
SOURCES OF IRRIGATION

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2.1 INTRODUCTION :

In the previous chapter an attempt is made to analyse the physiographic and demographic factors as a basis for irrigation and agriculture. The present chapter aims to highlight the progress of irrigation facilities source wise since plan period. The intensity of irrigation and changes therein are also attempted in this chapter.

The sources of irrigation in Maharashtra are largely affected by the physical features, such as topography and soil. Presently the region has four different sources of irrigation, viz. well, canal, tank and other sources of irrigation. The topography is mostly suitable for the development of well irrigation and less suitable for tank irrigation (Pawar, 1985).

The well irrigation is widespread in upland districts of Deccan plateau where above 80% of the irrigated area is covered by this source only. Owing to the non-availability of perennial stream the canal, lift and tank irrigation are less developed in this part. The well irrigation occupies about 43.20% of the total irrigated area in the state. The canal irrigation occupying about 14.27% of total irrigated area is observed only along the lower reaches of major river basins of the state. Whereas tank irrigation (10.17%) is largely confined to eastern parts of the state comprising Chandrapur, Gadchiroli, Bhandara, and Nagpur districts. The other sources of irrigation containing lift irrigation as a major source, share about 32.35%

Table 2.1 : Area irrigated by different sources in Maharashtra State.

Sr. No.	Year	(Area in '000' hectares)						
		Canals	Tanks	Wells	Other Sources	Net Area Irrigated	Gross Area Irrigated	
1	1950-51	231(27.15)	179(21.03)	405(47.59)	36(04.23)	851	960	
2	1955-56	226(24.70)	181(19.80)	474(51.80)	34(03.70)	915	1052	
3	1960-61	244(22.86)	193(18.00)	595(55.40)	41(03.74)	1073	1220	
4	1965-66	249(20.60)	190(15.75)	711(58.95)	57(04.70)	1207	1388	
5	1970-71	288(21.38)	205(15.21)	768(57.01)	86(06.38)	1347	1570	
6	1975-76	349(14.57)	244(10.19)	1084(45.27)	717(29.94)	2394	2771	
7	1980-81	374(14.27)	267(10.18)	1132(43.20)	848(32.35)	2621	3188	
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% change of 1950-51 to 1980-81		- 12.19	- 10.85	- 04.79	+ 27.83	+ 27.83	-	
<hr/>								
Absolute increase or decrease 1950-51 to 1980-81		+143	+ 88	+727	+812	+ 1770	+2228	

Note : 1) Details do not add upto the totals due to rounding 1i) Districtwise yearly data available in Table 4.4 of Statistical Abstract of Maharashtra State 11i) * Refers to the total net irrigated area by surface irrigation 1v) Figures in brackets indicates % to total net irrigated area.

SOURCE : Director of Agriculture Maharashtra State, Pune (Enitome, Part-II).

