CHAPTER - IV

AGRICULTURAL PRODUCTIVITY

4.1 INTRODUCTION :

In the previous chapter an attempt was made to highlight the irrigated cropping pattern and changes therein. The present chapter aims to assess how far irrigation has led to the rationalization of agriculture. Rationalization literally means to explain the reasons or logic behind the development of agricultural activities.

Study of agricultural productivity is particular importance in a state like Maharashtra where food problem is acute and horizontal expansion of agriculture has almost reached its maximum physical limits. Agricultural productivity is the level of existing performance of a unit of land which differentiates from one area to another (Mohammad Ali,1978). It is the reflection of combined effect of various factors like physical, economical, social, technological, organizational etc.

While assessing agricultural development in a spatial perspective one should proceed to interpret the regional imbalances in the levels of agricultural productivity per unit area of different crops. Finally a combined overall picture of selected crops is also necessary as it well help in the delimitation of agricultural production, typologies and weaker areas.

Many agricultural geographers have attempted to study the agricultural productivity. L.D.Stamp (1943) determined the agricultural productivity on global scale by selecting a number of countries and some major crops. The areal units were graded

in ranking order according to their out-put per unit of area and ranking co-efficients were derived. M.Shafi (1960) applied this technique in determining the agricultural productivity of Uttar Pradesh. Buck,J.L. (1937), Clark and Hawell (1967) measured the agricultural productivity in terms of grain equivalants per head of population. Sapre and Deshpande (1964), and Bhatia (1967) used weighted average out put per unit. Majid Hussain (1979) measured agricultural productivity in terms of money value, (Shinde, Jadhav and Pawar,-1978) have also applied this techniques to measure the productivity of Maharashtra Plateau. (Jasbir Shingh et al., 1981) recently applied a techniques known as 'The crop-yield and concentration indices ranking co-efficient.

4.2 METHOD USED :

For measuring the agricultural productivity the following method viz. "computing the crop yield and concentration indices ranking co-efficient" has assessed the regional differences in the levels of food production and tried to delimit the weaker areas from the point of view of agricultural production which is enough to focus attention only on the important food crops of a region. The average food crop yields and proportions of these crops in the total harvested area have been used as twin elements for measuring the index of the levels of food production. For an objective measurement of the level of agricultural productivity, the relative crop yield and concentration indices arranged in ranking order and computed average ranking co-efficient would

give a measure which may be called the crop yield and concentration indices ranking co-efficient (Jasbir Singh and Dhillion S.S., -1984).

This method is found superior as it gives due weightage to the yield index and crop concentration index and their ranking for various crops. It is as below.

$$\text{i)} \quad Yi = \frac{yae}{Yar} \times 100$$

Where : Yi = is the crop yield index

Yae = is the average yield per hectare of crop 'a' in the component enumeration unit

Yar = is the average yield of 'a' in the entire region

$$\text{ii)} \quad Ci = \frac{pae}{par} \times 100$$

Where : Ci = is the crop concentration index

pae = is the percentage strength of the crop 'a' in the total harvested area in the component enumeration unit.

par = is the percentage strength of crop 'a' in the total harvested area in the entire region or state

The crop yield and concentration indices thus derived for all the regional units and the crops are ranked separately. Yield and concentration ranks for individual crops are added and thereafter divided by two; thus giving the crop yield and concentration indices ranking co-efficient. The equation is :-

iii) Crop yield and concentration indices ranking co-efficient for crop 'a' = $\frac{\text{Crop yield index ranking of crop 'a'} + \text{Crop concentration index ranking of crop 'a'}}{2}$

The results thus derived will give us an idea of the level of agricultural productivity. The lower the ranking co-efficient, higher the level of agricultural productivity, and vice-versa.

4.3 AGRICULTURE PRODUCTIVITY :

In the study of productivity pattern it is of interest to know the general area where different crops dominate and their contribution in agricultural productivity. For this purpose only a few of the important crops (rice, wheat, jowar, sugarcane and groundnut) have been selected for detailed analysis. These crops are grown in various parts of the region in different combinations and they contribute significantly to the agricultural productivity of the region. The areal distribution and yields of these crops bring out the regional dominance of individual crop.

