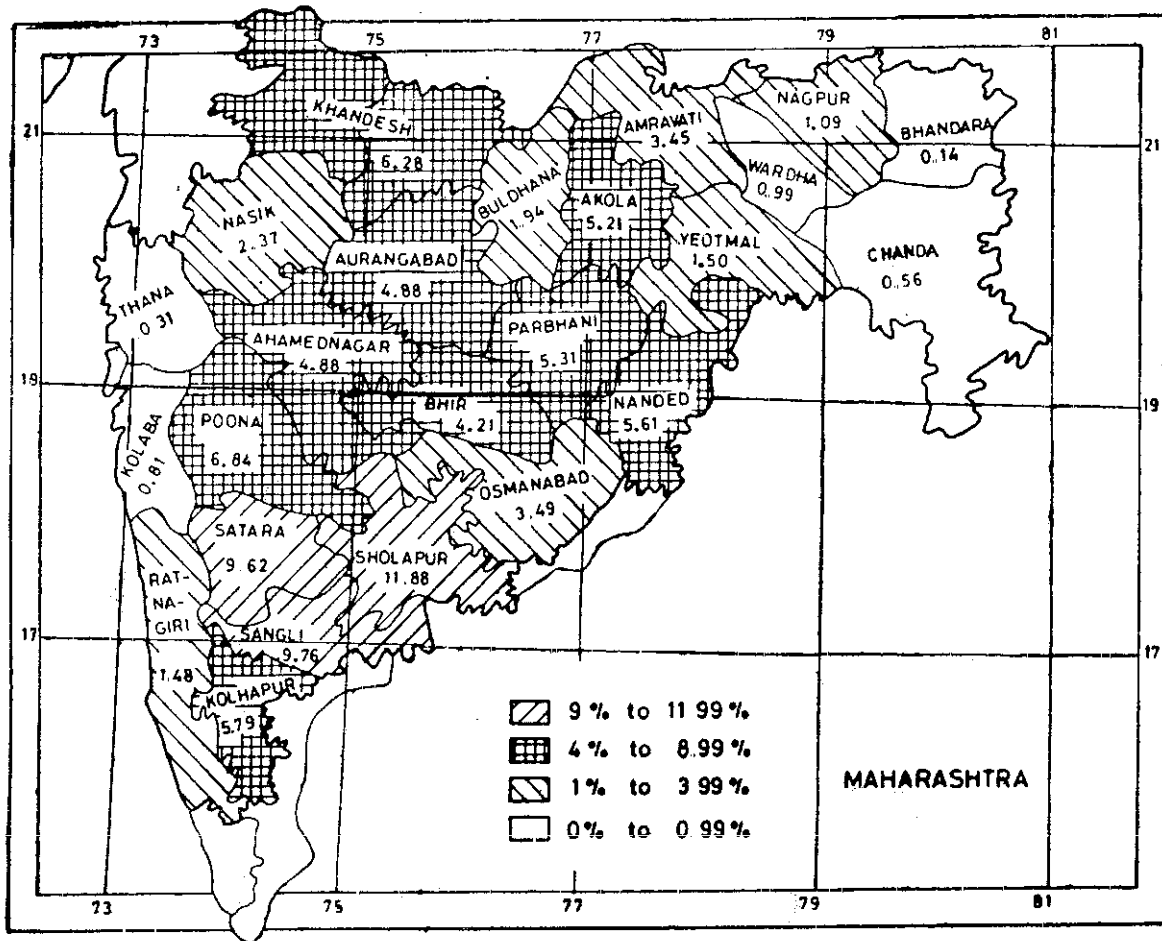
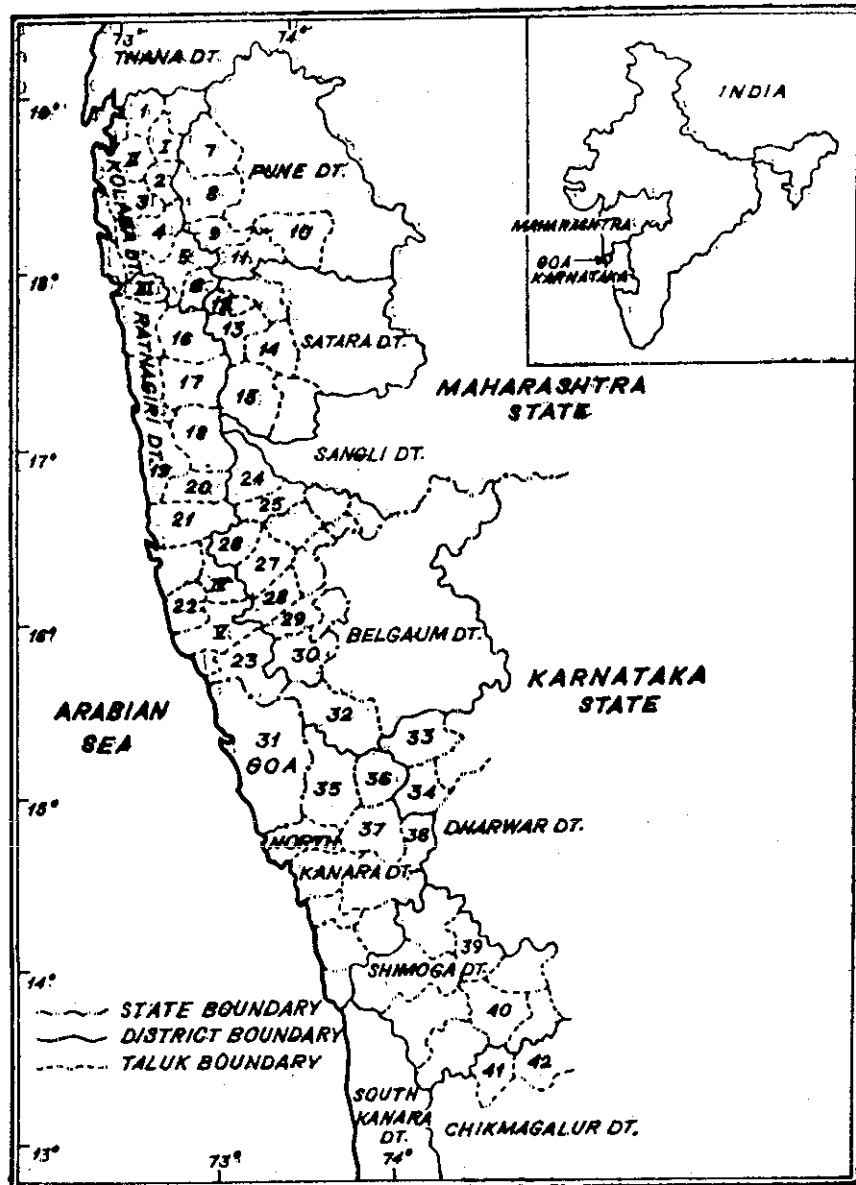


