CHAPTER II

AGRICULTURAL SET UP

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   c) Cultivable waste land

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6. Summary

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The role of physical and economic elements in agriculture has been discussed in the preceeding chapter. However, it is obvious to analyse the agricultural aspects which influence the landuse pattern and the adoption of tractor. It includes a study of landuse pattern, size of landholdings, irrigation, cropping pattern and agricultural implements.

1. Landuse pattern :

Land resources play a strategic role in determining economic, social and cultural progress. There are various factors such as physical, demographic and economic which influence the landuse pattern. The general landuse pattern of Kolhapur district reveals that out of the total geographical area about 17.92% land is under forest cover in 1977-80 as against 18.92% in the year 1960-63. Area not available for cultivation is 8.5% which has remained almost unchanged. About 9.9% of the total area was under waste land and another 6.8% was devoted to permanent pastures in 1960-63. The percentage has been reduced to 8.03 and 5.62 respectively in 1977-80. The area sown more than once has shown increase in hectarage during last two decades. The proportion of land under cultivation has also recorded this increase during last two decades.

a) Area under forest

The district has 17.92% of the area under forest as compared to state average of 17.31%. The proportion of area under

Table 2.1 Tahsilwise percentage distribution of land according to different uses,(1977-80).

Sr. No.	Tahsil	Percentage of land under different uses to total area of the tahsil							
		Total Geographical area	Area under forest	Not available for cultivation	Waste land (cultivable)	Permanent pastures	Fallow land	Net sown area	Gross cropped area
1.	Karveer	8.2	1.1	10.3	5.6	7.8	5.8	71.13	73.80
2.	Panhala	6.9	20.6	8.7	3.2	6.3	7.6	53.50	53.70
3.	Hatkangale	7.5	1.2	8.1	1.4	10.1	2.5	76.50	80.60
4.	Shirol	6.2	1.8	7.5	3.7	2.2	1.6	83.20	91.10
5.	Kagal	6.7	2.7	7.9	1.1	4.0	4.7	76.80	78.00
6.	Gadhinglaj	5.9	3.7	4.9	1.0	2.3	2.5	85.40	87.10
7.	Chandgad	11.8	26.6	4.9	8.5	1.6	13.3	45.40	45.70
8.	Ajara	6.7	26.9	6.7	1.5	5.8	7.4	52.40	53.30
9.	Bhudargad	7.8	37.3	6.9	4.6	2.6	7.4	39.90	40.70
10.	Radhanagari	10.4	31.2	12.2	11.9	6.6	4.6	33.90	34.90
11.	Gaganbavada	8.9	17.80	12.1	30.3	1.4	19.5	19.08	19.10
12.	Shahuwadi	12.2	23.4	12.9	11.9	11.8	9.5	30.85	32.50
	District	2.7	17.92	8.94	8.0	5.6	7.5	51.93	53.50

Source : Director of Agriculture, M.S., Pune.

forests varies between 1.1% in Karveer tahsil to 37.3% in Bhudargad tahsil. The western six tahsils of the district have above 20% of the total geographical area under forest cover each. Incase of the eastern three tahsils viz. Karveer, Hatkangale, Shirol, the percentage of area under forest is less than 2% each.

b) Land not available for cultivation

The percentage of land not available for cultivation (8.55%) is slightly more than that of Maharashtra state (5.76%). Within the district the percentage as barren, and uncultivable land is more in the western hilly parts. Shahuwadi tahsil has 12.93% land not available for cultivation. It is followed by Gaganbavada, Radhanagari, Panhala, Karveer tahsils. The main reasons for this are the poor lateritic soils and rocky slopes of the hill and rough terrain. Incase of Karveer tahsil due to urbanization and higher density of population more land is put to non agricultural uses.

c) Cultivable waste land

8% of the total area of the district is under cultivable waste. The percentage of cultivable waste land is as high as (30.26%) in Gaganbavada tahsil followed by 11.9 and 11.8 in Radhanagari and Shahuwadi tahsils respectively. The western hilly tahsils have high percentage of cultivable waste land. The contour bunding is necessary for bringing it under cultivation. The less proportion of cultivable waste land is observed in Hatkangale and Kagal tahsils in the east.

d) Land under permanent pastures

The percentage of pasture land is more in Shahuwadi tahsil i.e. 11.6% followed by Hatkangale (10.1%) and Karveer (7.7%) tahsil.

e) Fallow land

The proportion of fallow lamd is highest in Gaganbavada tahsil i.e. 19.5 % followed by Chandgad and Shahuwadi tahsils 13.3% and 9.5% respectively. The less area under fallow is observed in central and eastern part.

f) Net sown area

The proportion of net sown area in Kolhapur district is 51.89%. The district has less percentage of net sown area due to the fact that, Kolhapur district has got high percentage of waste land and other fallow lands, The proportion of net sown area is very low in western hilly tahsils.

The western part of the region is relatively backward in agriculture due to rough terrain and poor quality of soils. The percentage of cultivated land is high in the eastern tahsils of the district due to fertile soils and plain topography drained by river Panchanganga.

2. Size of land holdings

The extent of land availability to a holder determines the extent to which its exploitation is possible. Table 2.3

indicates the number of operation holdings and area operated by size class of operational holdings in Kolhapur district are revealed by the agricultural census conducted in 1976-77 (figures in the brackets show percentages).

Table 2.2 Number of operational holdings and average size of class.