1) Rice : The spatial pattern of rice productivity is shown in Fig.4.1-A. The western part of Konkan region particularly Thane, Raigad, Ratnagiri and Sindudurg have high (above 5) productivity. This can be attributed to relatively high rainfall and coastal alluvial soil where percentage under this crop is relatively high. The districts of Poona, Satara, Sangli, Kolhapur along with eastern districts of the state

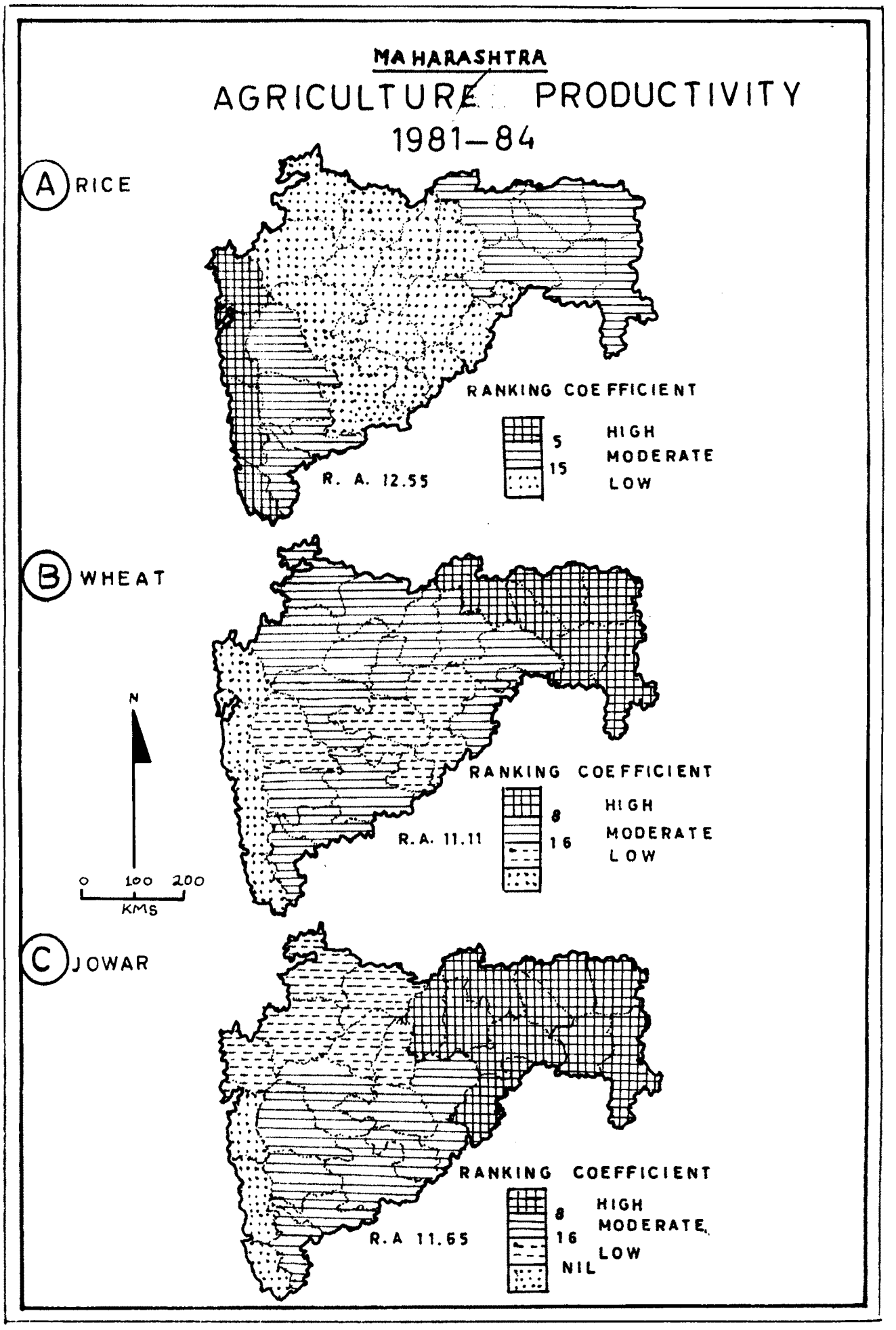
MAHARASHTRA
AGRICULTURE PRODUCTIVITY
1981–84
A RICE
RANKING COEFFICIENT
5
15
HIGH
MODERATE
LOW
R. A. 12.55
B WHEAT
N
0 100 200
KMS
RANKING COEFFICIENT
8
16
HIGH
MODERATE
LOW
R.A. 11.11
C JOWAR
RANKING COEFFICIENT
8
16
NIL
HIGH
MODERATE
LOW
R.A 11.65

FIG. 4.1

have moderate (5 to 15) productivity, where canal and tank irrigation facilities are developed and coarse soils on hilly slopes and clayloams in valley region are devoted for this crops. Whereas low (below 15) productivity is observed in central upland districts, where low rainfall and medium black and deep black soils; from traps cover by far the largest area of the Maharashtra. Here the proportion of cultivated area is relatively very low.

