CHAPTER - V

PROBLEMS OF IRRIGATED FARMING

5.1 INTRODUCTION

5.2 INADEQUATE INFRASTRUCTURAL FACILITIES

5.3 EXCESSIVE DOSES OF FERTILIZERS

5.4 AREA AFFECTED BY WATER-LOGGING, SOIL SALINITY AND ALKALINITY

5.1 INTRODUCTION :

In the fourth chapter an attempt was made to know how far developed irrigation facilities has led to change the cropping pattern and agricultural productivity in the region. It is observed that irrigation plays an important role in the increased production of agriculture commodities. However, over use of irrigation water culiminate in some lands going out of cultivation, as a result of water logging and salt accumulation. This may be due to the inadequate infrastructure facilities, absence of drainage and lined canals, application of excessive doses of fertilisers and pesticides, etc. Hence present chapter aims to highlight some of the problems given as below.

5.2 INADEQUATE INFRASTRUCTURAL FACILITIES :

In the modern agriculture involving high yielding varieties of crop fertilisers, insecticides and mechanised farm equipment requires a good rural road network upto the farms. The easily available credit facilities and good marketing facilities are also needed to get fare prices for the farmer's product.

The small size of holdings also affects adversly the scientific management of land, water and crop. Presently more than 50% of the operational holdings are smaller than one hectare in the state. In this regard the consolidation of land holdings and leveling of the land seems to be inevitable for the proper application of water. In some part of the state electricity is not yet made (80% of villages are electrified) available which is essential for lifting the water.

The agro-service centre which provide the basic input and related services to the peasents are also not widely spread in the state (Pawar, 1982).

Delay in the construction of canals and field channels, which has prevented the peasents to take water to their fields as soon as it become available. There is no certainly about the utilisation of the irrigation potential by the farmers. Whenever there is a good rainfall, cultivators harldly use irrigation water. But in years of scanty rainfall, all the cultivators rush to utilize irrigation water causing further scarcity. This leads to uneven distribution of water in the fields adversely affecting the productivity of crops.

In the surface irrigation, using distribution system consisting of main canals, branch canals, field channels etc; it has been estimated that 40 to 45% of the water entering the distributing system is being lost into the earth by percolation before reaching the field, and half of the water given to the fields is lost before it gets to the roots of the plants (Ministry of Co-operative and Community Development, Better use of land, 1964).

In some areas the farmers take only the rainfed crops as a result the newly created irrigation potential is not being fully utilised.

Medium and minor irrigation projects have not been able to show the desired results due to the inadequency of steel and cement and many of the tube wells have been reported to be working below

capacity or not working properly, due to want of electricity or fuel-oil for working the pumps.

Lack of advance planning in the distribution of improved seeds, fertilisers, and other inputs, lack of co-ordination between major and minor irrigation works, inadequate attention to drainage needs, inadequate attention to irrigation research on water requirement of crops on different soils, and the silting down of canals due to floods are other constraints in irrigated farming.

5.3 EXCESSIVE DOSES OF FERTILIZERS :

The fertilizers are applied to increase crop yields, it also increases water use efficiency. There is an intimate relationship between soil moisture and nutrient availability. Generally it is belived that greatest benefit from fertilizer application can be obtained under irrigation conditions. With adequate nutrient supply plants that are limited in growth due to moisture stress would have a higher content of mineral nutrients that plants under comparable fertility but not limited in growth by moisture supply.

The Nitrogen (N), Phosphorous (P) and Potassium (K) contents of the plants are appreciable higher under moisture stress, but the reverse relationship is observed for Calcium. Experimental evidence shows that for a given level of fertility, decrease in soil moisture supply is associated with definate increase in Nitrogen content of the plant tissue, a definite decrease in 'K' content and a variable effect upon content of 'P' 'Ca' and 'Mg'. When growth of plants

is limited due to soil moisture stress, nitrogen tends to accumulate within the plant because the rate of entry is approximately maintained in conjunction in growth processes. The 'K' content is relatively low as the rate of entry of 'K' decreases to a greater degree than does the rate of utilization in slower growing plants. Hence, the availability of 'K' may be depressed under stress conditions, depending on the nature of the soil. The effect of soil moisture on 'P' nutrition is far less consistent than for 'N' or 'K'. The increase in yield by increasing soil fertility under a given soil and water regime depends on the fertility level of the soil and the capability of the crop to produce additional dry matter under the prevailing circumstances. Crop yield may increase, decrease or remain unaffected by changes in the fertility level, depending on the magnitude of the change, the initial fertility level and the water supply. It is important to understand the effect on yield of the increasing the soil fertility, where the water supply is limited.