Sr. No.	Size Class	Total holdings		Average size of holdings (in hect.)
		Number	Area in hect.	
1.	below 0.5 hect.	1,01,494(33.56)	24,038(4.47)	0.23
2.	0.5 to 1.0 "	57,549(19.03)	41,006(7.63)	0.71
3.	1.0 to 2.0 "	62,474(20.66)	90,574(16.86)	1.44
4.	2.0 to 3.0 "	31,526(10.42)	75,824(14.10)	2.40
5.	3.0 to 4.0 "	17,127(5.66)	58,830(10.95)	3.43
6.	4.0 to 5.0 "	10,479(3.46)	46,195(8.59)	4.40
7.	5.0 to 7.5 "	12,292(4.06)	74,529(13.87)	6.06
8.	7.5 to 10.0 "	4,433(1.46)	37,789(7.03)	8.52
9.	above 10.0 "	5,005(1.62)	87,462(16.28)	17.47

Source : Report on Agricultural census, 1976-77.

The table 2.2 reveals that the percentage of marginal holdings i.e. having land upto one hectare is 52.59% in Kolhapur district. The percentage of small farmers i.e. having land

between 1 to 2 hect. is 20.66%. Thus it is observed that in all 70% holders are either marginal or small farmers in the district, and hold only 28.96% operational area. Kolhapur district stands second in the state having a very high percentage of small and marginal farms.

3. Irrigation :

Irrigation is essential for crop cultivation and better yield, especially in areas where rainfall is uncertain. Farming without irrigation is very limited and if the rainfall decreases to less than 300 mm agriculture is impossible without irrigation (King,1953). In the peninsular India, where agriculture is a perpetual gamble with the monsoon, irrigation acts as a protective and stabilising factor as well as a productive input (Pawar,1981). Irrigation is one of the important inputs and socio-economic basis of agriculture. The success of agriculture depends to a large extent on how successfully water requirements of various crops can be met (Arora,1976). Availability of perennial water for irrigation encourages farmers to adopt more scientific techniques and intensive cultivation.

Irrigation helps to augment yield per unit area and increase the cropped land through the transformation of agriculture and increasing production of agriculture offers new opportunities of employment to the people, "Due to irrigation farmers can make additional investment in cattle, farm implements

and more valuable crops like.sugarcane and labours",(Gadgil, 1945), obviously, it increases the land value and leads to additional use of land. The performance of particular mode of irrigation (well, canal, tank, lift etc.) depends largely on physiographic and climatic conditions of a region. It is, therefore, necessary to make use of scare resources in the bes possible manner, wherever they are available.

A. Sources of irrigation :

The types of irrigation, based on sources of water are largely affected by the physical features, viz. topography, geology, soil and presence of ground water etc. The region has two sources of irrigation; lift irrigation and well irrigation with dominancy of individuals in particular parts of the regio

a) Lift irrigation

Lift irrigation schemes are provided to lift up water from the surface flow of nala, river, canal etc., for irrigati the lands situated at high level (Pawar,1981). The source of irrigation should be perennial to have a successful and self sufficient schemes. Before the advent of water pumps, farmers used to make full use of river water by means of 'Budhaki moat It is a shallow hole dug in the bed of a river or stream. In this system there are three or five Budhakies usually four and the total lift is generally of 16 M (Patil,1950). Now adays this system is declining due to the introduction of oil engine

Table 2.3 Area irrigated by different sources (area in hect.).

Tahsil	1960 - 1963						1977 - 1980					
	Canals	Tanks	Wells	Lifts	Net Area irrigated	Gross area irrigated	Canals	Tanks	Wells	Lifts	Net Area irrigated	Gross area irrigated
Karveer	-	213	1050	6396	7659.8	7749.2	-	133	2726	9215.3	12074.3	13429
Panhala	-	-	846	3068.9	3914.9	3920.4	-	-	620	3620	4240	4477
Hatkangale	-	91	4761.7	1948.4	6802	7031.4	-	-	3830	6070.6	9906.9	12330
Shirol	-	-	1970.8	1779.9	3750.7	3750.7	-	-	3290	9468.3	12758.3	14747.6
Kagal	-	174	864.6	2058.8	3097.7	3097.7	-	-	838	1855	2093	3048
Gadhinglaj	-	2.4	1114.7	829	1946	1977.7	-	12	1995	2144	3656	4189
Chandgad	67.7	22.6	484.6	612	1187	1187	-	25	339	1954	2319	2337
Ajara	-	12.7	81.1	380	473	485.7	-	-	128.3	880	1008.3	1131.3
Bhudargad	-	9.3	58.8	1794	1862	1862.2	-	114	122.3	1842	2078	2390
Radhanagari	1689	-	199	1514	3902	3903	-	-	552	4300	4852	5213.6
Gaganbavada	-	-	37	640	677	677	-	-	37	886	923	923
Shahuwadi	-	-	236.6	2505	2742	2929	-	-	460	3381	3841	3745
District	1757	514 525	11706	21746	35724	38071	-	345	14438	45622	60405.7	67980

Source : Socio-Economic Review and District statistical abstracts of Kolhapur District.

and electric pumps. They have replaced the indigeneous methods of lifting the water by pair of bullocks by persian wheel and by man power.

The present lifts are operated on river banks in this region by constructing 'Kolhapur Type' of weirs. The region is wellknown for the lift irrigation schemes in Maharashtra. Industrious farmers of Kolhapur with the spirit of development have formed the co-operative lift irrigation societies to enable member cultivators to pool their resources for the purpose of lift irrigation plant machinery.

Lift irrigation accounts for about 75.5% of total irrigated area in the region. The very high and high percentage (over 75%) of area under lift irrigation are confined mainly to the central, and western parts of the region. It is mainly due to river Panchanganga and her tributaries, which are made perennial by constructing numerous Kolhapur type of weirs. Moderate (65 to 75%) and low (55 to 65%) proportion is observed in eastern and north eastern part of the region where well irrigation is also important.

b) Well irrigation

The well irrigation is an important indigenous method of irrigation as old as agriculture. The wells used for irrigation are generally circular with a diameter of 3 to 4 meter and depth of 6 to 12 meter. The water is lifted by 'Mot'

(a leather or iron container) which is worked by a pair of bullocks and irrigates about 2.5 hectare a day. Now adays oil engines and electric motors are also set up to lift the water for irrigating the fields.

