CHAPTER - 7.

- SUMMARY, CONCLUSION AND SUGGESTIONS -
7.1 SUMMARY

The economy of Madhya Pradesh is predominantly agrarian and rural in nature. Agriculture is the backbone of the economy of the state. Madhya Pradesh is remarkably rich in potential for economic development but how best, it could be utilized is a matter of debate.

The state despite being a major food grain producer is one of the poorest state. The reasons are obvious but complex. Lack of means and motivation to adopt improved techniques of farming appears to be the dominating factor. Rice is one of the major food crops in the state. In the year 1989-90, the state accounts for about 12 percent of the total area under rice in the country, but it hardly contributes 6 percent to the country's rice production. This is, perhaps, due to low yield rate of rice crop in the state. Rice has the largest proportion of the gross cropped area in the state. Though rice is cultivated in almost all the districts of the state of which eleven districts viz, Raipur, Durg, Rajnandgaon, Bastar, Bilaspur, Raigarh, Sarguja, Jabalpur, Balla- ghat, Mandla, and Shahdol are the main rice producing districts included in the study. These districts account for about 85 percent of total production and 88.6 percent of total area under rice.

For attaining a higher growth in rice production, it is very important that rice grower in different districts are able to achieve better yields in a uniform manner. It is therefore essential to study the performance of rice producing districts in the state for taking remedial measures to boost the production of this crop.
The specified objectives of the study are:

1. To find out trends in area, productivity and production of rice crop for major rice producing districts of Madhya Pradesh.

2. To examine the factors responsible for uneven growth of rice in the state and

3. To suggest measures for improving rice yield in the state.

The hypothesis framed for the study are:

1. Increasing production is due to expansion in acreage.

2. Increasing productivity is due to application of HYV seeds and

3. Yield is directly affected by rainfall in the particular year.

The study is based on secondary data. The relevant data are collected from the publications of Government of Madhya Pradesh. To study the trend pattern and impact of different variables on production and per hectare yield of rice, various statistical techniques have been used i.e. exponential growth rates, index numbers, graphical analysis, multi variate linear regression and zero order correlation matrix.

Compound growth rates of area, yield and production of rice during the first, second and third period i.e. 1967-68 to 1988-89, 1967-68 to 1977-78 and 1978-79 to 1988-89 were worked out. During the entire period of study production of rice in the state reordered a positive growth rate of 1.84 percent per annum. Although the yield of rice crop in the state showed a growth rate of 1.01 percent per annum. On examining the growth
rates for individual districts it is clear that the rate of growth of all the three variables area, yield and production is not found significant in any of the major rice producing district except Rajnandgaon where the growth rate of production is found 3.54 percent per annum.

We have divided the data of twenty two years into two sub-parts 1967-68 to 1977-78 (first spell of 11 years) and 1978-79 to 1988-89 (Second spell of 11 years). Comparison of the growth rates of area in various districts for the first period shows that the growth rates of area has been distinctly lower and in fact negative in Durg, Raigarh and Jabalpur district. In consequence the growth rates of production has also been of a lower order in these districts.

In the second spell (third period) production of rice has significantly increased in Raipur, Durg, Bilaspur, Raigarh, Sarguja and Shahdol district and also in Madhya Pradesh as a whole. But area under rice did not increase significantly in these districts. Production of rice has increased mainly due to increase in the yield rate. Thus even if in some of the rice producing districts the scope for increasing area under rice is negligible, there is scope to increase the total production of rice by improving the yield levels.

Output variability is the net result of area variability and yield variability. Yield variability is largely influenced by weather. Area variability, on the other hand, is not only a function of rainfall at the time of sowing but is also influenced significantly by economic factors. The present study clearly reveals that coefficients of variation for production and productivity were quite high in almost all the districts in the
state for all the three periods. It shows that the high variability in production in all the selected rice producing districts of the state has occurred mostly due to the wide fluctuations in the yield rate, implying that the production of the crop can be stabilized only by improving the yield levels of rice.

In order to study the factors affecting rice production regression coefficients were worked out. It is obvious from the analysis that area and per hectare yield have a significant impact on production of rice in the state as a whole and also in major rice producing districts in the state. Our first hypothesis is accepted in case of production of rice.

To study the factors affecting per hectare yield of rice crop beta (b) coefficients were worked out and examined. The input factors considered were irrigated area under rice (x1), area under high yielding variety (x2) consumption of fertilizers (x3), rainfall (x4) cropping intensity (x5) and tractor intensity (x6). It is obvious from regression analysis that our second hypothesis regarding high yielding variety coverage gets rejected in all major rice producing districts and in the state as a whole. Impact of irrigated area is found statistically significant in Balaghat district. Cropping intensity is also a factor having significant impact on per hectare yield of rice in Raipur, Raigarh, Mandla and Shahdol district. Fertilizer consumption is also a major factor contributing yield in Raipur, Bilaspur, Mandla and Shahdol district. Impact of tractor intensity is found significant in Rajnandgaon, Jabalpur and Shahdol district. Our third hypothesis regarding rainfall is accepted in case of Bastar, Sarguja and Jabalpur district.
Correlation of different variables with each other is also examined with the help of zero order correlation matrix. Correlation matrix reveals that per hectare yield of rice is positively correlated with other explanatory variables. A high degree of positive correlation is found between irrigated area and consumption of fertilizers. On the other hand, rainfall and cropping intensity are negatively correlated with some explanatory variables included in the regression model.

