CHAPTER TWO

RELEVANCE OF STATISTICS TO SOCIO-ECONOMIC AREAS

2.1 Introduction

2.2 Applied Statistics

2.3 Objects of Statistics

2.4 Relevance of Statistics to Socio-Economic Areas.

2.5 Limitations of Statistics

CHAPTER -TWO-

RELEVANCE OF STATISTICS TO SOCIO-ECONOMIC AREAS :

2.1 INTRODUCTION :

The origin of the science statistics is tressable to the days of Yore when the ruling chiefs felt the need of quantitative information about their man power and material strength with the view of framing their military and fiscal policies. Hence, they ordered to collect numerical information of the population and the property within their states. Statistics, in this way, was born as the science of the kings or as the science of State craft. Statistics is as old as human languages. When a school boy says that he got 63% marks, or a doctor examines few drops of blood to determine the sugar percentage of the blood of a man, or a farmer examines handful of grains to decide the grade of the whole lot of grains, he is using statistical methods. In this way we find that statistics is embrassing almost all the areas of socio-economic affairs. The meaning of statistics has been interpreted by the different persons in the different senses. Some people take it in the sense of numbers, some others think it to be the arrang--ement of figures and tables giving information about births, deaths, incomes, profits and sales etc. in fact, the word 'Statistics' was first used in this sense only.

In the modern times too, it is being used largely in this sense, when information about any phenomenon is given in numbers. While listening to a radio commentry on cricket, statistical information about the batsman with reference to his previous record is broadcasted. In the same way newspaper publish the statistics about the beauty conte--stants.

In the most modern sense "Statistics is a body of methods for making wise decisions in the face of uncert--ainty." (Wallis and Roberts.) It is used for the coll--ection, analysis and interpretation of data in order to provide a basis for making correct decisions. This con--cept of statistics is very different from the sense it originally used to denote. As its name implied, the word statistics was originally applied only to the facts and figures as the state required for its official purposes. In modren times, the word statistics has acquired far wider meaning and embrasses any set of quantitative data relating to a particular phenomenon whether the particular data are of the state interest or otherwise. The word statistics is used, not only for the material which is analysed but also for the methods applied in its analysis. Thus, in recent times statistics is being used in two senses : as numerical data and as statistical methods.

In common parlance, the word statistics denotes some "Numerical Data". If, for e.g. somebody says that he has studied the statistics of man-hours lost by the Indian Cotton Mills due to the strikes in the year 1970, or he has seen the statistics of automobile accidents in Bombay, he simply refers to the numerical figures or data relating to these phenomena. In this sense statistics are numerical descriptions of the quantitative aspects of things. They take the forms of counts or measurements.

In the second sense, the word statistics is used to refer to the statistical principles and methods, colle--ctively used in the analysis and interpretation of data. In this sense the word is used in singular. Statistical methods (or Statistics) have a very wide range. They include not only simple and commonly known devices of comparision and analysis, but also highly technical and mathematical formulae which are capable of being under--stood only by experts trained in this subject. Statistical methods include all those devices which are used in colle--ction and simplifica-tion of numerical data so as to render them capable of being analysed, and commonly under--stood without much difficulty. Statistical methods are different from experimental methods, in as much as the latter are more accurate and precise than the former. In experimental methods, it is possible for us to study the

effects of any one of the many factors affecting a phen-
-omenon individually by making the other factors inopera-
-tive for the time being. Thus, in Physics, it is not difficult to study the effects of only heat on the den-
-sity of air by making other factors inoperative for the duration of study. But the same thing is not possible in statistical methods. It is not possible to study the effects of only inflation of prices. The effects of infl-
-ation can not be separately studied from the effects of many other factors like demand, supply, exports and imports etc. even then by the use of statistical methods it is possible to have a rough idea of the effects of inflation upon prices. Statistical study can not be as accurate as the study done by experimental methods.

2.2 APPLIED STATISTICS :

Applied Statistics deal with the application of the statistical methods to specific problems or concrete forms. If we have to estimate the national income of a country or its industrial or agricultural production, then the special techniques are followed to achieve these ends and the results thus obtained would form part of Applied Statistics. It is clear from above explaination that Applied Statistics can be further divided into two main groups :

(1) Descriptive Applied Statistics

(2) Science Applied Statistics.

