METHODOLOGY
CHAPTER-IV:

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4.1 Significance of the study:

Due to the changes in agricultural technology, spread of education in rural area, increased awareness of the cultivators, intensive efforts of the Government agencies and introduction of high yielding varieties, the cropping pattern of any region is subject to change. Marathwada region also cannot be an exception to it. The present study is an attempt to study the nature, direction and extent of changes in the cropping pattern of this region.
"Concepts like "support prices to agricultural product", "Marketable surplus", "Consumption pattern of the society in general and cultivators in particular". "legal restrictions imposed by the Government on selection of certain crops". "Green revolution", "agricultural innovations", and "Changes in the agricultural technology" are very much in currency in recent years. Being a cultivator himself, the author of the present study strongly felt the necessity of finding out some common principle underlying all these problems and felt that all these issues were the offshoots of the crop selection decisions of the cultivators. In technical jargon, it can be said that they are either the cause or the effect of the cropping pattern of any region. It is felt that these issues can be taken up in right perspective only when the cropping pattern of that region is thoroughly understood. Thus, the present study is an attempt in that direction.

In spite of several efforts on the part of the Government, right from independence, we have been unsuccessful in providing the economic stability to the cultivators. The recent trend which is being observed is that, these cultivators have started coming on the roads in the form of agitations to press
for some of their demands, main being reasonable price for their produce. That has created a need to study their problems basically. Since most of their problems are based on the crops they select, such studies have posed a challenge to the researchers' community.

4.2 Objectives of this study:

The study is being undertaken keeping in view different objectives. Important of them are listed as follows:

a) to understand the term-cropping pattern and changes therein and to clarify various theoretical concepts associated with it.

b) to list the determinants of the cropping pattern and classify them in certain standard categories.

c) to peep into the micro studies undertaken by researchers for finding out the case and effect relationship between the determinants and pattern.

d) to understand the cropping pattern of each district of Marathwada and to locate the peculiarities of the pattern of these districts.
e) to evolve and understand the cropping pattern of the region as a whole and examine it in the light of the pattern of the State of Maharashtra and the country as a whole.

f) to locate the direction of change in the cropping pattern of this region over a time span.

g) to prepare a base for the future research plans—especially micro studies—pertaining to this region and to the selection of crops by the cultivators in this region.

h) to offer suggestions to the district and regional planning bodies in this region regarding future strategies in agricultural planning of the region in general and crop selection in particular.

i) to study the impact of rainfall, soil conditions and irrigation on the cropping pattern of the region.

j) to study the changes in the cropping pattern of this region and to study the possible effects of the same on the farming community as a whole.
4.3 **Issues framed:**

In the present study, it is proposed to frame the following issues:

1) Has the cropping pattern in Marathwada really changed? If it has changed, what is the extent of change?

2) What is the direction of change in the cropping pattern of this region? Has it shifted from inferior pattern to superior one or vice versa?

3) What are the crops gaining the ground? At whose cost they are gaining? What must be the possible reason for this replacement?

4) Is the cropping pattern of each district the same? If not, what are the interdistrict variations? Are there interdistrict similarities or dissimilarities?

5) Is the cropping pattern of Marathwada similar to that of Maharashtra State? If not, what are the points of difference? What must be the possible reasons for the difference, if any?

6) Is there any similarity between the cropping pattern of this region, state and the Country as a whole?
7) Have the cultivators from this region come out of the famous and traditional food/ fodder/ cash cropping pattern?

8) If the crops are divided in certain groups like cereals, pulses, oil seeds and other cash crops, is the change in this pattern within the groups of crops or between the groups?

9) Is the cropping pattern of this region centralised or diversified?

10) Are the cultivators in this region successful in removing agriculture from the clutches of Nature? Or to put it the other way: Is the cropping pattern of this region still circumscribed by Natural factors like rainfall, climate etc.?

4.4 Why the study of a region?

The study confines itself to a region which covers five ** districts of Marathwada. Marathwada maintains its identity in the political, socio-economic and geographical map of Maharashtra State. Before 1956, it was a part of erstwhile, Hyderabad state and while reorganising the states in the country, this region was

** The study pertains to 1961-75. During this period this region was divided in five districts only viz. Aurangabad, Beed/Parbhani/Nanded, Osmanabad, Jalna & Latur districts came into being after that period. Hence this study is said to have covered only five districts.
adjuncted to Maharashtra State. If compared with other regions in the State, it can very well be said that this region is lagging behind the Maharashtra State in most of the economic aspects. All the five districts of this region have been identified by the Planning Commission as backward districts. That gives a researcher an opportunity to compare its cropping pattern with the rest of the regions to find out the points of similarities and dis-similarities in the same.