It is evident from Fig.5.1 that the trend of using the fertilizer is increasing since 1950-51. The consumption of 'N', 'P', 'K' during the year 1950-51 was 12,100 tonnes, 42,000 tonnes and 1,200 tonnes respectively. The significant increase in the consumption of 'N', 'P', 'K' is noted upto 291,400 tonnes, 123,100 tonnes and 91,100 tonnes respectively for the year 1984-85. As compared to the national average of fertilizers consumption the uses of fertilizers per hectare in Maharashtra is insignificant. However, the application of fertilizers are concentrated only to cash crops

FERTILIZER CONSUMPTION IN MAHARASHTRA

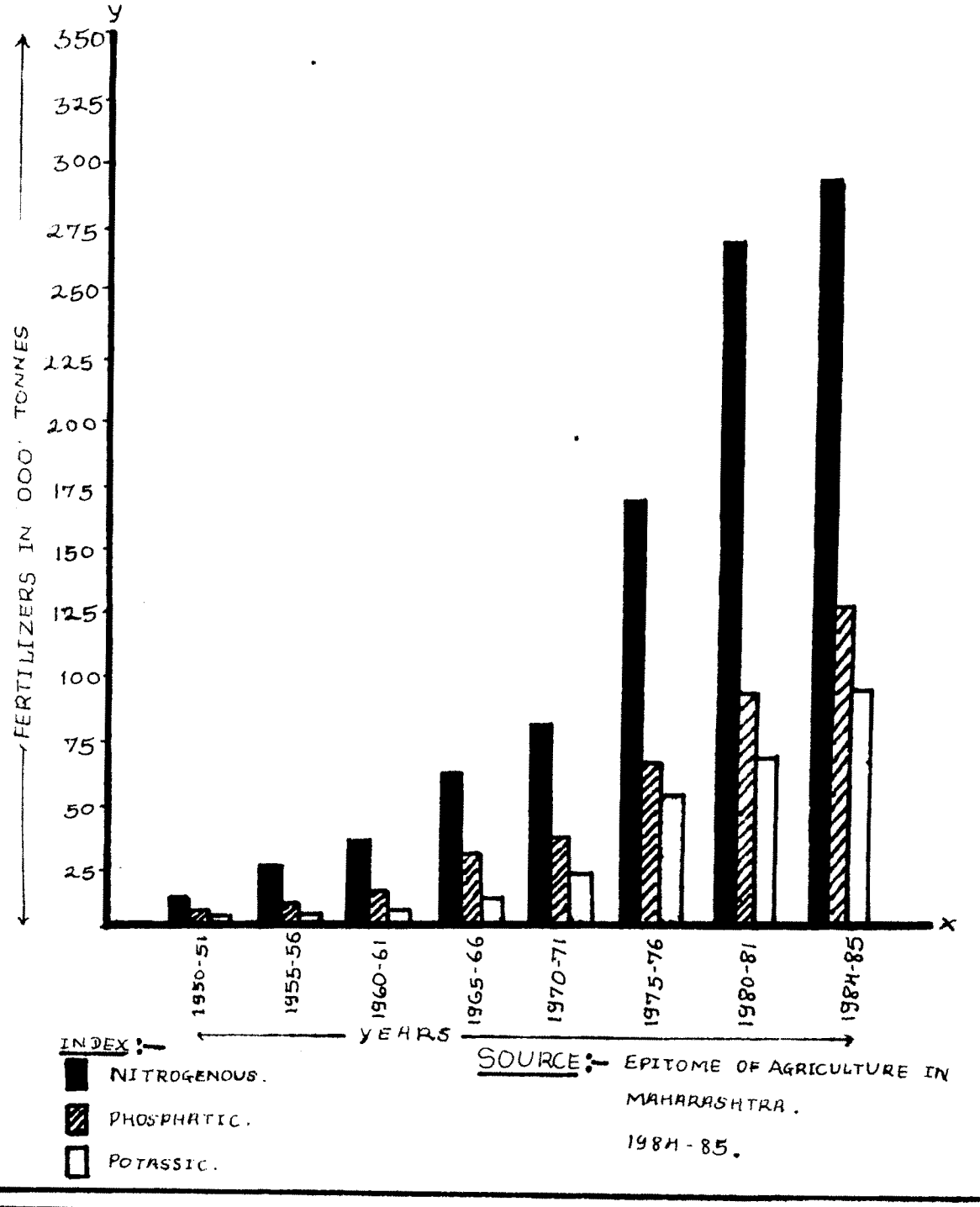


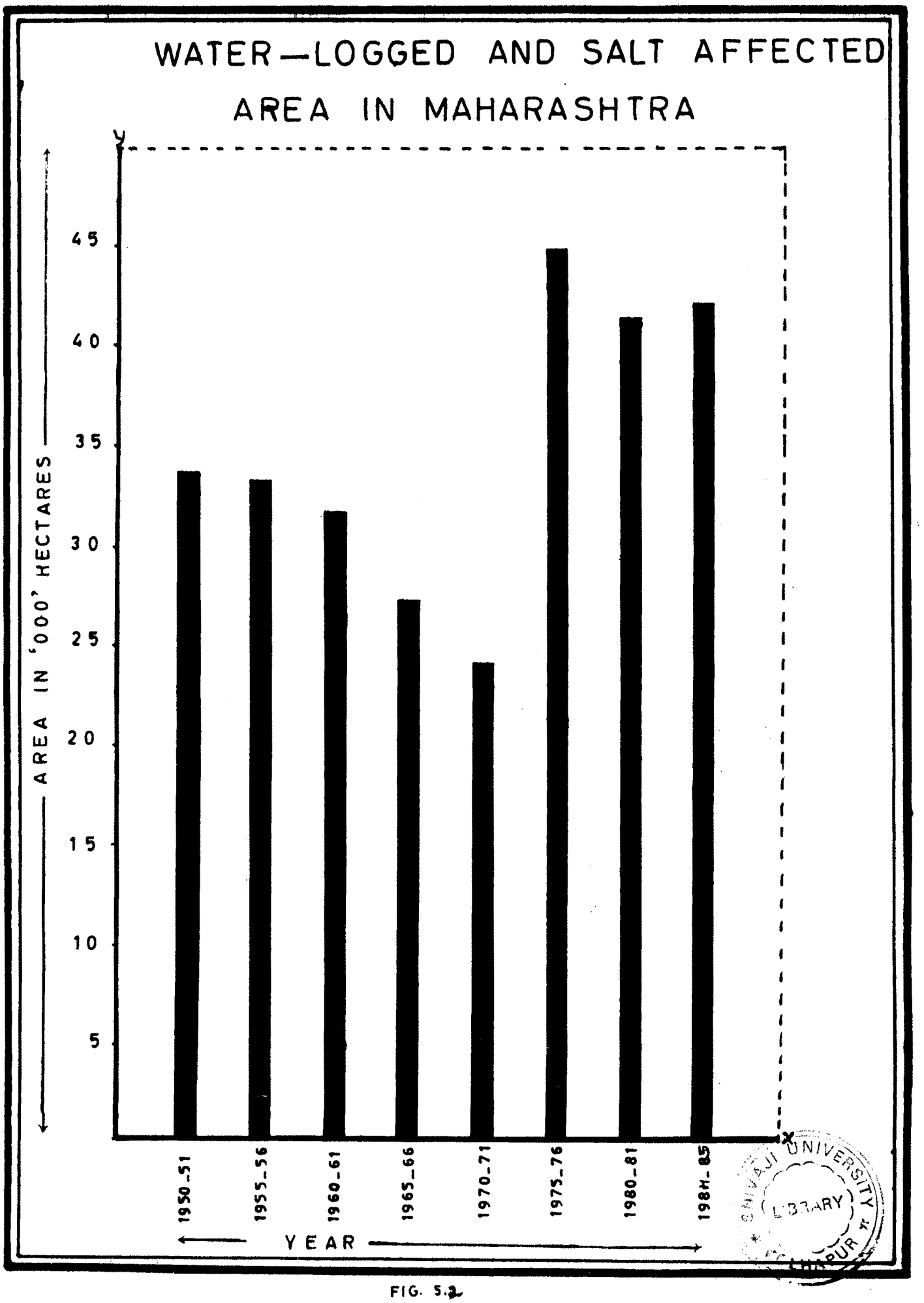
FIG. 5.1

like sugarcane, turmeric, ginger etc. Here the application of fertilizers is more than the requirement of crop. To maintain the high yield farmers apply heavy doses of fertilizers. As a result, the soils become saline and unproductive. In this regard the example of village Kasaba Digraj in South Maharashtra can be quotate where about 1,125 hectares of fertile lands earlier is rendered unproductive.