TRENDS OF IRRIGATION IN MAHARASHTRA

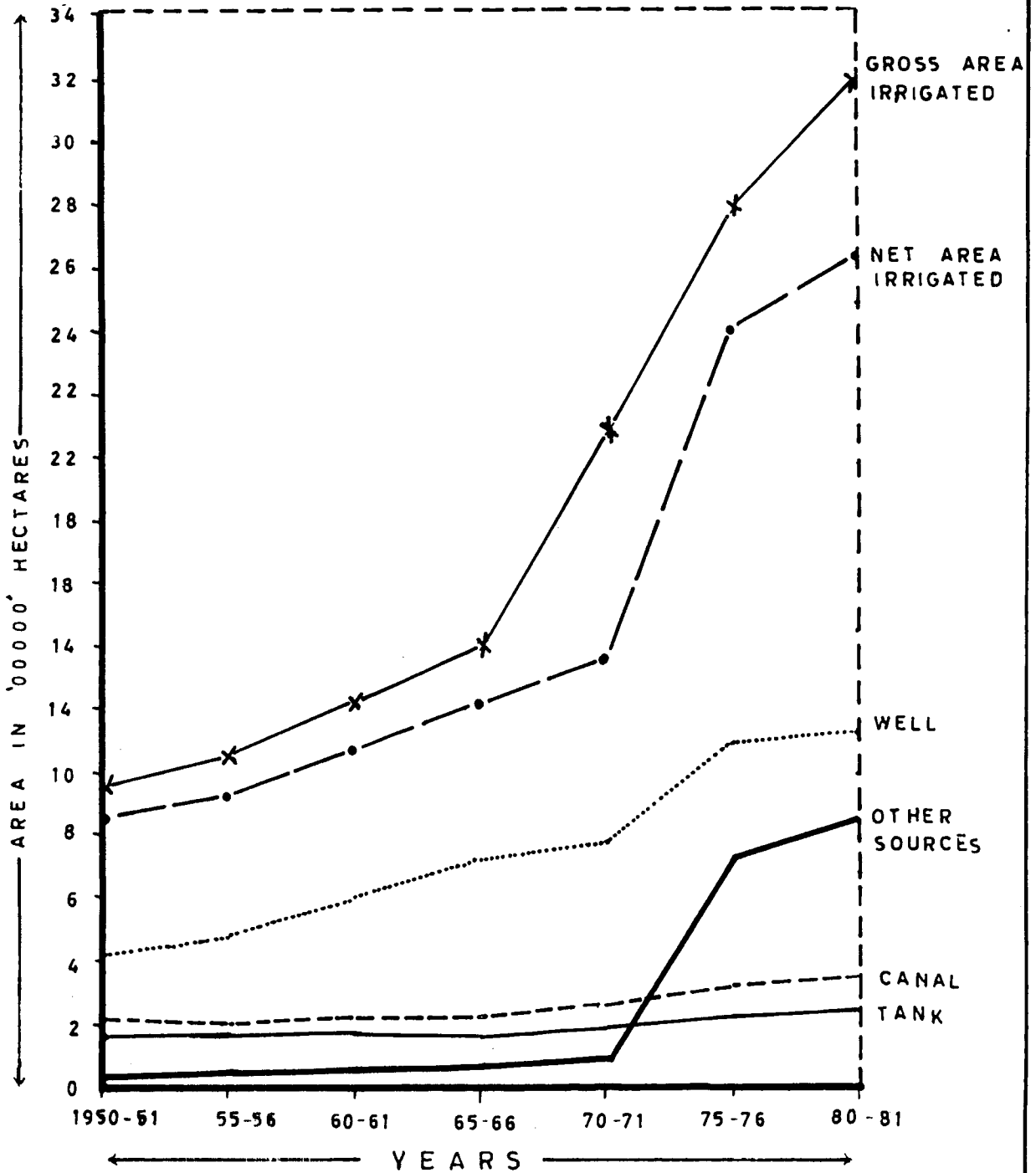


FIG. 2.1

of the total irrigated area. It is largely confined to the districts of Kolhapur, Ratnagiri, Satara, Sangli and Nasik (Fig.2.5-A).

The area brought under irrigation with the help of various sources during the last 35 years is depicted in Fig.

2.1. In Maharashtra gross irrigated area in 1950-51 was 960 thousand hectares while the net irrigated area was 851 thousand hectares. The gross irrigated area increased upto 3,188 thousand hectares and the net irrigated area upto 2,621 thousand hectares during above mentioned period.

2.2 MAJOR SOURCES OF IRRIGATION :

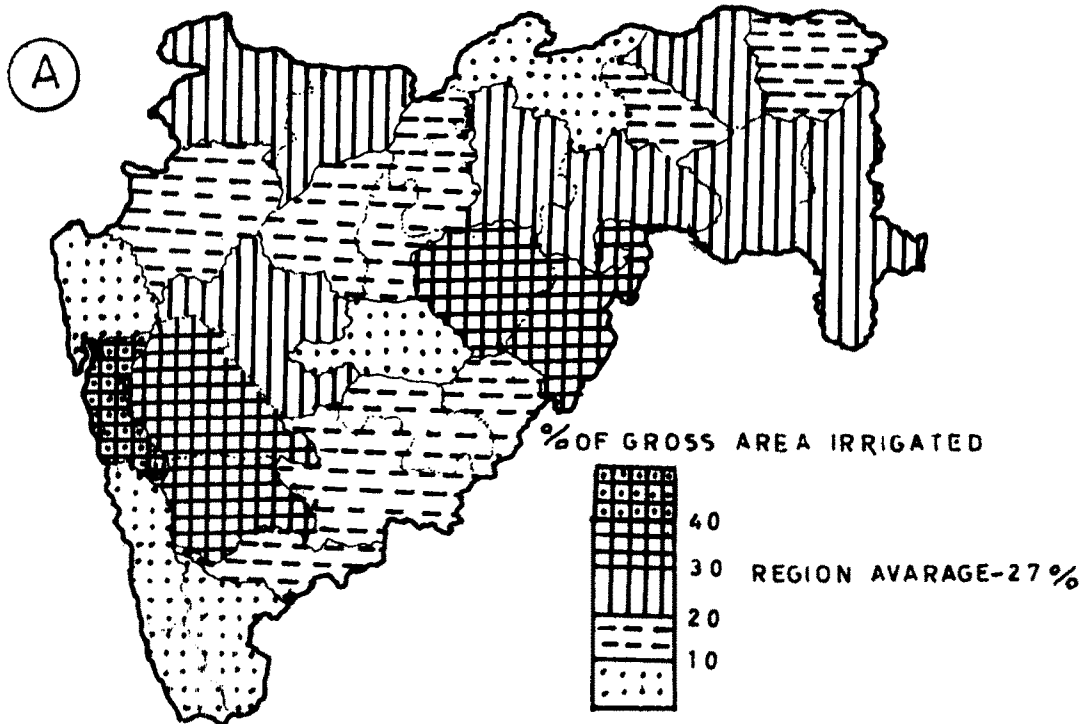
The important sources of irrigation in Maharashtra are

- i) Canal Irrigation
- ii) Well Irrigation
- iii) Tank Irrigation
- iv) Other Sources of Irrigation

i) Canal Irrigation : The canal irrigation is developed in parts of major river basins. Moderate slope of land and perennial sources of water are responsible for the irrigation growth. The private canal system by diverting local stream water in the field for irrigation purpose is another feature. It has developed in the western hilly part, where 40% of the net irrigated area is under this sources of irrigation (Fig.2.2-A). Canal irrigation contributes about 14.27% of the total irrigated area in the state.

a) Regional distribution (1981-83) : There is some regional imbalance in the development of these sources. Raigad district

