Unit 1 ,LECTURE 4

IMPORTANCE & LIMITATIONS OF STATISTICS

TABLE OF CONTENTS:

IMPORTANCE & LIMITATIONS OF STATISTICS

1.0 Objectives

By the end of this lesson, you will be able to understand and learn about:

- Importance of Statistics
- Limitations of Statistics

1.1 Importance of Statistics

Statistics is both art and science. It is such an important scientific method that is used in all social and natural sciences. Along with science, it is also an art, so statistical methods are also used to obtain practical conclusions. Anatole France once said about the citizens of China that 'if they don't count, they won't count', meaning their importance will decrease. The use and importance of statistics in various fields and works can be clarified in the following way-

1) **Importance in economic planning-** "Planning is a systematic process nowadays and can be done without data." At present, most of the countries of the world are adopting the process of development without even thinking of planned planning. Planning, whether short term or long term, is adopted for a specific purpose. Determination of these objectives and study of progress is possible only through statistics. The Indian Planning Commission has accepted the importance of statistics in planning in the draft of the fifth five-year plan and has written that "timely availability of reliable, adequate and updated statistical data is the main factor in development."

It is very important for planning." The importance of statistics in planning can be explained in the following way-

(i) For planning, first data related to the country's needs and available resources are collected.

(ii) Short-term and long-term goals as per the needs of the country are determined with the help of data only.

(iii) Data helps in the study of financial resources and correct estimation is made of important things like how much internal and external resources will be available and to what extent deficit economy will be resorted to.

(iv) It helps in distributing expenditure on various items according to the objectives.

(v) Analysis of the achievements of the plan is possible only through statistical methods.

Thus, in the field of planning, statistics and statistical methods are used at every step. Planning without data would be like a ship without a rudder and a compass. Imagining planning without data is like taking a leap in the dark. According to the Indian Planning Commission, "The experience gained from the implementation of plans shows that the importance of relatively more accurate, uninterrupted, immediate and more objective statistics is very high. Apart from this, in view of the increasing complexity of the economy and the improvement in the processes of management and planning, there is a need to compile new statistical data of various types."

2) **Importance in governance-** The word Statistics has evolved from 'State' and since ancient times, statistics has been used to run the administration smoothly. Modern states are welfare states; hence their functions have increased a lot. The work of states or administration is not limited to security and administration only, hence the importance of data in administration has increased even more. Statistics is used in administration in the following manner-

(i) Data such as population, production, national income etc. are essential for studying the rate and status of development and for formulating appropriate policies.

(ii) Keeping in mind the needs of the public, the expenditure to be made on various items like security, health, education etc. is determined.

(iii) In governance management, the budget is prepared every year by the finance minister with the help of data only.

(iv) Guidance is obtained only through data in the formulation of tax policy and other economic policies.

(v) There is a statistical basis behind the various reports and statements published by the government.

(vi) By performing welfare activities, crime related, and some other data get automatically collected.

(vii) The requirements of arms and ammunition are estimated through data only.

In this way, statistics is used a lot in governance and its importance is constantly increasing. At present, separate statistics departments are working at the centre, state and district levels to collect data related to various problems. Due to the great importance of statistics in governance, they are also called the eyes of governance.

3) **Importance in Business-** Statistical methods are used in business for planning activities, determining standards and controlling them. Explaining the importance of statistics in business, Blair has said that if the value-data obtained from newspapers, magazines, radio and telegraph wires are removed for a day, the business world will become powerless. If some of the available data of today is removed from the world for a year, the result will be natural system and expansion. In the words of Ya-Lun-Chau, "It will not be an exaggeration to say that nowadays almost every decision in business is taken with the help of statistics and statistical methods." The importance of statistics in business can be explained as follows:

(i) A businessman gets complete information about the purchase and sale of goods through data. How much demand there will be for the goods, how much quantity of the goods should be purchased, etc. are important decisions for a businessman. While estimating the demand, the consumer's interest, fashion, habits etc. have to be kept in mind. The purchase quantity is determined on the basis of the estimate of demand. The more accurate the data related to the estimate of demand and determination of purchase quantity, the more successful the businessman will be. Bodington has also said that "A successful businessman is the one whose estimates are very close to reality."

(ii) An industrialist determines the quantity of production by estimating the raw material and demand with the help of data. Policies related to exchange and distribution are also determined with the help of data.

(iii) Banking authorities determine the policy of money creation and cash keeping on the basis of data related to demand for money, policy of central bank and condition of money market etc.

(iv) Statistics is the basis of insurance companies. Insurance companies do business on the basis of statistics such as population, birth and death statistics, life expectancy etc.