(1) DESCRIPTIVE APPLIED STATISTICS : Descriptive Applied Statistics deal with data which are known and which naturally relate either to the present or to the past. For e.g., business statistics are descriptive applied statistics as they deal with the analysis, measurement and presentation of business facts relating to past or present. On the basis of these facts deci--sions about various business problems are usually taken.

(2) SCIENCE APPLIED STATISCS : Science Applied Statistics deal with the formulation of physical and psychological laws on the basis of quantitative data collected for descriptive purposes by the use of appro--priate statistical methods. If, for e.g. by the use of some business statistics we shall be in a position to derive certain conclusions, which we may use for fore--casting the future trend of that particular phenomenon, we are making use of scientific applied statistics. For the purpose of business forecasting we have to make use of Science Applied Statistics.

2.3 OBJECTS OF STATISTICS :

" The ultimate end of statistical research is to enable comparision to be made between past and present

results with a view to ascertaining the reasons for changes in the future." (A.L. Boddington)

To achieve the above mentioned data relating to past and present are collected and presented in the shape of Time-Series from which valuable conclusions are drawn and these conclusions are used for the purpose of fore--casting the future trend of different problems. Colle--ction, presentation, analysis and interpretation of statistical data are no easy task. Latest statistical methods are to be applied for arriving at correct and dependable conclusions. Researches have been going on for improving statistical methods with a view to make them more accurate and precise so that the laws based on the analysis of the descriptive applied statistics may become comparatively more stable and dependable. Thus, it is very obvious that the science of statistics is very closely associated with the progress of human civilisation.

2.4 RELEVANCE OF STATISTICS TO DIFFERENT SOCIO-ECONOMIC AREAS :

The application of statistical techniques is wide spread in the different areas of human life. From common man in his every day life to an expert in his specialisation field, everybody is highly influenced by the statistics and is using knowingly or unknowingly statistical methods in one or other form.

(1) USE IN AGRICULTURE : The success of our "Green Revolution" can be attributed significantly to the use of statistical techniques in design and analysis of agricultural experiments. Which type of sugarcane yields maximum amount of sugar? which fertilizer is better suited for a particular crop? And such similar problems are answered only with the help of statistical techniques.

(2) USE IN ECONOMICS : Statistical data are exte--nsively used to find the answers to the complicated problems in the field of economics. Important phenomena in all branches of economics can be described, compared and correlated with the help of statistics only. Stati--stics of consumption tells us of the relative strength of the desire of a certain group of community and its variations from time to time. By statistical analysis we can study the manner in which people spend their income on various items of family expenditure, like food, clothing, house rent, education and health etc. In the same way statistics helps to understand the prod--uction capacity to a nation and describe the wealth of nation. It helps us to make comparision of national income year after year showing thereby the effect of changing policies and other factors of production. We

thus find that in all types of economic problems, statis--tical approach is most indespensible and statistical analysis is useful.

(3) USE OF PLANNING : Ours is an age of planning. In almost all the countries today, economic planning has been adopted in one or other form. Today economic acti--vities are being directed more closely to the production of such goods and services as the government decides to be most urgently required. Our future is very largely being planned on the basis of national environments and social needs. Hence, such planning, to make utmost successful must be soundly based on the correct analysis of complex statistical data. Whenever we think of a plan, we have to bank upon statistics. Planning can not be accurate and successful without application of statistics scientifi--cally.

(4) USE IN BUSINESS AND COMMERCE :

The success in Business and Commerce greatly depends upon the ability to forecast, future market trends. Statistics provides different tools and methods of fore--casting demand, supply and production with reliable accu--racy. An industrialist has to take into account the pro--bable demand for his commodity alongwith the competing firm in his business for his commodity. And on the basis

of this information he has to decide his target of the production. The success or failure of a business man is largely depending upon his forecasts of market trends. When a man enters business, in a sense he enters the profession of forecasting. Without having correct knowledge of forecasting, businessman can not attain the expected success. Modern statistical devices have made business forecasting more definite, precise and accurate. Economic barometers are the gifts of statis--tical methods and businessmen all over the world make extensive use of them. A businessman can assess the effects of booms and depressions by statistical calcula--tions only. A study of all trends in the market is a study of statistics and commercial people are bound to make use of statistical techniques in one or other form, if they want to succeed in their profession. Statistics is also useful to brokers, bankers, insurance companies and investors etc. to know precisely the existing trend of market and business activities and to predict the changes in future. A banker has to make a statistical study of business cycles to forecast a probable boom or a depression and has to study in detail the seasonal variations, the demand for money from its clients. On the basis of such statistical study, banker decides his investment policy and the reserves to be kept. Unless