MAHARASHTRA
CANAL IRRIGATION
1980 TO 1983



VOLUME OF CHANGE
1950-53 TO 1980-83

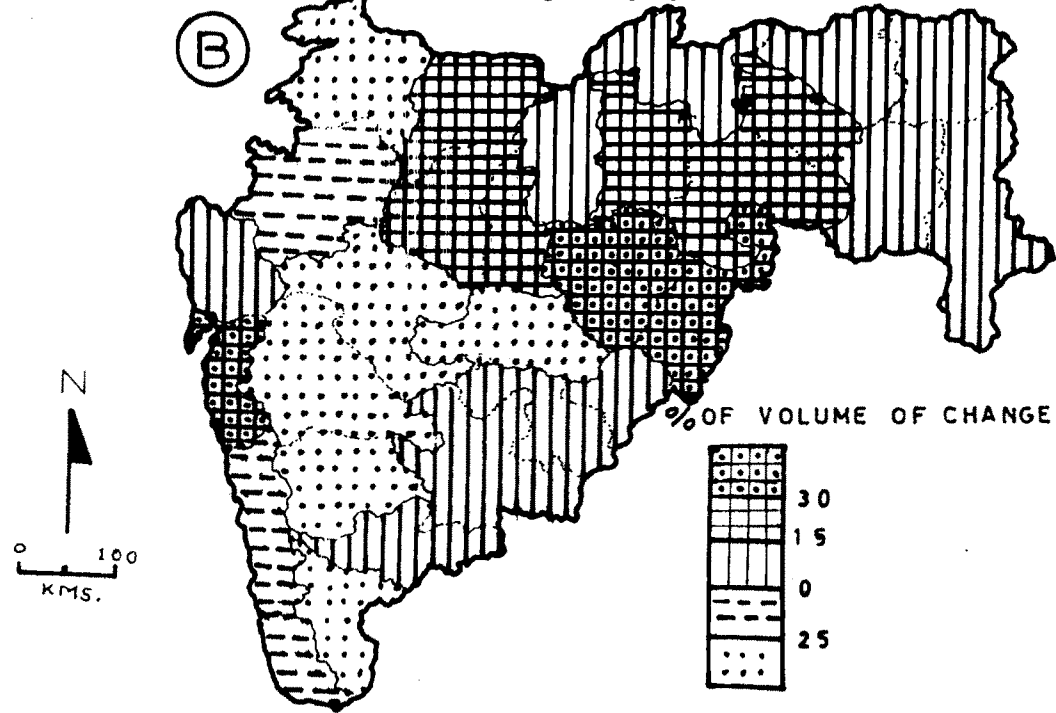


FIG. 2.2

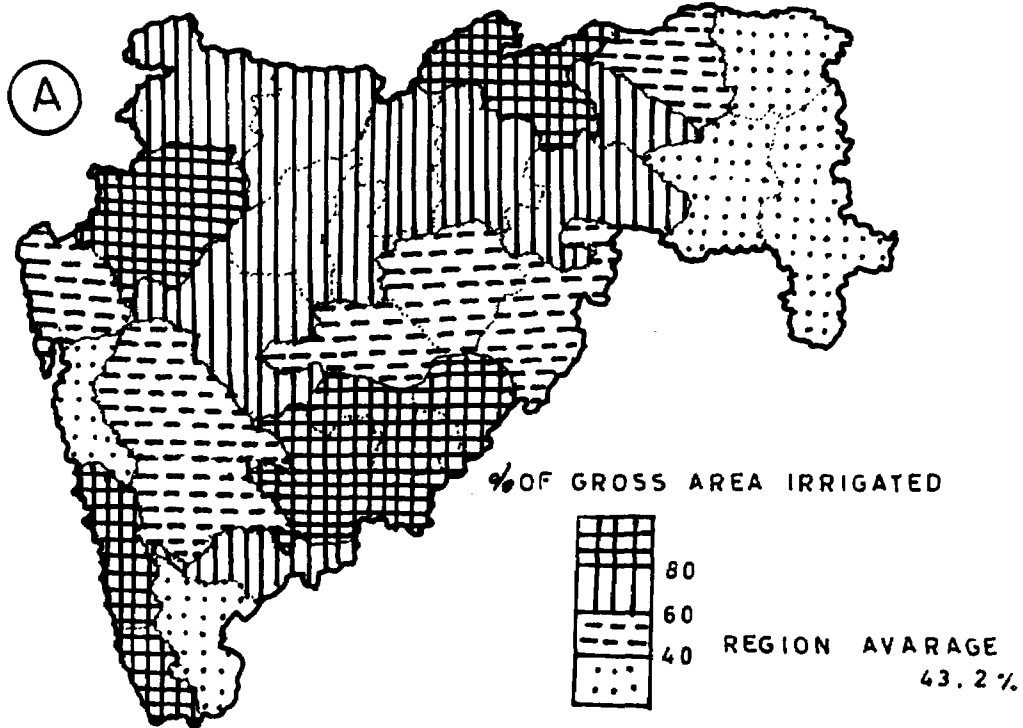
ranks first where private canal system is practised and high percentage (above 30%) of irrigated area is confined to the districts of Pune, Satara, Parbhani, and Nanded. Moderate development (20 to 30%) of canal irrigation is observed in the districts of Ahmednagar, Akola, Yeotmal, Jalgaon, Dhule, Nagpur, Chandrapur, and Gadchiroli. Relatively low development (10 to 20%) of this source is noted in the district of Sangli, Solapur, Osmanabad, Nasik, Aurangabad, Buldhana, Wardha, Bhandara, and very low percentage (below 10%) in Ratnagiri, Sindudurg, Kolhapur, Thane, Bhir and Amravati districts (Fig.2.2-A).