2) Wheat : The spatial pattern of wheat productivity dipicted in Fig.4.1-B, reveals that high (above 8) productivity of wheat is confined to the eastern part of the state. Whereas low (below 16) productivity is recorded in the districts of Pune, Osmanabad, Latur, Bhir and Parbhani. In most of the districts in the state, except littoral Maharashtra, the productivity is moderate (8 to 16).

3) Jowar : Fig.4.1-C reveals the spatial pattern of productivity of jowar in the state. Most of the districts from Vidarbha region (except Chanda, Bhandara and Gadchiroli) have recorded high (above 8) productivity of jowar whereas the south central and eastern part of the state (particularly - Pune, Satara, Sangli, Kolhapur, Ahmednagar, Bhir, Parbhani, Solapur, Osmanabad, Latur, Bhandara, Chandrapur and Gadchiroli districts) have noted the moderate (8 to 16) productivity of the jowar. The low (below 16) productivity of jowar is confined to the western part of the state.

4) Sugarcane : The distribution pattern of productivity of sugarcane is plotted in the Fig.4.2-A. The districts of Aurangabad, Pune, Sangli, Satara, Kolhapur, Nasik, Solapur, Osmanabad, Latur have high (above 8) productivity of sugarcane which is due to irrigation facilities, establishment of sugar factories and modern technology adopted by the farmers. Aurangabad, Jalna, Bhir, Parbhani, Nanded, Dhule, Amravati, Bhandara, Chandrapur, Gadchiroli, districts have moderate (8 to 16) productivity of sugarcane. Whereas the Konkan districts along with Jalgaon, Buldhana, Akola, Yeotmal, Vardha, Nagpur, districts reflects low (below 16) productivity of sugarcane. This may be attributed to various factors such as poor soil, lack of irrigation facilities, scarcity conditions and high frequency of droughts.

5) Groundnut : The distribution pattern of productivity of groundnut plotted in the Fig.4.2-B, reveals that the districts of Kolhapur, Sangli, Satara, Solapur, Osmanabad, Latur, Bhir, Nanded have high (above 10) productivity of groundnut. Dhule Jalgaon, Aurangabad, Jalna, Parbhani, Akola, Yeotmal, Vardha, Nagpur, Bhandara districts indicate moderate (10 to 15) productivity. Elsewhere the produces of groundnut is insignificant.

4.4 OVERALL AGRICULTURE PRODUCTIVITY (1981-84) :

After dealing with cropwise agricultural productivity here an attempt is made to find out overall agricultural