Well irrigation accounts for about 24.47% of total irrigated area in the region. Its distribution varies from west to east. High percentage (over 35% of total area irrigated) of area under well irrigation are confined mainly to the eastern part of the region. Moderate percentage (over 25%) is confined to the north eastern part particularly in Shirol tahsil. Low percentage (below 15%) is observed in the western parts of the region.

B. Intensity of irrigation :

The intensity of irrigation i.e. the ratio of the irrigated area to net sown area is high (over 20%) in the central and north eastern part of the region (Fig.2-1,B). It is due to the construction of Kolhapur type of weirs and development of lift irrigation societies by which cultivators could bring additional land under irrigation. Moderate percentage (10 to 20) is noted in Panhala and Radhanagari tahsils. Low (5 to 10%) and very low (below 5%) is observed in western southern and eastern part of the region; due to unsuitability of topography for the development of lift irrigation on one hand and large fluctuations in water table have adversely affected on the development of well irrigation in this part.

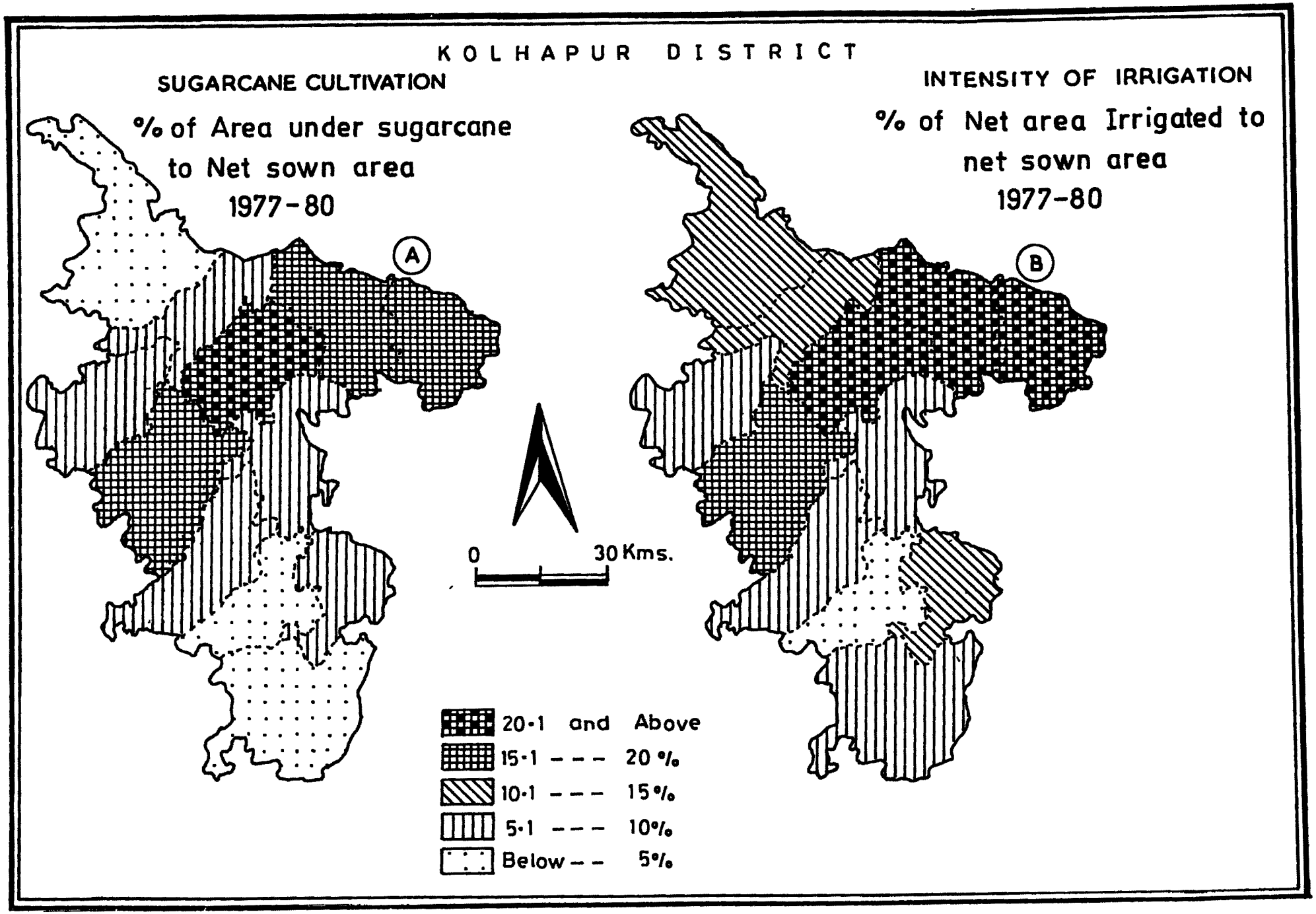
KOLHAPUR DISTRICT
SUGARCANE CULTIVATION
% of Area under sugarcane to Net sown area 1977-80
A
INTENSITY OF IRRIGATION
% of Net area Irrigated to net sown area 1977-80
B
0
30 Kms.
20·1 and Above
15·1 --- 20 %
10·1 --- 15 %
5·1 --- 10%
Below -- 5%

Fig. 2·1

4. A. Cropping pattern :

Agriculture is the main source of livelihood of more than 70% of the population in Kolhapur district. It plays a pivotal role in the economic development of the district. Apart from providing food the people it provides raw material for the industrial development also.

The salient features of agricultural land utilization and important major crops of Kolhapur district are discussed below.