his calculations are correct he is likely to go danger of making a mistake and loosing public confidence. Stat--istical data are most reliable tools of a banker for correct forecasting of future market situations. In the same manner insurance companies, Stock exchange brckers, speculators and investors too greatly depend upcn the statistical data available in their areas to make their business success.

(5) USE IN BUSINESS MANAGEMENT : Every business manager has to make decisions in the face of uncertainty. The essence of modern statistics lies in the development of general principles for dealing wisely with uncerta--inty. Modern statistical tools of collection, classi--fication, tabulation and analysis and interpretation of data have been found to be an important aid in making wise and accurate decisions at various levels of manag--erial functions. The use to which statistical methods are put in this area are many and varied. The business manager relies upon the statistical tools heavily in arriving at correct decisions.

(6) USE IN SOCIAL SCIENCES, WAR, STATE AFFAIRS AND IN RESEARCH : Statistics is widely used in the scholastic studies and extra curricular activities. The findings of these studies are greatly used in the

educational institutions for encouraging students to part--cipate in national activities. To form public opinion correctly, carefully designed statistical analysis has been proved to be very helpful. Statistics are of great importance to the state as they serve greatly in the administration. Modern state makes extensive use of statistical data to find solution on various problems.

Statistical methods and statistical data are increasingly used in the research work in different fields.

In the same way statistics have been used as tool in war strategy too.

By the above observation the relevance of stati--stics to the different areas in human life seems to be of great significance and importance.

2.5 LIMITATIONS OF STATISTICS :

a) Statistics are not useful for individual cases :

The greatest drawback of statistics is that it can not be used in individual cases. Results of Stati--stics are drawn from a large data and they stand true for large groups only. We can forecast the production of rice in India as a whole, but can not accurately predict the production of rice in a particular field of a farmer.

b) Statistics does not study qualitative phenomena.

Though statistics are universely applicable the most important limitation of this science is that it can not be applied to the problems of qualitative study of phenomena. It can not be only applied to those prob--lems which are capable of quantitative expressions. Such phenomena which can not expressed in figures have no use of statistical methods. For e.g. honesty of a man can not be measured by numerical figures and hence in a study of honesty of a man statistical methods are of no use.

c) Statistical Laws are true only on an average.

The results obtained through statistics are not applicable to every individual case. They are true in an average. Statistics deals with such phenomena which are affected by a multiplicity of causes and it is not possible to study the effect of each of these factors separately as it is done under experimental methods. Due to this limitation the conclusions arrived at can not be perfectly accurate.

d) Statistics Does Not Reveal The Entire Story.

Statistics is not capable revealing the entire picture of a problem. Since many problems are affected

by such factors which are not capable of statistical analysis. It is not always possible to examine a problem in all its manifestations only by a statistical approach. But we have to examine the problem taking into account the background of a country's culture, philosophy or religion.

e) Statistical Results Are Subject to Bias :

Although an experienced statistician tries his level best to be objective and objective methods are devised, the results can not be completely free from personal bias. There are many places in the collection of data and interpretation etc. where personal bias does enter.

f) Statistics Can Be Misused:

Statistics are liable to be misused easily. Being a tool any science can be used or misused. It depends upon the values of the user. A person may misuse statistics and draw any type of faulty conclu--sions he likes. In reality statistical methods can be properly used by only trained people. But their use of laymans is likely to lead to give wrong results. It is a delicate science and must be used with caution.

Thus it is clear that statistics is a powerful tool to solve a problem when other methods failed; but it should be used by an expert, trained and unbiased Statistician.

R E F E R E N C E S

1. M.K. Ghosh And S.C. Chaudhari,
" Statistics : Theory And Practice";
The Indian Press (Publications)
Ltd:; 1955.

2. D.N. Elhance, " Fundamentals of Statistics";
Kitab Mahal, Allahabad, 1973.