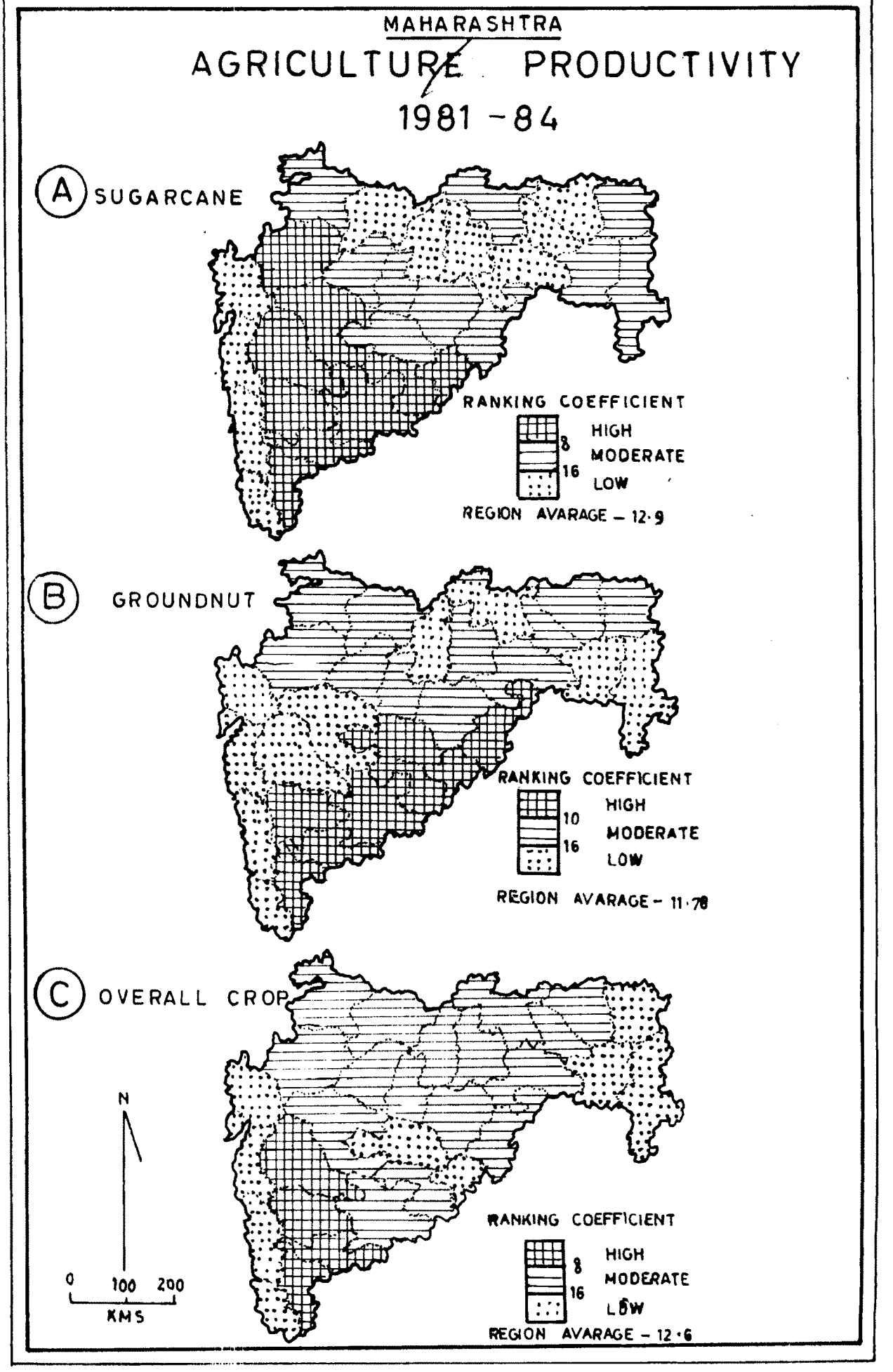
MAHARASHTRA
AGRICULTURE PRODUCTIVITY
1981 - 84
A SUGARCANE
RANKING COEFFICIENT
8 HIGH
MODERATE
16 LOW
REGION AVARAGE - 12·9
B GROUNDNUT
RANKING COEFFICIENT
10 HIGH
MODERATE
16 LOW
REGION AVARAGE - 11·78
C OVERALL CROP
N
0 100 200
KMS
RANKING COEFFICIENT
8 HIGH
MODERATE
16 LOW
REGION AVARAGE - 12·6

FIG. 4.2

productivity in the state by aggregating the productivity of all crops. The values are computed thus and depicted in Fig.4.2-C, reveals three distinct zones at once.

i) High Productivity :

The belt of the high agricultural productivity is observed in south central part of the state covering the districts of Pune, Satara, Sangli, Kolhapur. Here the sugarcane, rice, jowar, groundnut, are the important crops grown. This region is drained by river Krishna, and Bhima, where irrigation facilities are also developed (Fig.3.8). The fertile soil and adoption of modern technology application of fertilizers and convervative nature of farmers are some of the other factors which lead to augment yield per unit area. It is also evident by the productivity studies based on out-turn in terms of money (Shinde, et al.,1978) that these are the districts which have reported highest productivity of the state.

ii) Moderate productivity :

Central part of the state covering most of the districts of Vidarbha and Marathwada region along with some districts of western upland of Maharashtra (Fig.4.2-C) have reported moderate productivity. These are the districts where development of irrigation facilities are also moderate.

iii) Low productivity : The low productivity of agriculture is noted in littoral part of Maharashtra, and in Vidarbha districts of Chandrapur, Bhandara, and Gadchiroli. The Bhir and Latur

districts from Marathwada are also included in this category. This can be attributed to poor soil and adverse physical factors limiting the cultivation. The poor development of irrigation is also partly responsible for the low productivity of agriculture in these districts of the state. Thus, the analysis reveals that the cropwise agricultural productivity and aggragate productivity in the state is largely influenced by the availability of irrigation facilities, fertility of the soil and landuse in particular district.

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