51.93% of the total geographical area of the district is classified as net cropped area. Kolhapur is a predominantly Kharif crop growing district. 95% of the crops are grown in Kharif season. About 68.89% of the net sown area is under food crops of which 23.37% is under rice and 10.02% under jowar. Total cereals contribute 48.89% of the net sown area. Sugarcane and groundnuts share about 11.65% and 12.04% of the N.S.A. respectively.

It is evident that paddy, jowar, sugarcane, groundnut, fodder, tobacco are the important crops of the region.

The spatial distribution of the crops in uneven, in the district. In almost all the tahsils paddy is cultivated. Karveer tahsil ranks first in rice hectarage (12,079) in the district followed by Chandgad (10,654) and Radhanagari (10,354). Whereas jowar comes from the eastern tahsils of Hatkangale, Shirol, Kagal

Table 2.4 Area under different crops in Kolhapur district (1977-80).

Sr. No.	Crops	Area in hectares	% to net sown area
1.	Rice	99,040.66	23.37
2.	Wheat	10,435.33	2.46
3.	Jowar	42,472.00	10.02
4.	Bajara	917.66	0.21
5.	Ragi	40,569.66	9.57
6.	Sava	6,257.33	0.86
7.	Other cereals	7,493.00	1.76
8.	Total cereals	2,07,185.66	48.89
9.	Gram	6,850.33	1.61
10.	Tur	5,160.00	1.27
11.	Other pulses	12,517.00	2.95
12.	Total pulses	24,527.00	5.78
13.	Total food grains	2,31,713.00	54.68
14.	Sugarcane	49,407.00	11.65
15.	Chillies	7,744.00	1.82
16.	Total condiments and spices	7,889.00	1.86
17.	Fruits and vegetables	2,919.00	0.68
18.	Total food crops	2,91,929.00	68.89
19.	Total fibres	1,053.00	0.24
20.	Groundnut	51,035.00	12.04
21.	Total oil seeds	53,126.00	12.53
22.	Tobacco	5,687.00	1.34
23.	Total drugs and Narcoties	5,796.30	1.36
24.	Fooder crops	85,857.00	20.30
25.	Total non food crops	1,45,837.60	34.41
26.	Total gross cropped area	4,37,766.00	103.31
27.	Area cropped more than once	14,028.00	3.31
28.	Total net area under crops	4,23,739.00	100.00

Source : Director of Agriculture M.S.Pune.

and Gadhinglaj. Pulses and oil seeds are grown in all the tahsils of the district, but important pluses growing tahsils are Hatkangale, Shirol, Kagal and Karveer. The groundnut and tobacco are cultivated in tahsils of Hatkangale, Gadhinglaj, Kagal and Shirol.

Table 2.5 Tahsilwise area under Sugarcane (1977-80).

Sr. No.	Tahsil	Area in (hect.)	Percentage to net sown area
1.	Karveer	12,178	26.59
2.	Panhala	3,801	12.63
3.	Hatkangale	7,019	15.16
4.	Shirol	7,950	18.85
5.	Kagal	2,595	6.22
6.	Gadhinglaj	3,432	8.32
7.	Chandgad	2,177	4.96
8.	Ajara	800	2.75
9.	Bhudargad	1,937	7.43
10.	Radhanagari	5,136	16.41
11.	Gaganbavada	901	4.66
12.	Shahuwadi	1,481	4.66
	District	49,407	11.65

Source : Director of Agriculture M.S., Pune.

Table 2.6 Tahsilwise sugar factories in Kolhapur district

Sr. No.	Name of the Sugar factory	Tahsil	Year of establishment
1.	Kolhapur cane sugar works, Kasaba bavada	Karveer	1933-34
2.	Bhogavati S.S.K.,Parite	Karveer	1958-59
3.	Kumbhi Kasari S.S.K., Kuditre	Karveer	1963-64
4.	Shri Warana S.S.K., Waranamagar	Panhala	1959-60
5.	Shri Panchaganga S.S.K., Ichalkarnji	Hatkangle	1958-59
6.	Datta S.S.K.,Shirol	Shirol	1973-74
7.	Shri Dudhaganga Vedhganga S.S.K.,Bidri	Kagal	1962-63
8.	Chh.Shahu S.S.K.,Kagal	Kagal	1980
9.	Dault S.S.K.,Halkarni	Chandgad	1977-78
10.	The Gadhinglaj S.S.K. Gadhinglaj	Gadhinglaj	1980

Sugarcane is the most important cash crop in the district. Out of the total 49,407 hectares of land under sugarcane, the tahsils in the western hilly areas particularly Ajara, Chandgad, Bhudargad, Gaganbavada, Shahuwadi, claim only 26.7%. Almost all the tahsils in the district except Ajara, and Gaganbavada, have more than 1000 hectare areas under sugarcane cultivation. The three tahsils in the central zone viz. Karveer, Kagal and Gadhinglaj claim 41.13% of net sown area under sugarcane, in the district. It is noted that Karveer tahsil stands first in this

respect comprising 26.59% of the new area sown in the tahsil. The central and estern tahsils are well drained by the rivers and have good network of irrigation facilities, hence these tahsils have also a considerably high proportion of land under sugarcane (Fig.2-1A).

B. Irrigated cropping pattern :

Table 2.7 Irrigated cropping pattern.