b) Volume of change (1951-53 to 1981-83) : The positive change in the distribution of canal irrigation is observed (below 15%) in the districts of Sangli, Solapur, Osmanabad, Latur, Thane, Buldhana, Amravati, Nagpur, Bhandara, Chandrapur, Gadchiroli. The moderate (positive) change (15 to 30%) and (above 30%) is noted in Aurangabad, Jalna, Jalgaon, Akola, Yeotmal, Vardha and Raigad, Parbhani and Nanded districts.

The negative change (below 25%) in this source is noted in the districts of Kolhapur, Satara, Poona, Ahmednagar, Dhule, Bhir, and (above 25%) in the districts of Ratnagiri, Sindudurg, Nasik. The negative change in this source is noted because this source could not keep pace with other sources (Fig.2.2-B).

ii) Well irrigation : The well irrigation is spread over large parts of the state. During this period under the study, the area under well irrigation has increased from 405 thousand hectares

MAHARASHTRA
WELL IRRIGATION
1980 TO 1983



VOLUME OF CHANGE
1950-53 TO 1980-93

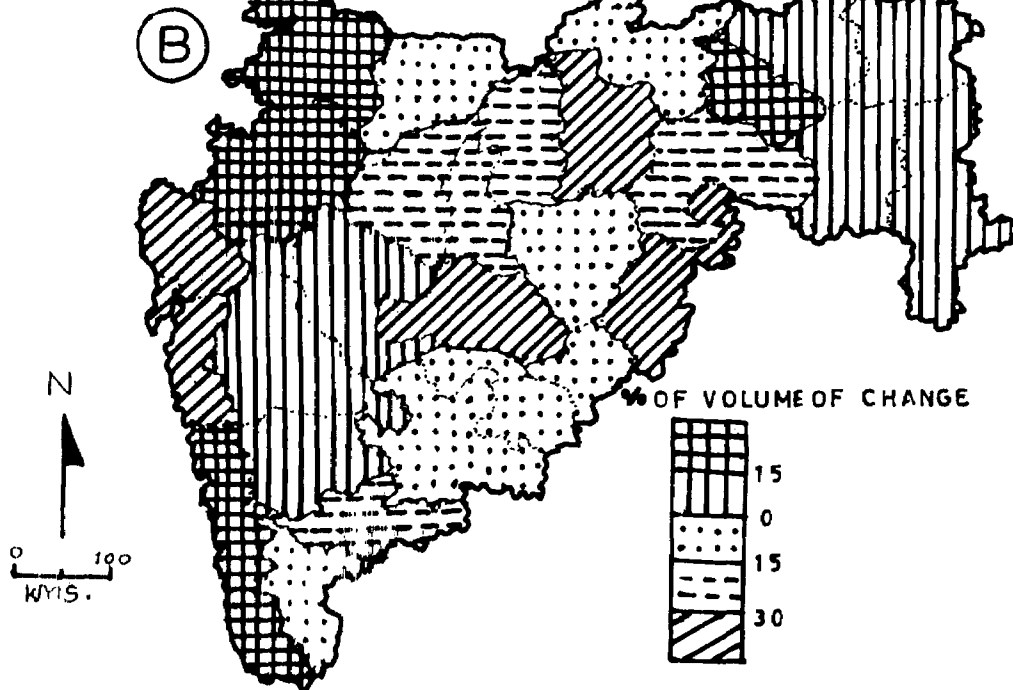


FIG. 2.3

to 1,132 thousand hectares. So far as the state is concerned, most parts of it rely on monsoon which is confined to 3 or 4 months of the year. When the monsoon fails the rainfed crops also fail. Hence this source is the only reliable source of water for agriculture in this part of the state.

a) Regional Distribution (1980-83) : There is comparatively higher percentage (above 80%) of the irrigated area by wells in the districts of Amravati, Nasik, Solapur, Osmanabad, Latur, Ratnagiri, Sindhudurg and high percentage (60 to 80%) in Sangli, Ahmednagar, Jalna, Dhule, Jalgaon, Buldhana, Akola, Yeotmal, Vardha districts. Moderate percentage (40 to 60%) under this source is noted in Satara, Pune, Bhir, Parbhani, Nanded, Nagpur, whereas low percentage (below 40%) in Raigad, Kolhapur, Bhandara and Chandrapur districts (Fig.2.3-A).

b) Volume of Change (1950-53 to 1980-83) : The positive change in the distribution of well irrigation is observed (below 15%) in the districts of Ahmednagar, Pune, Satara, Nagpur, Bhandara, Chandrapur, Gadchiroli; and above 15% in the districts of Vardha, Nasik, Dulia, Ratnagiri, Sindhudurg (Fig.2.3-B).

The negative change (below 15%) in this source is noted in Solapur, Osmanabad, Latur, Kolhapur, Parbhani, Amravati, and moderate change (15 to 30%) in Sangli, Bhir, Aurangabad, Jalna, Buldhana, Yeotmal districts. The negative change is noted (above 30%) in the districts of Thane, Akola, Nanded (Fig.2.3-B). The proportion of well irrigation has decreased during the last

three decades as it could not keep pace with the other sources of irrigation.