4.5 Period chosen for study:

As stated in the earlier part of the study, changes in the cropping pattern can be observed over a longer span of time. Time of longer span has to be observed and analysed to understand the extent and direction of the changes in the cropping pattern. The term "longer span" needs proper definition. Does this longer span mean several years? The answer is emphatic 'No'. The demarcating line between short period and long period is very flimsy as it depends upon the nature of data. Gupta rightly points out that "As a minimum safeguard, it may be said that to compute trend, the period must cover at least two to three complete cycles." One agricultural cycle is said to
last for a period of five years. Hence data for 15 years can safely be treated as adequate for the present study. Considering this feature of the study, the sources of secondary data were approached and it was observed that data useful for the present study was available from 1961 onwards up to 1975. Efforts were made to collect data for even after 1975 but it was not available in the required quantum. As such, the study is limited to a period of 15 years. That way, this span is quite sufficient to observe long term tendencies revealed in the cropping pattern.

4.6 Heads on which data is collected:

Keeping in view the issues framed, data on following heads was collected.

a) Land utilisation statistics from 1961-62 to 1975-76 for the five districts of Marathwada.

b) Land acreage statistics—i.e. land under different crops for the same period.

c) Yield statistics pertaining to important crops cultivated in this region for 15 years.
d) Average yield statistics of the crops were found out on the basis of information collected under the head (b) and (c) stated above.

e) Average rainfall statistics calculated on the basis of rainfall figures from 1901 to 1950 and monthly rainfall statistics of important rain gauge centres in Marathwada from 1961-62 to 1980-81.

f) Statistics pertaining to irrigation potential and irrigation made available to different crops cultivated in the region.

ge) Crop statistics for the state of Maharashtra and the whole country for selected years.

4.7 Sources of data:

Since the study is exploratory in character and since it is limited to some of the macro cropping pattern determinants, collection of primary data was not necessary for the study. That is why only secondary sources were tapped for the collection of statistical information. Main sources from where the data was collected are listed as follows:
a) District statistical abstracts published by the Government of Maharashtra for each district. These abstracts were available in the District Statistical Office.

b) Rainfall statistics for the period 1961-80 were obtained from Pune observatory where data are collected continuously from all the rain gauge centres.

c) Data pertaining to national cropping pattern was collected from India Reference Annuals.

4.3 Reliability of data collected:

As would be revealed from the sources from which the information is collected, most of the information comes from Government publications and departments. In fact, that is the only source from where this information comes forth. This information is mostly collected by the Revenue Department of the Government of Maharashtra. It is compiled at Tahsil, District, Region and State level and published regularly by the Government.

The basic person who is at the key position
of the collection of this data is *talathi* or *patwari* appointed by the Government for a small group of villages. During the course of his regular duties, he is expected to collect this statistical information. Considering his academic level, he is not aware of the importance and future use of the information collected by him. As a result, some irregularities slowly creep in the procedure of collection of data.\(^6\)

The collected information is compiled at every higher level without any mechanical aid and some error is likely to creep in the compilation work also. Besides, the speed of compilation cannot be increased due to human limitations. As a result, the results are declared at the state level very late. Thus, despite several efforts, up-to-date data could not come forth and information up to 1975 only had to be considered for analysis.

In spite of these limitations, since there was no other source* from where this secondary data could be available, the information had to be relied upon for the present study. Since the present study intends to find and trace the trends in cropping pattern, some degree of accuracy can be sacrificed
and meaningful conclusions can be reached even with the data available.

4.9 **Statistical tools used in the study**:  

Various statistical tools are used at different levels of study in the present project. These tools are listed as follows:

a) **Tables**: Tables are said to be simple statistical tools used for presentation and comparison. Since the present study is based on time and spatial comparisons, tables have proved to be of immense help in bringing home the points of comparisons very clearly. Absolute as well as relative quantities are presented at different places of study considering the utility of those particular quantities in given situation. Some tables are restructured, represented in modified forms wherever necessary to add to the utility of the information collected.

b) **Averages**: Since averages represent certain central tendencies, and since the present study is mostly based on revealing the long-term cropping tendencies, averages have been extensively used wherever necessary. Average area under a particular crop, average yield of any
particular crop are some of the situations where averages are profitably used. To avoid complications, simple, arithmetic averages only have been computed.

c) Standard deviation and coefficients of variation:

Study of the stability in the cropping pattern, stability in the area under different crops and their yields has also been undertaken here while studying the changes in the cropping pattern. For measuring the variability in these factors, tools like standard deviation and coefficients of variation also have been gainfully employed.