Sr. No.	Crops	1960-63		1977-80	
		Area in hectares	%	Area in hectares	%
1.	Rice	2,257.48	5.92	5,524.0	8.12
2.	Wheat	1,458.43	3.83	9,793.0	14.40
3.	Jowar	-	-	-	-
4.	Maize	-	-	1,610.0	2.36
5.	Total cereals	5,364.10	14.09	16,997.0	25.00
6.	Gram	107.96	0.28	270.0	0.39
7.	Total pulses	107.96	0.28	270.0	0.39
8.	Total food grains	5,472.00	14.37	17,267.0	25.39
9.	Sugarcane	30,795.00	80.89	49,193.0	72.70
10.	Total food crops	37,865.00	99.46	67,639.6	99.50
11.	Total non food crops	205.53	0.53	340.5	0.50
	Total gross area irrigated	38,070.70	100.00	67,979.6	100.00

Source : Socio-Economic Review & district statistical abstra.Kop.

It is evident from the Table 2.7 that major irrigated area (above 70%) is shared by sugarcane in the region. However the fall under sugarcane area is observed during the last two decades. It is mainly due to the diversion of farmers from cultivating traditional sugarcane crop to irrigated paddy and wheat. The irrigated area shared by other crops is very insignificant.

5. Agricultural implements :

Tillage is one of the oldest agricultural operations. The main functions of tillage are to modify the soil structure in such a way, as to produce suitable tilth for germination of seeds and subsequent growth of plants. It is also important to incorporate manure into soil. Inorder to promote favourable conditions, tillage under scientific conditions becomes necessary.

On the whole, sub marginal, marginal, and small farmers are conservative and their farm implements are so closely adjusted to their socio-economic environs that there is little possibility of change in their attitude unless the whole fabric of farm economy is shaken. Perhaps more often than mere conservatism, the small size of holding subsistance grain farming and limited economic means inhabit the use of modern implements. Further, the ease in tilling a soil, depending on its softness or hardness to a significant degree determines the density of wooden or iron based plougning implements. Tractor is one of

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the modern implements used for several operations in agriculture and transporatation.

a) Wooden ploughs

Although the region under study is experiencing adoption of improved implements, the use of traditional implement is still dominant. The wooden ploughs, iron ploughs and other implements associated with subsistance agriculture are common. Wooden plough is a traditional implement which is widely used by the farmers in the hilly parts of the west. Very high concentration above 301 ploughs per 1000 hectare of cultivated area is confined to the western part of the district (Fig.2-2A). The high proportion of wooden ploughs in the hilly parts is due to its portability and suitability for the poor soils. Moderate (101 to 300) and low (below 100) concentration is confined to the eastern and north eastern part of the district; due to the significant use of iron based implements and mechanical force.

b) Iron ploughs

Iron plough facilitates deep ploughing as compared to wooden plough. According to their capacity for deep ploughing the iron ploughs are drawn either by two, three, four or more pairs of bullocks. Very high concentration above 51 per 1000 hectares cultivated area is confined to the north eastern part of the district, where intensive arable farming dominates the agricultural landscape (Fig.2-2B). Moderate density (31 to 11)

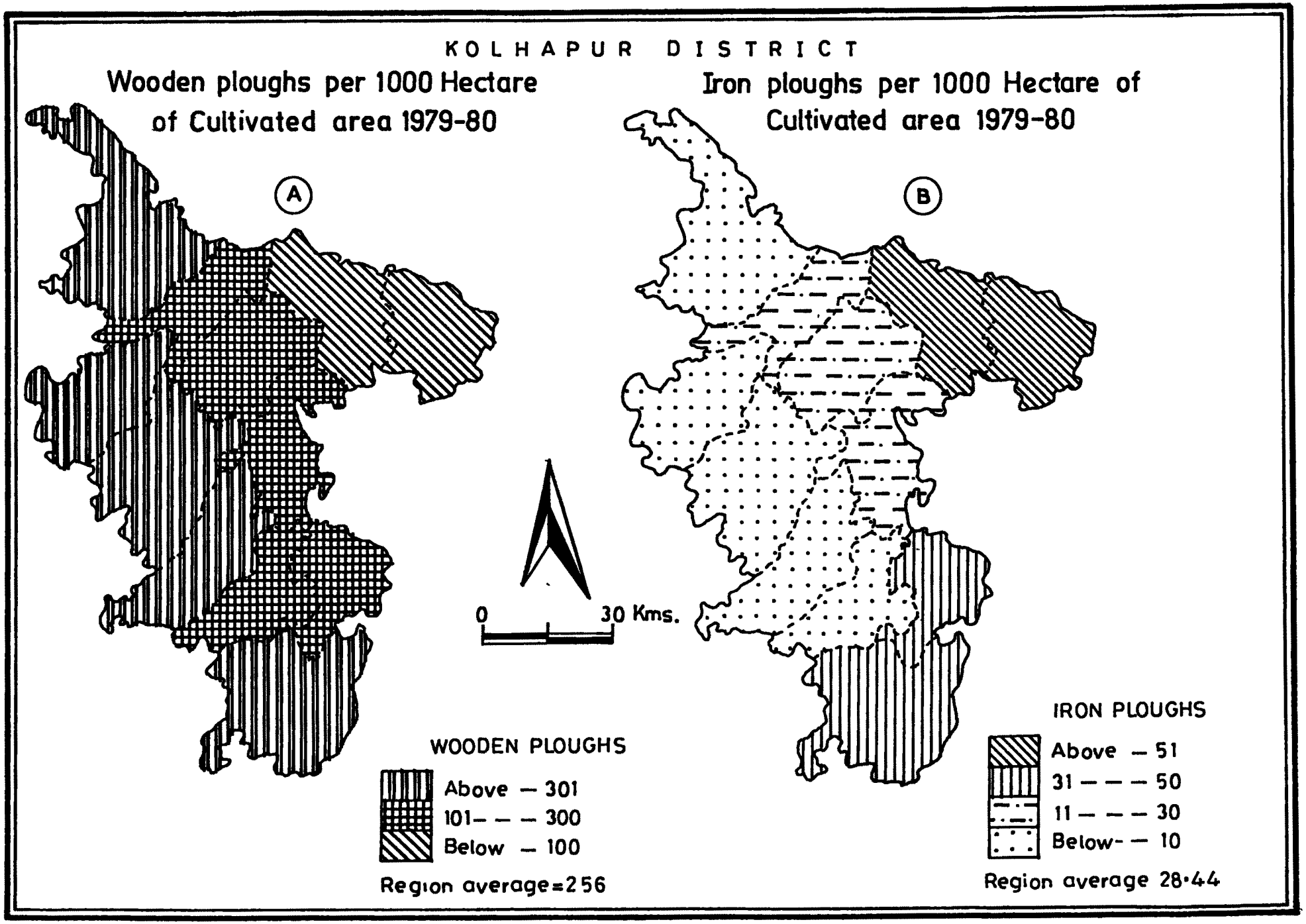
KOLHAPUR DISTRICT
Wooden ploughs per 1000 Hectare of Cultivated area 1979-80
Iron ploughs per 1000 Hectare of Cultivated area 1979-80
A
B
0
30 Kms.
WOODEN PLOUGHS
Above — 301
101— — — 300
Below — 100
Region average=256
IRON PLOUGHS
Above — 51
31 — — — 50
11 — — — 30
Below- — 10
Region average 28·44

