Chapter III - Research Methodology
3.1 Introduction

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. Researchers not only need to know how to develop certain indices or tests, how to calculate the mean, the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not, and what would they mean and indicate and why. Researchers also need to understand the assumptions underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not. All this means that it is necessary for the researcher to design his methodology for his problem as the same may differ from problem to problem.
In research the scientist has to expose the research decisions to evaluation before they are implemented. He has to specify very clearly and precisely what decisions he selects and why he selects them so that they can be evaluated by others also. From what has been stated above, we can say that research methodology has many dimensions and research methods do constitute a part of the research methodology. The scope of research methodology is wider than that of research methods. Thus, when we talk of research methodology we not only talk of the research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others so that research results are capable of being evaluated either by the researcher himself or by others. Why a research study has been undertaken, how the research problem has been defined, in what way and why the hypothesis has been formulated, what data have been collected and what particular method has been adopted, why particular technique of analyzing data has been used and a host of similar other questions are usually answered when we talk of research methodology concerning a research problem or study.

3.2 Importance of Research Methodology:

The study of research methodology gives the student the necessary training in gathering material and arranging or card-indexing them, participation in the field
work when required, and also training in techniques for the collection of data appropriate to particular problems, in the use of statistics, questionnaires and controlled experimentation and in recording evidence, sorting it out and interpreting it. In fact, importance of knowing the methodology of research or how research is done stems from the following considerations:

(i) For one who is preparing himself for a career of carrying out research, the importance of knowing research methodology and research techniques is obvious since the same constitute the tools of his trade. The knowledge of methodology provides good training especially to the new research worker and enables him to do better research. It helps him to develop disciplined thinking or a 'bent of mind' to observe the field objectively. Hence, those aspiring for careerism in research must develop the skill of using research techniques and must thoroughly understand the logic behind them.

(ii) Knowledge of how to do research will inculcate the ability to evaluate and use research results with reasonable confidence. In other words, we can state that the knowledge of research methodology is helpful in various fields such as government or business administration, community development and social work where persons are increasingly called upon to evaluate and use research results for action.

(iii) When one knows how research is done, then one may have the satisfaction of acquiring a new intellectual tool which can become a way of looking at the world and
of judging every day experience. Accordingly, it enables us to make intelligent
decisions concerning problems facing us in practical life at different points of time.
Thus, the knowledge of research methodology provides tools to look at things in life
objectively.

(iv) In this scientific age, all of us are in many ways consumers of research results
and we can use them intelligently provided we are able to judge the adequacy of the
methods by which they have been obtained. The knowledge of methodology helps
the consumer of research results to evaluate them and enables him to take rational
decisions.

3.3 Components of Research Methodology

Before embarking on the details of research methodology and techniques, it seems
appropriate to present a brief overview of the research process. Research process
consists of series of actions or steps necessary to effectively carry out research and
the desired sequencing of these steps. At times, the first step determines the nature
of the last step to be undertaken. If subsequent procedures have not been taken into
account in the early stages, serious difficulties may arise which may even prevent
the completion of the study. One should remember that the various steps involved in
a research process are not mutually exclusive; nor are they separate and distinct.
They do not necessarily follow each other in any specific order and the researcher has to be constantly anticipating at each step in the research process the requirements of the subsequent steps. However, the following order concerning various steps provides a useful procedural guideline regarding the research process:

1. Formulating the research problem
2. Extensive literature survey
3. Developing the hypothesis
4. Preparing the research design
5. Determining sample design
6. Collecting the data
7. Execution of the project
8. Analysis of data
9. Hypothesis testing
10. Generalizations and interpretation
11. Preparation of the report or presentation of the results, i.e., formal write-up of conclusions reached.

3.4 Present Study

The present study is based on secondary data of GSDP of Chhattisgarh for the period 1993-2010. The first and foremost issue in any study of the long term trends is the choice
of an appropriate base year. So in the case of national accounts data which changes the base year which is a normal year and somewhere near the middle of the series. The data may be available with an old base year and it is needed to be converted into a series with new base year, or rather the data should have single base year. This is because the commodity composition and relevance of commodities may be changing over the time.

In the present study, a comparison has been done of the growth rates of GSDP of Chhattisgarh state with that of the Chhattisgarh region when it was a part of Madhya Pradesh. The question arises that is it possible to compare growth rates of Chhattisgarh region with that of Chhattisgarh state? So to answer the question it is necessary to mention here the fact that Chhattisgarh has been carved out from Madhya Pradesh with 16 districts forming the state.