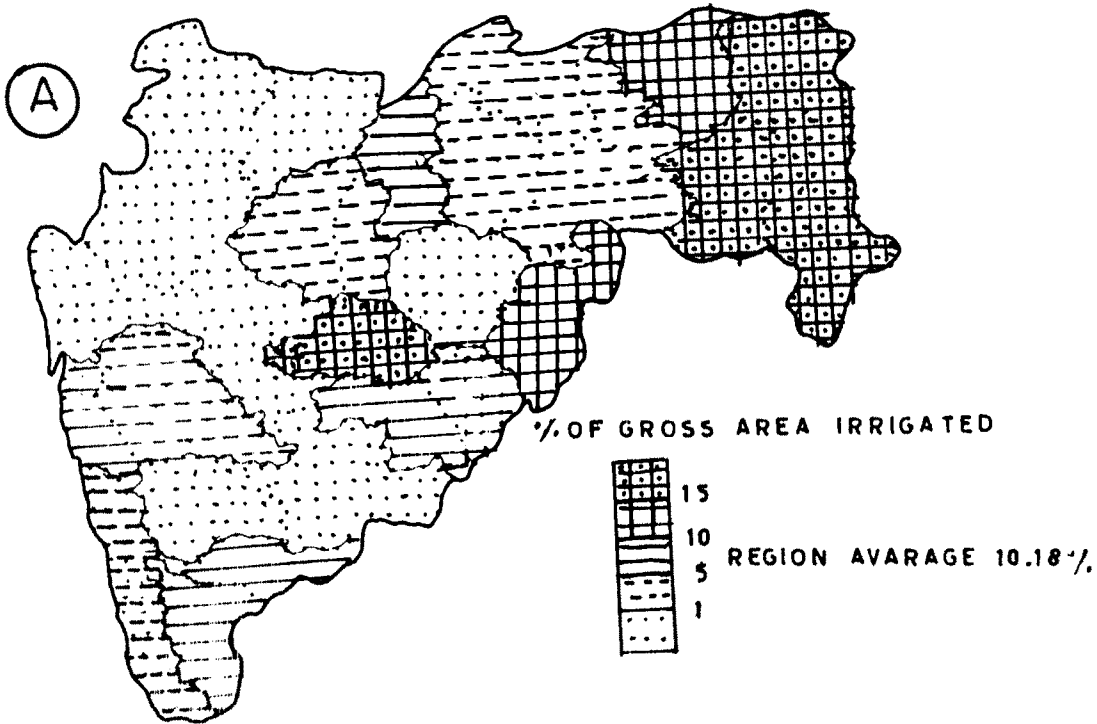
iii-A) Tank Irrigation : Tank irrigation is mostly found in Vainganga region and in Bhima basin in the state. At present only 267 thousand hectares of land is benefitted by the tank irrigation in the state, as whole which comes to about 10.18% of total irrigated area. The tank irrigation area has increased from 179 thousand hectares to 267 thousand hectares during last 35 years (Table 2.1).

a) Regional Distribution (1980-83) : Tank irrigation is confined to the eastern parts of the state. Very high (above 15%) concentration of this source is observed in the districts of Chandrapur, Gadchiroli, Bhandara, Bhir and high percentage (10 to 15%) of total irrigated area is observed in Nagpur, Nanded districts. Moderate percentage (5 to 10%) under this source is observed in the districts of Raigad, Buldhana, Osmanabad, Latur and elsewhere it is insignificant (Fig.2.4-A).

b) Volume of Change (1950-53 to 1980-83) : The positive change in area under tank irrigation is observed (below 1%) in the districts of Pune, Thane, Akola, Parbhani and moderate change (1 to 5%) in the districts of Sangli, Aurangabad, Jalna, Buldhana, Amravati, Yeotmal, Vardha, whereas above 5% in Raigad, Bhir, Osmanabad and Latur districts.

The negative change (below 1%) in tank irrigation is noted in the districts of Ratnagiri, Sindudurg, Satara, Solapur, Nasik,