Fig. 2·2

prominently covers the central and southern parts of the district. In the western part the density is low (below 10) where the iron ploughs miss fit.

c) Tractor

Tractor, a labour saving input is used for several operations in agriculture. Also it has become an essential vehicle for the transportation of sugarcane from cane farms to sugar factories and inputs like fertilizers, manures, required machines etc. upto farms. Neverthless it is also used for deep ploughing and preparation of furrow required for better plantation of sugarcane. The sugarcane growers who have relatively large sized cane-holdings and substantial income can afford to heavy investment in such improved implements. It should be noted that in the sugarcane areas, even small cane land holders hire the tractors for different land operations.

A tractor is not only a superior means to operate a farm, it is also a status symbol in agricultural society. Mechanisation of agriculture is taking its roots where sugarcane a cash crop, is grown. The farmers in sugarcane pockets are able to invest more in such improved implements due to their increased incomes from this crop. It is stated by Daniel (1976) that "Increased application of modern inputs leads to higher level of agricultural production". In the study region the number of tractors has gone upto 1912 in 1982 which was 89 in 1961. At present the district

comprises 11% of the states total tractors. The detailed analysis is made in chapter IV.

Use of tractor in sugarcane cultivated areas

Tractor is an important implement which has become popular in sugarcane areas due to its multiple uses for the preparation of cane lands. The availability of tractors per 1000 hect. of sugarcane area in each tahsil of Kolhapur district is given in Table 2.8 .

Table 2.8 Tahsilwise tractors per 1000 hectares of sugarcane area, 1979-80.

Sr.No.	Tahsil	No. of Tractors
1.	Karveer	50
2.	Hatkangale	40
3.	Shahuwadi	40
4.	Kagal	40
5.	Panhala	30
6.	Shirol	30
7.	Gadhinglaj	30
8.	Radhanagari	12
9.	Chandgad	10
10.	Ajara	10
11.	Gaganbavada	10
12.	Bhudargad	5
	District	26
	State	

Source : Compiled by the author.

Table 2.8 reveals that very high concentration with 50 tractors per 1000 hect. cane cultivated area is in Karveer tahsil only. It is followed by Hatkangale (40), Kagal (40), Shirol, Panhala and Gadhinglaj (30). Availability of tractors is very less in Ajara, Bhudargad, Gaganbavada, Chandgad, tahsils because of the rugged topography of the region and socio-economic conditions of the farmers. Assured income from sugarcane, reliable and assured market for cane, financial assistance by co-operative banks and awareness of farmers in using mechanical power in fields all these factors are responsible for high tractorisation in Karveer, Hatkangale, Shirol and Panhala tahsils.

The availability of tractors per 1000 hect. of cultivated area was only 0.88 in 1961 in Karveer tahsil, which rose upto 12.43 in 1980-81. Fig.2-3 reveals that the availability of tractors per 1000 hectares of cultivated area is high (above 6.1), in the central and north eastern part of the district. It is mainly because of the wide spread of well irrigation and lift irrigation along the rivers, moderate and deep fertile alluvial soils in river valleys and development of sugar factories (Table 2.6). Moderate (3.1 to 6) and low (1.1 to 3) availability of tractors is observed in the north western and eastern part of the district. Whereas very low (below 1) is found in the southern and western part (except Radhanagari tahsil), because of the hilly region and low intensity of irrigation.