d) Co-efficient of correlation:

For establishing relationships in different variables, the tool of coefficients of correlation has also been used at very many places. Wherever qualitative analysis is involved rank correlation coefficients also have been used.

e) Regression coefficients:

No study of location of cropping trends can be satisfactorily done unless regression co-efficients are extensively used. For each series of use of land, acreage of crop, yield of crop, regression co-efficients
have been found out to know whether the crops are gaining significance or not. To avoid complications in the study, linear regression co-efficients only have been studied. Similarly, multidimensional regression studies (like multiple and partial) have also been avoided.

f) Miscellaneous statistical tools:

Besides the important statistical tools listed above, tools like graphs, diagrams, ratios, percentages, rates have also been used wherever essential.

4.10 Limitations of the study:

The author of the present study is aware of the following limitations of the project:

a) The study is more exploratory in character. As such, efforts have been made to compile available secondary information on the subject. To limit the unwieldy scope of the study, micro cropping determinants have been excluded from the project though the author fully realises that they are in no way less important to macro factors. In fact each cropping pattern determinant, if studied exhaustively, can itself become a complete research project.
b) The span of study could have been expanded 
upto 1980, had adequate statistical information been 
completely available up-to that period. But considering 
the availability of data and limited resources available 
at the disposal, there was no other go but to limit the 
study up-to 1975-76.

c) Thorough knowledge of agriculture, cropping systems, 
local practices followed by the cultivators, crop 
replacements, etc. is expected of a researcher 
undertaking a project on changes in the cropping 
pattern. Though the author is a commerce and economics 
student, efforts have been made to up-date the basic 
knowledge required for the study and some basic issues 
were thoroughly discussed with seasoned cultivators and 
the agriculture officers dealing with the subject proper.

4.11 Chapter scheme:

For the sake of convenience the study is 
divided in following chapters:

a) Cropping pattern: Its theoretical dimensions:

Before entering into the study proper, it 
was thought necessary to define the term "Cropping 
pattern". Besides the definitions, issued like objectives
of cropping pattern, ideal cropping pattern, types of cropping pattern, role of the Government in influencing the cropping pattern have also been discussed at length. Changes in the cropping pattern also needed to be defined. Tools measuring these changes together with their relative utility have also been discussed.

b) Cropping pattern determinants:

Cropping pattern of any region depends upon divergent factors. Various studies have been conducted by different researchers to identify their causes through micro studies. The relevant literature has been examined in this chapter to determine the relative importance of these factors influencing the cropping pattern. These factors have been studied under different groups like natural factors, economic factors, sociological factors, political factors and personal factors.

c) Historical sketch of the area under review:

To provide proper background for the study of the project under review, it is quite necessary to make a brief reference to the socio-economic and natural conditions prevalent in the region. Issues like geographical location, political
history, soil structure, rainfall, irrigation potential, land holdings, land utilisation, cropping seasons, and the crops which are normally cultivated here have been briefly discussed in this chapter. Similarly, reference has been made to the people living in this region.

d) **Methodology involved in the study:**

Methodology adopted in the study is discussed at length in this chapter. Objective and significance of the study, hypotheses to be tested, period chosen for study, statistical information collected, sources of data, different statistical tools used in the analysis together with the chapter scheme have been explained in the sequence stated above.

e) **Districtwise study of cropping pattern:**

Secondary data pertaining to each district have been separately examined in the chapter to locate the direction and extent of change. Land utilisation statistics, area statistics, yield statistics, average yield statistics, irrigation statistics, have been examined separately for each district and the specialities and peculiarities of each district have been identified in respect of its cropping pattern. Concepts like diversification of crops, crops gaining and losing
importance, relative importance of each crop in the
district, Kharif and Rabi distribution of crops have
also been made clear. Thus, the picture of each
district regarding its cropping pattern has been
presented here.

f) **Interdistrict and other comparisons:**

Comparative study of the five districts
is presented in this chapter to know the similarities
and dissimilarities existent in these districts. This
has been done to know whether a common cropping pattern
for the entire region could be thought of. Besides,
the cropping pattern of the region has been compared
with the cropping pattern of the state of Maharashtra and
that of the country as a whole to know where this region
stands in this respect.

g) **Conclusions and suggestions:**

The limitations of this study, that it
is macro and exploratory in character, have been made
very clear in the earlier part. As such, available
secondary data have been analysed and some useful
features of the cropping pattern have been noticed in
the course of study. They have been summed up in the
form of conclusions in this chapter. Besides, some
useful hints have been given at the end to the researchers who are interested in carrying the torch ahead by conducting micro studies in this respect.

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