MAHARASHTRA
TANK IRRIGATION
1980 TO 1983



VOLUME OF CHANGE
1950-53 TO 1980-83

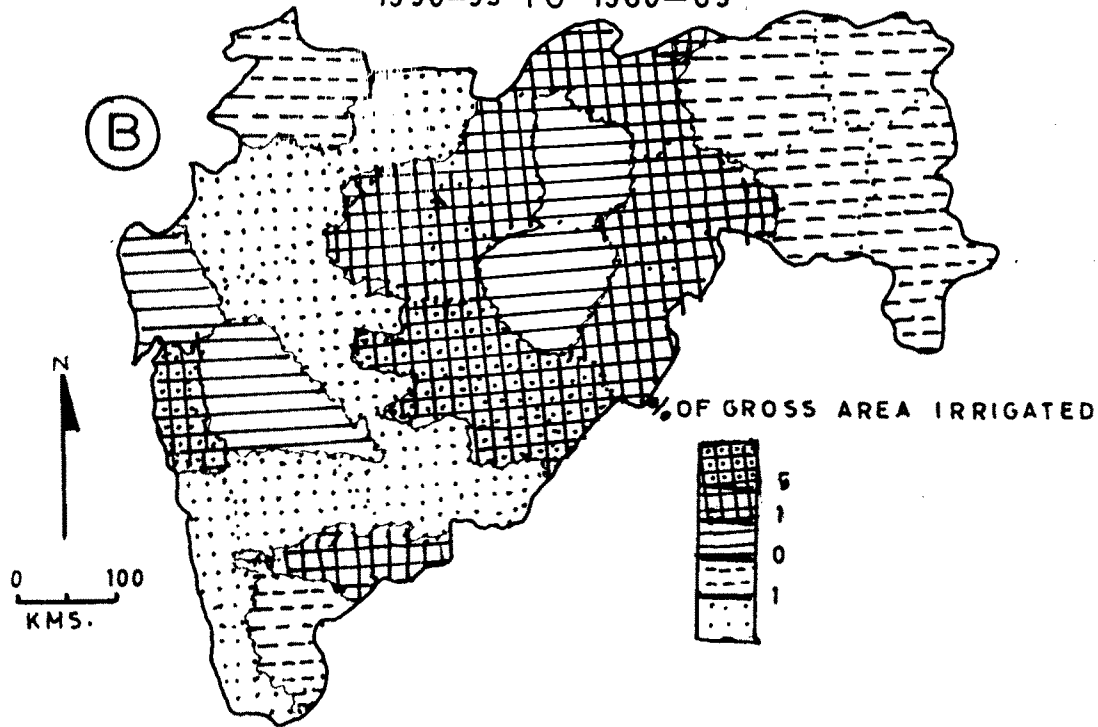


FIG. 2.4

Ahmednagar, Jalgaon, and above (1%) negative change in Kolhapur, Dhule, Nagpur, Bhandara, Chandrapur, Gadchiroli districts in the state (Fig.2.4-B).

iii-B) Percolation tanks : In recent days a technique for recharging the groundwater is adopted by constructing the mud walls across the small streams. This helps in increasing the watertable in the wells, increasing the yield of crops etc. (Pawar,1981). In the study made by the Fact Finding Committee, it was observed that groundwater supply by percolation tanks is increased almost by three times. The work of constructing the percolation tank in the state was launched mainly as a relief measure during the famine of 1972-73. It is largely confined to the drier parts of the region which are drought-prone. Nevertheless, the percolation tank has become a special feature of drought-prone area. However, desilting of such tanks seems to be necessary once in three years for their proper functioning.

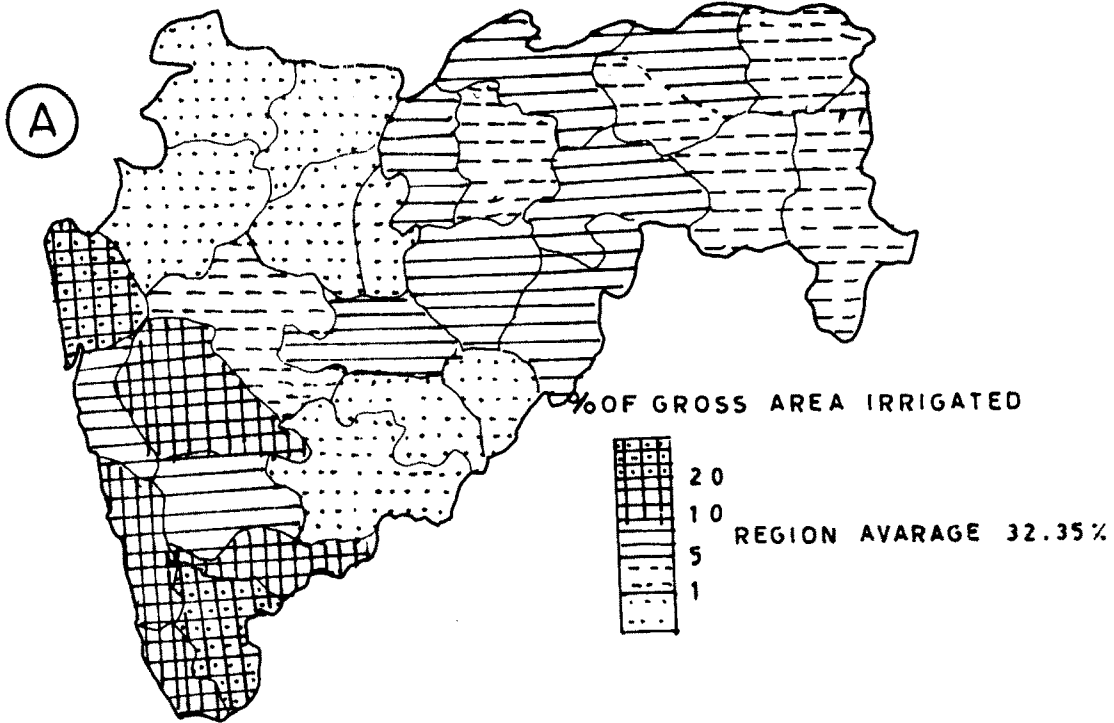
iv) Other Sources of Irrigation : It includes various minor sources by which temporary irrigation is made available. Among other sources of irrigation the lift irrigation is important sources of growing crops.

(1) Lift Irrigation : Lift irrigation schemes are provided to lift up the water from the surface flow of Nala, River, Canal, Tanks, Lakes, Wells etc. Presently, the lifts are operated on river banks particularly in Kolhapur, Satara, Sangli and Nasik districts by constructing 'Kolhapur Type' of weirs.