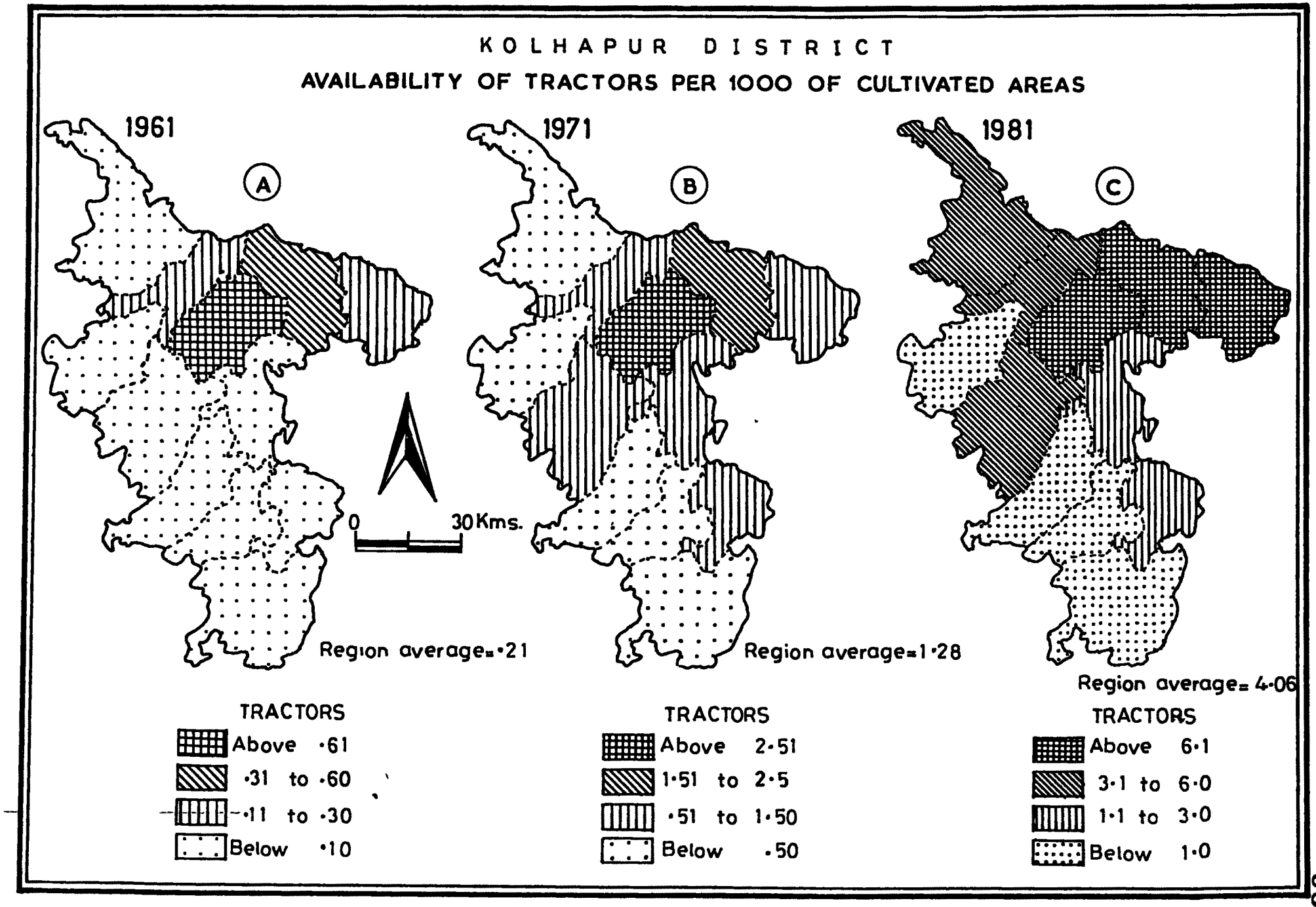
KOLHAPUR DISTRICT
AVAILABILITY OF TRACTORS PER 1000 OF CULTIVATED AREAS
1961
A
1971
B
1981
C
0
30 Kms.
Region average=·21
Region average=1·28
Region average= 4·06
TRACTORS
Above ·61
·31 to ·60
·11 to ·30
Below ·10
TRACTORS
Above 2·51
1·51 to 2·5
·51 to 1·50
Below ·50
TRACTORS
Above 6·1
3·1 to 6·0
1·1 to 3·0
Below 1·0

Fig. 2·3

Table 2.9 Availability of Tractors (per 1000 hect. of cultivated area).

Sr.No.	Tahsil	1960-61	1970-71	1980-81
1.	Karveer	0.88	5.29	12.43
2.	Panhala	0.13	1.34	3.42
3.	Hatkangale	0.49	1.80	6.20
4.	Shirol	0.25	1.23	6.20
5.	Kagal	0.09	1.17	2.92
6.	Gadhinglaj	0.07	0.58	2.39
7.	Chandgad	0.02	0.18	0.76
8.	Ajara	0.03	0.03	0.41
9.	Bhudargad	-	0.08	0.34
10.	Radhanagari	0.03	1.36	3.32
11.	Gaganbavada	-	0.09	0.76
12.	Shahuwadi	0.03	0.42	3.08
	District	0.21	1.28	4.06
	State	0.07	0.33	-

Source : Compiled by the author.

d) Carts

The number of carts for agricultural use are unevenly distributed in the district. Carts are relatively more (above 100 per 1000 hect. of cultivated area) in the central and eastern zone of the district. Where they are used for

transporting sugarcane to factories also. Whereas low density (below 100) is noted in the western part of the district.

e) Oil engines

Oil engine is another technical aid to agriculture. The development of sugarcane cultivation is largely influenced by the introduction of oil engines particularly after Independence. The number of oil engines has considerably increased during the last twenty five years. Oil engines are used for lifting the water either from wells or rivers.

Very high concentration above 61 oil engines per 1000 hect. of cultivated area is confined to the north central part of the district (Fig.2-4A). Moderate concentration is (21 to 60) found in the central, southern, and western part, where low (below 20) concentration is confined to the north eastern zone of the district; due to the increase in the adoption of electric pumps for lifting the water.

f) Electric pumps

Use of electric pumps, particularly for irrigation purpose, is a significant component of physical infrastructure of agriculture in the district. Rural electrification has increased the tempo of energization of pumps.