7.2 CONCLUSIONS

For Madhya Pradesh as a whole the study reveals a growth rate of 1.84 percent in the annual production during the whole study period of twenty two years. At the district level, the growth rates of production is not found significant in most of the districts. The growth rates in production and productivity in most of the districts were distinctly lower in the first spell of eleven year as compared to second spell. Moreover, the output of rice was characterised by wide fluctuations from year to year due to uncertain yield level because of its dependence largely on erratic rainfall in the state. The regression analysis of the time series data at the district level revealed that area under rice and per hectare yield of rice combinedly explain 99 percent variations in total production. It is evident from $R^2$ values that irrigated area, area under ETVarieties, consumption of fertilizers, rainfall, cropping intensity and tractor intensity together accounted for 42 to 87 percent variations in the productivity of rice.

The state of Madhya Pradesh though predominantly an agrarian economy has been lagging far behind the national average in production and productivity of rice crop. In fact, the sluggish growth rate of rice is really a matter of serious con-
cern. In the state where nearly on fifth of the area is under
cultivation of rice and more than one fourth of the population is
dependent on production of rice the sluggish growth rates has
really not made any dent in the living standard of the population.
It is unfortunate even after forty four years of independence and
completion of seven five year plans the production of rice is
still dependent on the vagaries of nature.

7.3 SUGGESTIONS

We are all therefore very much concerned to
evoke suitable strategies to accelerate the growth of agricultural
production in general and rice in particular.

In Madhya Pradesh the ratio between the average
yield obtained by farmers and the yield of national demonstration
farms in irrigation paddy was 3:14. Thus even with the available
production technology there is scope for increasing the production
of rice through reducing the yield gap ratio of 1:2. The International
Rice Research Institute (I.R.R.I) in Philippine has been
designating the difference between an experiment station yield and
actual farm yield as yield gap and factors responsible for such
gap are known as yield constraints.

In respect of crop area this ratio can occur
vertically through increasing the intensity of cropping. Madhya
Pradesh is the largest state in Indian union having considerable
scope for an expansion of the cultivated area. Although with the
fast developing production technology no land is marginal land yet
the fact remains that for sometime to come these area would remain
low productivity land. However if special investment with regard
to the provision of water and development structure are made in a
rationally phased manner there is no reason why a major part of these land cannot be brought under cultivation.

Another way to raising farm productivity of rice is to increase the intensity of cropping. The average cropping intensity of rice in Madhya Pradesh was 129 in year 1988-89. In four major rice producing districts the intensity of cropping districts the intensity of cropping is less than the average of the state. On the other hand, efforts should be made to enhance their intensity of cropping to the average of the state, and also investment be stepped up for the expansion of the irrigation facilities so that the intensity of cropping is raised.

It would be necessary to extend the area under cultivation and also bring more area under irrigation either through flow or lift. This presupposes the role of government to a considerable extent especially in case of flow irrigation. In areas where lift irrigation could be under taken it would also be necessary to have a detailed account of ground water table which will have to be assessed by the Government agencies, it is also necessary to have provision for electricity in these areas at reasonable rates. What bank could do is extension of financial help for the execution of minor irrigation. i.e. lift irrigation projects. But this could be done provided the factors such as ground water table and electricity are ensured. Thus banks can only complement the work of government and it is the government that should initiate this development process.

With regards to increasing productivity of rice it is necessary to provide appropriate high yield variety of seeds to the farmers together with other input package at reasonable
prices. As is evident the high yielding varieties are more prone to pests and other disease, the treatment of which is so often costly, sometime impossible and beyond capacity of farmers. It is also observed that some marginal and small farmers still confine to traditional varieties rice even though they are fully aware of the fact that the high yielding varieties provide more output due to certain factors. Some farmers grow local varieties of paddy instead of HYV due to long straw which the local varieties has, on which their pair of bullocks survive. Thus the role of government in these areas is also very important not only for execution of the programmes but make them viable and sustaining.

The new technology is basically capital intensive and adoption of such technology calls for private investment in farm inputs as well as in fixed capital. No doubt there is great scope of raising rice production with the available credit facility, it may be remembered that credit is a necessary but not a sufficient condition for agricultural growth.

More over past experience has shown that by and large, multiplying the number of tiny holders on an individual basis seems to contribute neither to growth nor to equity and poverty eradication. The individual beneficiary of the plot through land distribution is too weak and too helpless to stand up on his own and turn in to a viable and self reliant cultivator.

We do possess many of the basic ingredients needed for the accelerated growth in rice production such as fertile land, abundance of rainfall, immense irrigation potentiality and above all hard-working farming community. What is now needed is a major thrust towards location specific researches which can stand uncertainty of rains and can give high returns in
water logging conditions, location specific knowledge on fertilizer response, resources for exploiting the tremendous untapped irrigation potentiality and adequate production credit to farmers.