Fig. 4 Distribution of Dhangar population densities in Maharashtra (Census, 1901)

distribution lay at 16°N near Sawantwadi. This was the northern limit of the forested tracts of Karnataka Western Ghats which were highly malarious till 1949. Interestingly enough Gavlis have migrated into this tract which was striking in its lack of any tribal populations in large numbers soon after the control of malaria in 1949. Gavlis themselves lack any genetic defence against malaria (Undevia et al., '73) and their distribution seems to have been regulated by the incidence of this disease (Vishwanathan, '50; Gadgil and Malhotra, '79).

In Maharashtra, Gavlis are restricted to the rainfall zone of 2000 to 6000 mm. while in Karnataka they are in the rainfall zone of 800-2500 mm. The dry deciduous forest in the rainfall limit of 800-1500 mm. offers the best habitat for buffalo and cattle under climax conditions. The moist deciduous forest in the rainfall zone of 1500-2500 mm. with an

opened up canopy has excellent grass and bamboo growth, and infact constitutes an optimum habitat for buffalo and cattle. The tree growth on the Karnataka Western Ghats which were highly malarious till 1949 has been largely preserved except for the extraction of larger trees and the slight opening of the canopy which has created ideal conditions for the Gavli animals in the deciduous forest zone of 800 to 2500 mm. rainfall. The Karnataka Gavli populations are largely restricted to this zone. The semi-evergreen and evergreen forests in the rainfall zone of more than 2500 mm. have completely bare forest floor under climax conditions and cannot support good populations of buffalo and cattle. Wherever this canopy has been opened up in Karnataka area, the forest floor has been invaded by a composite weed called *Eupatorium odoratum* which is completely unpalatable to the animals. Forests of semi-evergreen and evergreen type