MAHARASHTRA

LIFT IRRIGATION

1980 TO 1983



VOLUME OF CHANGE

1950-53 TO 1980-83

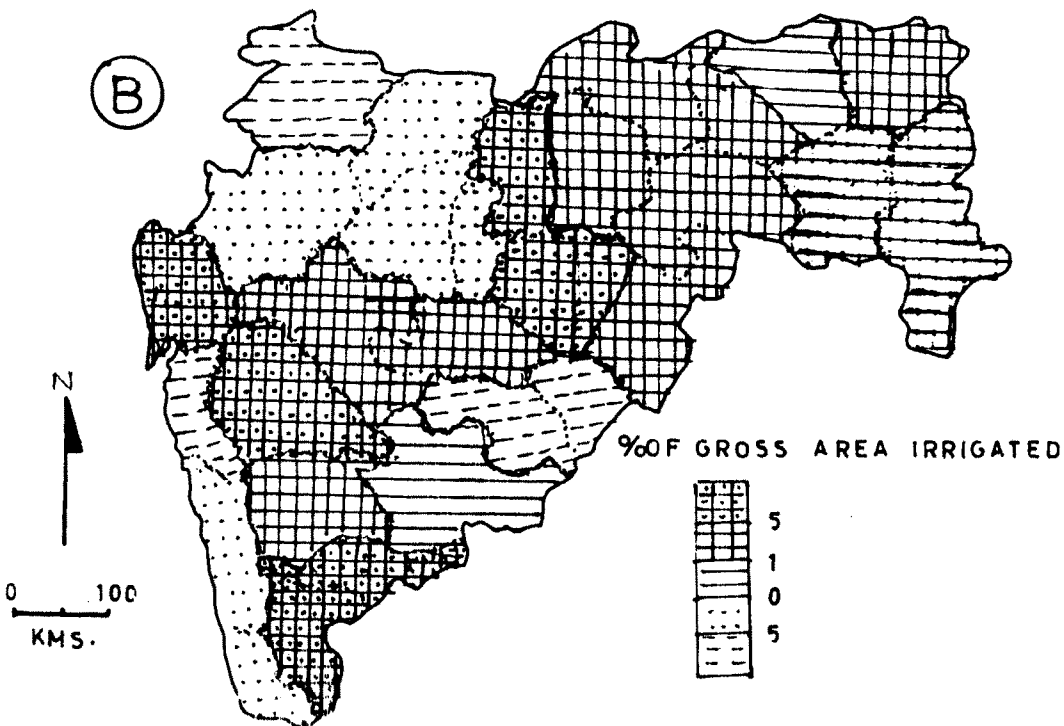


FIG. 2.5

a) Regional Distribution (1980-83) : Above 20% of the irrigated area under this sources is noted in the districts of Kolhapur and Thane. Pune, Ratnagiri, Sindudurg, Sangli, district record 10 to 20%. The high proportion under this source is due to the hilly terrain of the districts which is suitable only for lift irrigation. The moderate percentage (5 to 10%) is observed in Satara, Raigad, Bhir, Parbhani, Buldhana, Amravati, Nagpur, Yeotmal districts and low percentage (1 to 5%) in Ahmednagar, Akola, Nanded, Vardha, Bhandara, Chandrapur, Gadchiroli, districts. Elsewhere the area under lift irrigation is very insignificant (Fig.2.5-A).

b) Volume of Change (1950-53 to 1980-83) : The positive change in area under lift irrigation (above 5%) is observed in the districts of Kolhapur, Sangli, Pune, Thane, Buldhana, Parbhani. While moderate increase (1 to 5%) is noted in the districts of Ahmednagar, Bhir, Akola, Amravati, Vardha, Yeotmal and Bhandara. Relatively low percentage increase (below 1%) under lift irrigation is observed in the districts of Solapur, Nagpur, Chandrapur, Gadchiroli (Fig. 2.5-B). The negative change (below 5%) of other sources of irrigation is noted in the districts of Ratnagiri, Sindudurg, Nasik, Jalgaon, Aurangabad, Jalna. Above 5% negative change is observed in the districts of Osmanabad, Latur, Dhule, Raigad. The negative change is recorded due to the rapid increase in the net area sown as compared to the increase of irrigated area by this sources in absolute terms.

2.3 THE INTENSITY OF IRRIGATION (1980-83) :

The intensity of irrigation (i.e. net area irrigated as percentage of net area sown) from all sources is 11.50% in Maharashtra. However, it differs considerably in different parts of the state (Fig.2.6). The prevailing physio-socio-economic conditions are responsible for existing regional imbalances in the development of irrigation.

High intensity of irrigation : The intensity of irrigation is relatively high (above 15%) in the western upland districts, namely Ahamednagar, Pune, Satara, Sangli and Kolhapur. These are the districts where lift irrigation and canal irrigation are developed significantly. The canal irrigation is developed by constructing the irrigation dams across the numerous rivers originating in Western Ghats and flowing towards east. Here canal and lift irrigation facilities are developed, because of moderate slope of land and availability of perennial sources of water. The high intensity of irrigation is also noted in eastern part of the state including the districts of Chandrapur and Bhandara, Nagpur, Gadchiroli and Wardha (Fig.2.4). The remarkable growth of lift irrigation in Kolhapur, Sangli, Satara, Pune, Ahamednagar districts (Fig.2.5) seems to be due to the availability of perennial sources of water from major rivers in the state. The development of Co-operative societies, encouragement and financial aid from Co-operative sugar factories, and innovative nature of farmers are also partly responsible for the development of lift irrigation.