5.4 AREA AFFECTED BY WATER LOGGING, SOIL SALINITY AND ALKALINITY :

The empirical studies carried out reveal that the problem of water logging, soil salinity and alkalinity is mainly confined to the old canal system in the region. At present the area affected by salinization and alkalization is about 37,605 hectares in the state as a whole. Such lands are largely confined to the districts of Solapur, Sangli, Satara, Pune, Ahmednagar and Dhule. Fig.5.2, reveals the yearwise distribution of area thus affected since the year 1950-51. It is evident that in the year 1950-51, the area thus affected was 33,750 hectares, which declined to 23,500 hectares in the year 1970-71. This decline can be attributed to the special measures taken by state government and by individuals also. However after 1970-71 the area thus affected has shown increasing trend. It is observed that during the year 1984-85, about 42.450 hectares of land is being affected by salinazition and water logging. This is because additional land has been brought under irrigation by constructing new irrigation projects.

The projectwise area affected differs much, however the details regarding affected area by saline and alkaline soils is



SHIVAJI UNIVERSITY LIBRARY KOLHAPUR

FIG. 5.2

reviewed below, by taking 'Krishna Basin' as a sample.

The Krishna Basin

Krishna Basin constitutes an area of about 242,198 hectares. It includes rivers like Bhima, Nira, Ghod, and Mutha etc. Presently about 23,405 hectares of soil is affected by water-logging and salinity. The projectwise and canalwise distribution of area affected is described below.

1) The Krishna Canal : The Krishna canal was constructed during the year 1875 on the Krishna river at Khodashi village near Karad. Today there is almost 10,706 hectares soil which is benifited by this canal. Fig.5.3, indicates the variation in the affected area under Krishna canal during 1950-51 to 1984-85.

The affected area under this canal during 1950-51 was 6,641 hectares which has declined upto 4,540 hectares in the year 1984-85. It seems that the area thus affected was reduced by 2,101 hectares during the period under investigation. It is largely due to the preventive measures adopted by government and by private sectors.

2) Nira Right and Left Bank Canals : About 137,940 hectares of soil was brought under canal irrigation in 1929 after digging canals on right (1929) and left (1885) banks of the river Nira.

Under the right bank canal of this project the area affected was 3,932 hectares during 1950-51 which has increased upto 6,263 hectares during the year 1984-85. In case of left bank canal it was 6,234 hectares during 1950-51, which has decreased upto 4,172 hectares during the year 1984-85. It is evident that during the