Kolaba district

1. Pánvel
2. Sudhagad
3. Roha
4. Mangaon
5. Mahad
6. Poladpur

Pune district

7. Mawal
8. Muslhi
9. Velhe
10. Purandhar
11. Bhor

Satara district

12. Mahabaleshwar
13. Jaoli
14. Satara
15. Patan

Ratnagiri district

16. Khed
17. Chiplun
18. Sangameshwar
19. Ratnagiri
10. Lanja
21. Rajapur
22. Malvan
23. Savantwadi

Kolhapur district

24. Shahuwadi
25. Panhala
26. Bavda
27. Radhanagri
28. Bhudargad
29. Ajara
30. Chandgad

Goa

31. Goa

Belgaum district

32. Khanapur

Dharwar district

33. Dharwar
34. Kalghatgi

North Kanara district

35. Supa
36. Haliyal
37. Yellapur
38. Mundgod

Shimoga district

39. Shikarpur
40. Shimoga

Chikmagalur district

41. N. R. Pura
42. Tarikere

Besides these 42 tahsils it is most likely that Gavli Dhangars are also found in (i) Khalapur and (ii) Pen tahsils of Kolaba district, (iii) Mandangad, (iv) Kanakvli and (v) Kudal tahsils of Ratnagiri district.

Fig. 5 Distribution of Gavli Dhangars in peninsular India.

in the rainfall zone of more than 2500 mm. in Karnataka have therefore not been colonized by the Gavlis.

In Maharashtra, on the other hand, the tree growth in the deciduous forest zone of less than 2000 mm. of rainfall has been almost totally destroyed. With its short rainy season of four months and with its Deccan trap rocks offering very good drainage this zone is now very dry and cannot sustain any large livestock populations outside of the four months of monsoon. No Gavli settlement therefore occur in this zone in Maharashtra. The tree growth has been considerably destroyed in Maharashtra even in the higher rainfall tracts. These tracts, however, do support considerable growth of shrubs, some trees and some perennial water sources. In addition, this rainfall zone in Maharashtra has not yet been invaded by the weed *Eupatorium odoratum* which has been strongly spreading in the higher rainfall tracts of Western Ghats starting from its southern extremity over the last two decades. This high rainfall zone is therefore the region colonized by the Gavlis in Maharashtra all the way to the highest rainfall tracts of Mahabaleshwar, with a rainfall of over 6000 mm. a year. The practice of shifting cultivation may have played an important role in opening up forest canopy and inducing excellent grazing for Gavli animals in this high rainfall zone in the earlier times when the forest was much better preserved.

The present southern limit of the Gavli distribution at 13°30'N latitude in the Chikamglur district of Karnataka corresponds to a change in topography of the Western Ghats. The Western Ghats rise much more precipitously in this region to an altitude of 1800 meters or so. The forest that is retained is on the narrow crest line of the hills and is of the evergreen type. In this region there are no broad tracts of deciduous forest available for colonization by the Gavlis for a distance of 100 km. or so. The deciduous forests which could constitute good Gavli habitat are available further to the south only in the Mysore district. The Gavlis who have extensively colonized Karnataka only in the last 30 years have not crossed over to this tract.

Within the present range of distribution the overall strength of the animal herds of the Gavlis and its composition is strongly influenced by the condition of tree growth in their habitat. The total biomass of the animals decreases with a destruction of the tree growth primarily because the animals are

heavily dependent on browsing in the dry season. The composition of the herd changes from being dominated by the buffaloes to cattle and to goat with a degradation of the tree growth. This is because the buffaloes are least tolerant to the scarcity of brows, shade and water in the dry season and because goat is the only animal which can survive in the totally degraded scrub which results from a complete destruction of tree growth in this high rainfall tract (Gadgil and Malhotra, '79).

Historical Developments

The carrying capacity of any tract of land for a given species of animal is a function of the vegetation on that tract of land. The evergreen and semi-evergreen forests in the high rainfall zone have very low carrying capacity for any domestic herbivores because of the lack of grass growth on the forest floor under the complete canopy. The deciduous and thorn forest is an excellent habitat for domestic herbivores under the climax condition. Archaeological evidence seems to suggest that the earliest domestication of animals began with the maintenance of cattle in the semi-arid tracts, then under deciduous and thorn forests around 1500 B.C. (Allchin, '63b). A destruction of tree cover in this region gradually converted it into a treeless grass land habitat primarily suitable for sheep. This region is also the present strong hold of the sheep keepers. Cattle and buffalo keeping must have then shifted to the deciduous forests of moderate rainfall zone where cattle keeping now persists in a few pockets. The rest of the forest zone has been taken over for cultivation by the farmers who keep a small number of cattle primarily as draft animals. The buffalo-keeping pastorals were thus gradually forced to the high rainfall forested tracts of Western Ghats to which they are now restricted.