The high proportion of electric motors, (above 61 per 1000 hect. of cultivated area) is confined to the north eastern

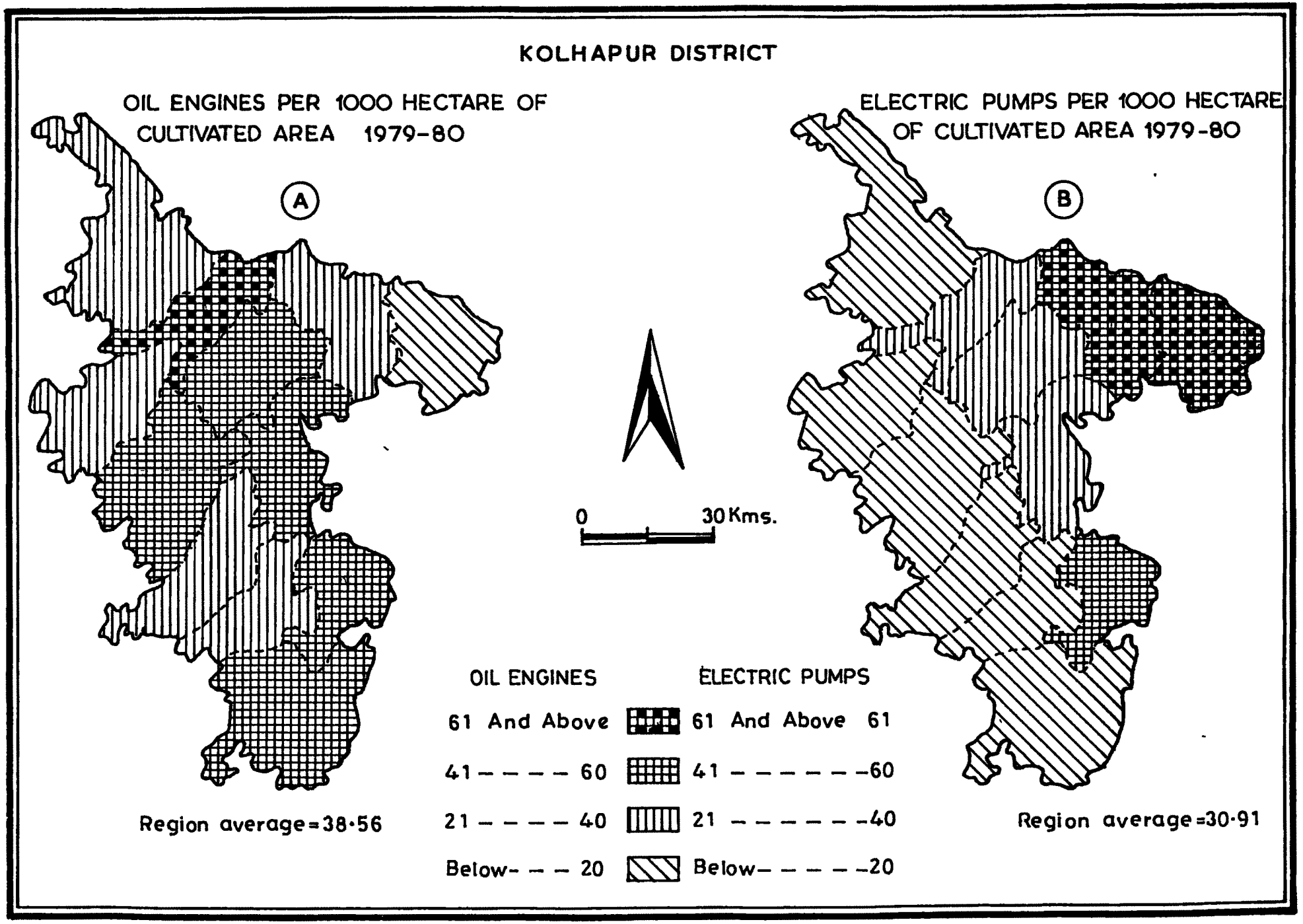
KOLHAPUR DISTRICT
OIL ENGINES PER 1000 HECTARE OF CULTIVATED AREA 1979-80
ELECTRIC PUMPS PER 1000 HECTARE OF CULTIVATED AREA 1979-80
A
B
0
30 Kms.
OIL ENGINES
ELECTRIC PUMPS
61 And Above
61 And Above 61
41 - - - - 60
41 - - - - - - 60
21 - - - - 40
21 - - - - - - 40
Below- - - 20
Below- - - - - 20
Region average=38·56
Region average=30·91

Fig. 2·4

zone of the district (Fig.2-4B). It is mainly because of the wide spread of well irrigation and lift irrigation. Moderate (21 to 60) concentration is confined to the central and eastern zone, because of the development of lift irrigation along the rivers, whereas low density (below 20) is observed in the western zone of the district. It is because of the rugged topography, low rural electrification and relatively more reliance on oil engines for irrigation purpose.

g) Sugarcane crushers

Sugarcane crushers are worked either with bullock or machine power. Prior to the establishment of sugar factories almost all the cane production was consumed by Gur industry. The number of cane crushers operated by bullock has decreased, whereas power operated cane crushers have increased. The pocket of high concentration is confined to the tahsils of Karveer (506), Chandgad (320), Panhala (240), due to long distances from sugar factories and a common tendency among the farmers to utilise cane for gur. Infact the inception of sugar factories have attracted farmers by providing facilities like finance, fertilizers, pumps, other necessary inputs etc. However, large number of sugarcane crushers in this region may be attributed to high cane production to support both gur and sugar industry.

6. Summary :

Agriculture plays a very important role in the economic

development of the district. The general landuse pattern in western part of the district is in many ways different than that of eastern. In the western tahsils the percentage of fallow land and cultivable waste land is more as compare to eastern tahsil. About 70% of the land holders are either marginal or small farmers. Lift irrigation plays a very important role as a source of irrigation in the region. It is mainly due to river Panchanganga and her tributaries; which are made perennial by constructing numerous Kolhapur type of weirs. Rice sugarcane, fodder and groundnut are the important crops of the region. But the spatial distribution of the crops is uneven. The district ranks third in the state for the adoption of tractors for agricultural purposes. However the use of traditional implements still dominates in the region. In general it is observed that the central and eastern part of the district is relatively more developed than the western and southern hilly parts.

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