The new National Democratic Alliance (NDA) government sent the redrafted Separate Chhattisgarh Bill for the approval of the Madhya Pradesh Assembly, where it was once again unanimously approved and then it was tabled in the Lok Sabha. This bill for a separate Chhattisgarh was passed in the Lok Sabha and the Rajya Sabha, paving the way for the creation of a separate state of Chhattisgarh. The President of India gave his consent to the Madhya Pradesh Reorganization Act 2000 on August 25, 2000. The Government of India subsequently set November 1, 2000, as the day the state of Madhya Pradesh would be divided into Chhattisgarh and Madhya Pradesh.
These 16 districts together formed the Chhattisgarh region of the Madhya Pradesh before the emergence of Chhattisgarh State. The government of Madhya Pradesh collected the domestic product district wise and so the data of GSDP (for the period 1993-94 to 2000-01) of Chhattisgarh region is available with the government of Chhattisgarh. The data for GSDP of Chhattisgarh Region for period 1993-94 to 2000-01 is available at 1993-94 prices has been published by the Chhattisgarh government. The data of newly formed Chhattisgarh for the period 2001-02 to 2009-10 is available in 1999-00 prices. For the compilation of a linked series the available two standards concepts are:-The Splicing method and Reworking the estimates as per the current series methodology. The whole series of 1993-94 to 1999-00 has been converted to a new series at 1999-00 prices using the splicing method.

The data related to Chhattisgarh is published by Directorate of Economics and Statistics, Government of Chhattisgarh since 1993-94 till date. The State Domestic Product of other neighboring states are published in Currency and Finance Reports of Reserve Bank of India and Hand book of Statistics of Indian economy is used to get data of GDP of India.

The growth behavior of the State Domestic Product is the single most important indicator available for measuring overall performance of the state economy both for the short and long time periods. Different methods have been used by various
scholars for calculating the growth of the economy ranging from average of annual percentage change to exponential fits. Some researchers distinguish between growth rates to be used for short period and long periods, and for states and the nation as a whole. A review of all these methods suggests that a simple growth rate, namely the average of annual percentage change would be ideal for this study. Now latest proceed to the analysis of the long term trends in the structure and composition of the Gross State Domestic Product in Chhattisgarh for the period 1993 to 2009-10 with 1999-2000 as the base year for the data. The whole study has been divided into two periods, 1993-94 to 2000-01 i.e. the period before the emergence of Chhattisgarh state and 2001-02 i.e. the period after the emergence of Chhattisgarh state. The base year is now changed to 2004-05, so the comparision of growth rates of neighbouring states and some major states has been done taking 2004-05 as the base year.

For analyzing the data the arithmetic means, standard deviation, coefficient of variation are used. Trend has been analyzed using the linear trend method. To find out the impact of various components on growth of GSDP, A straight line represents a constant rate of growth. To analyze the significance of growth of gross state domestic product, null hypothesis was formed. To test the significance of growth of gross state domestic product, student’s ‘t’ test is used.
\[ tc = \frac{b}{SE} \]

Where, \( tc \) is the calculated value of ‘t’

\( b \) is the coefficient

\( SE \) is the standard error of ‘b’ coefficient.

Bar graphs, column graphs, line graphs, pie chart have been used to present the data. Magnitude of variability in GSDP and its different heads has been measured with the help of coefficient of variation. The growth rate of GSDP, Per Capita Income and Growth rate of the major sectors of the GSDP has been calculated using the following formula:-

Annual Growth-rate is

\[ g = \frac{y_\text{t} - y_{\text{t}-1}}{y_{\text{t}-1}}, \]

Where \( y_\text{t} \) is the relevant variable for the year \( \text{t} \) and the data are for \( \text{t} = 0, 1, \text{t} \) years.

The average Annual Growth-rate is

\[ G_1 = \frac{\sum (y_\text{t} - y_{\text{t}-1})/y_{\text{t}-1}}{T} \]
Outcome of the work - The study has calculated the growth rate of Gross state domestic product of Chhattisgarh for the period 1993-94 to 2001-02 i.e. the pre-period and for the period 2001-02 to 2009-10 i.e. the post period and have compared it and seen what are the changes in the growth and structure of GSDP of Chhattisgarh after forming a new state and also compared it with GDP of India and seen whether this growth rate is at par with the national growth rate or not.