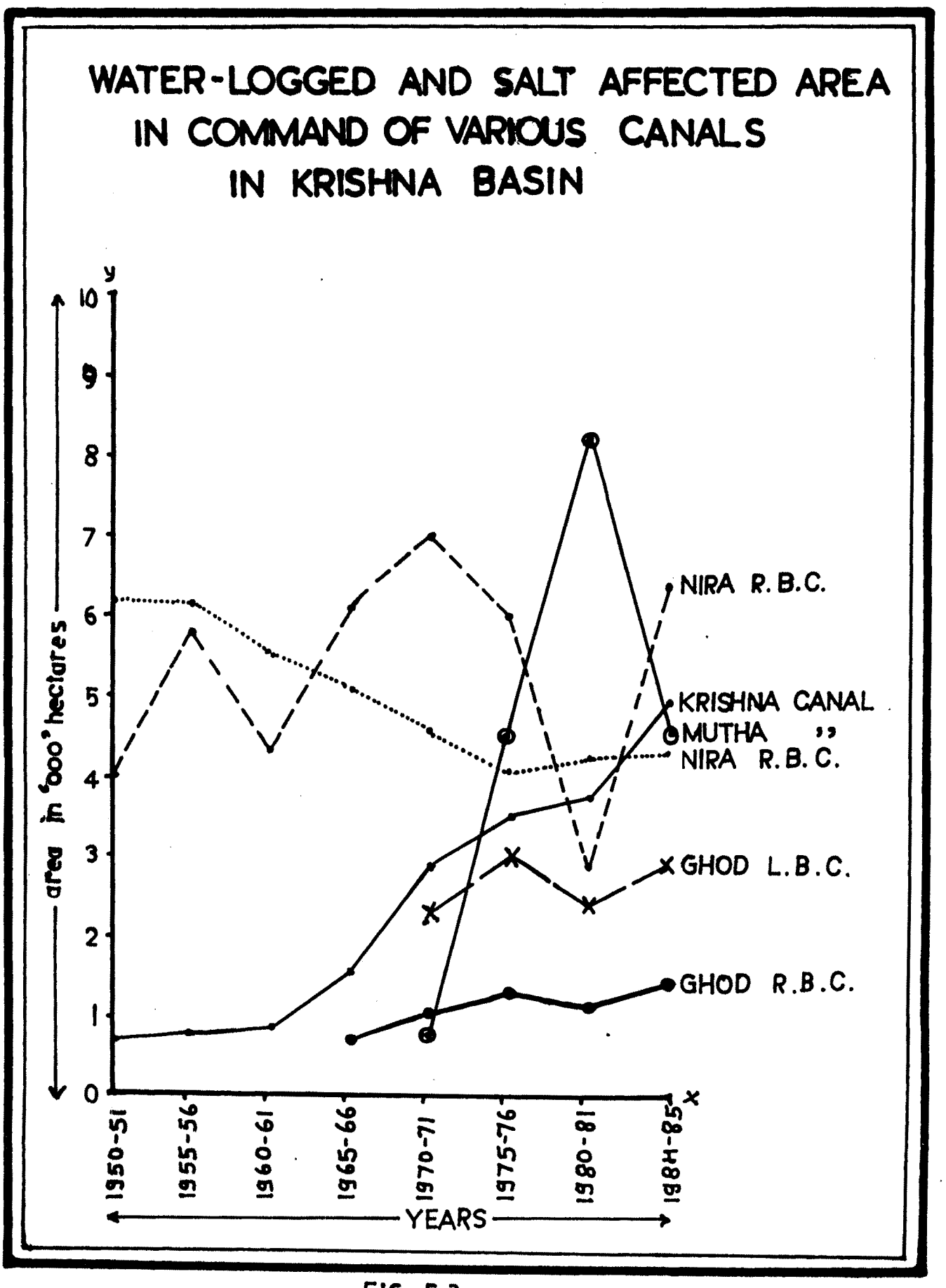

WATER-LOGGED AND SALT AFFECTED AREA
IN COMMAND OF VARIOUS CANALS
IN KRISHNA BASIN
area in '000' hectares
0
1
2
3
4
5
6
7
8
9
10
y
x
1950-51
1955-56
1960-61
1965-66
1970-71
1975-76
1980-81
1984-85
YEARS
NIRA R.B.C.
KRISHNA CANAL
MUTHA ,,
NIRA R.B.C.
GHOD L.B.C.
GHOD R.B.C.

FIG. 5.3

last three and half decades the area affected under these canals has increased.

3) Ghod Right and Left Bank Canals : Presently under these canals about 31,996 hectares of land is brought under irrigation in 1969 after digging canals on right and left bank of the river Ghod. Fig. 5.3, indicates the area affected by these canals.

Under the right bank canal of this projects the area affected was 613 hectares during 1968-69, which has increased by 584 hectares during the period under study. Whereas in case of left bank canal it was 1,786 hectares during 1968-69 and has increased by 1,040 hectares in 1984-85.

It is evident that during the last one and half decades the area affected under these canals has increased by 706 hectares. This increase in the affected area may be due to the overuse of irrigation water, fertilizers and non-rotation system of crops practised.

4) The New Mutha Canals : Mutha Dam was constructed during the year 1971-72 on the river Mutha. Today there is almost 61,356 hectares of soil which is brought under canal. The affected area under this canal during 1971-72 was 759 hectares has increased 8,148 hectares during 1984-85. The affected area by 7,389 hectares during last decade. This can be well attributed to the misuse of water, over use of fertilizers and non rotation system of crops.

In the recent years in Maharashtra attempts have been made both by public and private sectors to bring the water logged and salt affected area under cultivation. State Government has also opened separate 'Irrigation Research Centre' in 1961, to bring water

affected area in use. The result is that ratio of affected area is declining. The ultimate solution seems to lie in creating awareness among the farmers regarding the present burning problem of irrigated farming.

Besides, there are many other problems faced by individual farmers. So far as the well irrigation is concerned, seasonal fluctuation of watertable, technical faults in pump sets and failure of electricity at peak period affect adversely the crop yield.

REFERENCES

1. Govt. of Maharashtra (1985) : Directorate of Irrigation Research and Development, Pune. Annual Report (Part II).

2. Pawar,C.T. (1982) : Problems of irrigated farming in India. Paper presented at National Seminar on Irrigated Farming in India, organised by Department of Geography, Shivaji University, Kolhapur.

3. Sahasrabudhe, Deshpande, Kibe, Joshi and Zende (1969) : Broad Soil Zones of Maharashtra, Research Bulletin-21. Soil conservation series-9, Department of Agriculture, Maharashtra State, Poona. pp.127-128.

4. Zende,G.K. (1968) : Improvement of Saline and Alkali Soils in Maharashtra State, Poona. pp.3-4.

oOo