The last century has seen a very rapid and progressive decimation of the tree cover over most of Maharashtra. This along with overgrazing has drastically reduced the carrying capacity of the land for animal herds of the pastorals. The total amount of land available for grazing their animals has also shrunk with extension of cultivation by the rest of the population. Many pastoral groups therefore can no longer sustain themselves on their traditional animal husbandry. Consequently, the overall animal herds of the pastorals have dwindled, and goat, the animal most adapted

to degraded vegetation has become a more and more important component of their animal herds. The pastorals have also increasingly taken to cultivation and have become semi-sedentary and fully sedentary. Since sheep-keeping particularly depends on the ability to move and take advantage of a rotational circuit of grazing, this has further reduced the ability of the pastorals to maintain their animals. The only new resource that has become available to the pastorals has been the increased demand by the farmers of lands under canal irrigation for sheep manure. This has opened up to the pastorals new source of income as well as grazing of the stubble after the harvest. This has, however, only marginal implications in terms of improving the grazing for the animals. The weavers used to enjoy a good market for their woollen and cotton blankets. However, mechanization of the weaving industry has implied a loss of demand for blankets of weavers from the more affluent section of the society. At the same time the impoverishment of the bulk of the rural population has reduced its purchasing power and thereby reduced its demand for the blankets of the weavers. Many of the weavers have therefore abandoned their traditional occupation.

The overall picture is one of an increasingly larger number of pastorals and weavers of Dhangar castes being forced to give up their traditional profession and take to cultivation of land or occupation open to unskilled labour. Since traditionally nomadic pastorals had not established right over land, most of them are now being forced to cultivate small tracts of marginal lands. As a result, except for a small fraction of Dhangars who have been able to establish land holdings under irrigation, the bulk of them have definitely experienced a substantial lowering in the quality of their life over the last century.

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REFERENCES CITED

- Allchin, F. R. 1963a. *Neolithic Cattle Keepers of South India: a Study of the Deccan Ashmounds*. Cambridge University Press: Cambridge.
- Allchin, F. R. 1963b. Cattle and economy in neolithic South India. In A. E. Mourant and F. E. Zeuner (eds.), *Man and Cattle: Proceedings of a Symposium on Domestication*. pp. 149-155. Robert Maclehorse & Co. Ltd: Glasgow.
- Cockrill, W. R. 1974. *The Husbandry and Health of the Domestic Buffalo*. F.A.O.: Rome.
- Gadgil, M. and K. C. Malhotra 1979. Ecology of a pastoral caste: the Gavli Dhangars of Peninsular India. *Technical Report No. Anthropol./3/1979*, Indian Statistical Institute: Calcutta.
- Ghurye, G. S. 1957. *Caste and Class in India*. Popular Prakashan: Bombay.
- Karve, I. 1961. *Hindu Society: An Interpretation*. Deccan College: Poona.
- Malhotra, K. C. 1979a. Natural selection and colourblindness: fresh data on Indian castes. *Genet. Research (Camb.)*, 31: 203-207.
- 1979b. Excommunication as a process leading to the formation of new groups. *The Eastern Anthropologists*, 32: 49-53.
- National Atlas of India 1977. Department of Science and Technology, Government of India: Calcutta.
- Undevia, J. V., K. C. Malhotra and F. Dudhwalla 1973. G-6-PD deficiency and abnormal haemoglobin among the Dhangars of Maharashtra. *Proceedings 28th Annual Conference of Indian Physicians*, Udaipur, Abstract No. 41.
- Vishwanathan, D. K. 1950. *Malaria and its Control in Bombay State*. Chittrashala Press: Poona.
- Zeuner, F. E. 1963. The history of the domestication of cattle. In A. E. Mourant and F. E. Zeuner (eds.), *Man and Cattle: Proceedings of a Symposium on Domestication*. pp. 9-19. Robert Maclehorse & Co. Ltd: Glasgow.