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INTENSITY OF IRRIGATION

1980-83

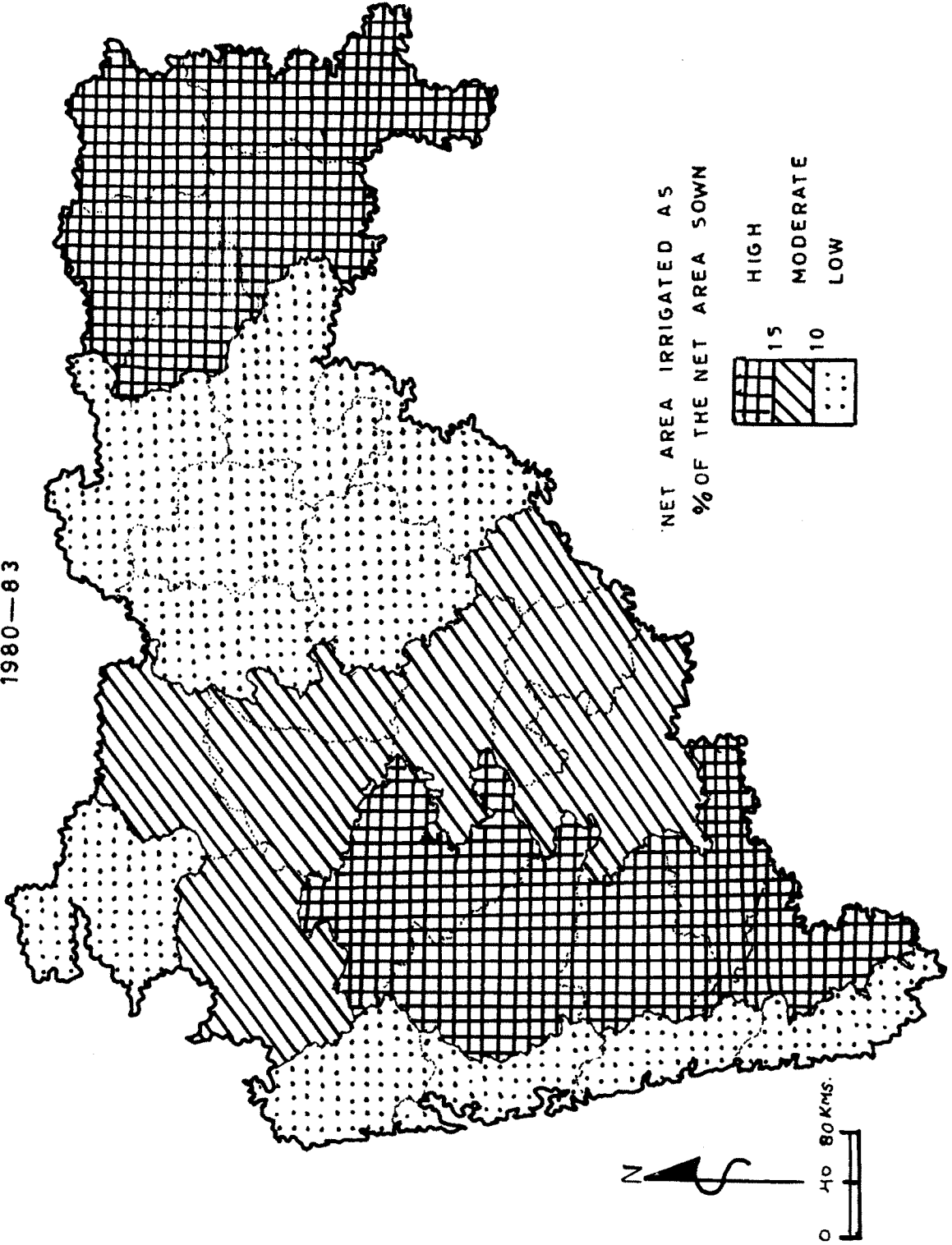


FIG. 2.6

In the eastern part of the Vidarbha (e.g. Nagpur, Bhandara, Chandrapur, Vardha districts) where traditionally tank irrigation is dominant due to the suitability of topography for the construction of tanks. Most of tanks were constructed during the British period.

The Moderate Intensity of Irrigation : Moderate intensity of irrigation (10 to 15%) prevails in the central zone of Maharashtra covering the districts of Nasik, Jalgaon, Aurangabad, Jalna, Bhir, Solapur, Osmanabad and Latur. This is a drought-prone area where need of irrigation is high. The well irrigation is the major source of irrigation in this part of state.

Low Intensity of Irrigation : Low intensity of irrigation (below 10%) is noted in the littoral districts of Maharashtra viz. Thane, Raigad, Ratnagiri, Sindudurg. It is also observed in western parts of Vidarbha region (Buldhana, Akola, Amravati, Nanded, Yeotmal, Parbhani, districts - Fig.2.6). This may be attributed to relatively less need of irrigation in the western part of the state and less development of water resources in the Vidarbha region.

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