(v) On the basis of trend in prices in stock exchange markets

Speculators and brokers decide to buy the shares.

(vi) In the Produce Exchange market also, traders and speculators take decisions regarding purchase and sale of commodities on the basis of various estimates of production, demand etc.

(vii) The Railways and Transport Departments determine the fare rates and the number of trains only based on data.

(viii) The basis of cost accounting and financial accounting is data. The cost per acre is determined with the help of data.

The use of data in business organizations is constantly increasing. Most of the business and technological units have separate statistical departments which give suggestions for policy making by collecting and analysing data.

4) **Importance in economics-** There is a close relationship between economics and statistics. The use of statistical methods becomes necessary for the study of all problems related to theoretical and practical economics. According to Ya-Jun-Chau, "Economists depend on statistics for measuring economic groups such as Gross National Product (GNP), consumption, savings and investment expenditures and changes in the value of money. They also use statistical methods to test the truth of economic theories and ideas." Prof. Marshall has also said that "Statistics are the straw from which I have to make bricks like other economists." Statistical methods are used in all branches of economics like consumption, production, exchange, distribution and revenue etc. -

(i) The standard of living of people, elasticity of demand etc. are studied through consumption data.

(ii) National production and the changes in it are studied through production data.

(iii) Pricing policy through data in the field of exchange, volume of imports and exports Jhadi is studied.

(iv) In the field of distribution, the distribution of national income, wages, profits, rent etc. is studied through data.

(v) Under revenue, determination of tax, expenditure and loan policies and monetary policy is possible only with the help of data.

Thus, data is very important in the field of consumption, production, exchange, distribution and revenue. Data is the basis of practical economics.

In the modern era, the importance of statistics is continuously increasing. Some scholars even accept this as the era of statistics. Verbal methods are used in every branch of human knowledge. Tippett has rightly said that "Statistics affects every person and touches life at many points." According to Dr. Bowley, "Knowledge of statistics is like knowledge of a foreign language or algebra. It can prove useful at any time, in any situation." In short, we can say that "the use of statistics has become so widespread that it affects almost every aspect of human activities. Governments use statistics as a basis for formulating their policies and in support of their decisions. Both managers and workers quote statistics in collective bargaining. Competing divisions present statistics to prove the excellence of their respective types of products. We are constantly bombarded with statistics in daily newspapers, radio and TV.

1.2 Limitations of Statistics

While using statistics, it should be kept in mind that this science also has some limitations. Prof. News Home has also written that "Statistics should be considered a very valuable tool of research, but it has some serious limitations which cannot be removed, so we should consider them carefully." The main limitations of statistics are as follows-

1. **Statistics studies only numerical facts, not qualitative facts-** Numerical facts refer to those facts which can be expressed in the form of numbers such as weight,

height, marks obtained, age, wages etc. Qualitative facts cannot be expressed in the form of numbers such as intelligence, honesty, character etc. These facts can be experienced; they can be described but their measurement is not possible. The scope of statistics is limited to numerical facts only; hence it is a limitation of it that the study of qualitative facts is not possible through it.

2. **Statistics studies time, not individual units-** Statistics only It studies groups, not individual units because unless the measurements of individual units are expressed in aggregate form, conclusions cannot be drawn from them. For example, the average expenditure of 100 students in a hostel is Rs. 200 per month. This aggregate expenditure represents the expenditure of all students in the hostel. It does not give information about the expenditure of any student. The expenditure of some students may be more than Rs. 200 and that of some may be less. Similarly, the average per capita income of Indians obtained through statistical methods is Rs. 600 per annum. But the income of most of the 55-crore people is less than Rs. 600. We do not get any information about them from per capita data. Thus, the conclusions of statistics apply only to the aggregate.
3. **The conclusions of statistics are true only in the long run-** The conclusions of statistics The conclusions of sciences like physics and chemistry are not correct in all circumstances, they are correct only in the long run, because it is not possible to achieve complete accuracy in statistics, so a reasonable level of accuracy is considered sufficient. Data is affected by many reasons whose effects cannot be separated. The law of gravity of physics is true at all times and in all circumstances that if any object is dropped, it is strongly attracted towards the earth. Similarly, the laws of all the sciences are correct at all times, but this is not the case with statistics, like the main law of statistics 'Probability Theory' states that if one card is drawn from fifty-two cards of diamonds, then the probability of getting a diamond card is 25%, but it is possible that if four cards are drawn, two diamond cards may come instead of one. But as more cards are drawn, the conclusions will come closer to the probability theory. That is why it is said that the conclusions of statistics are certainly true only in the long run.
4. **Statistical method of study is not the only method.** According to Dr. Bowley, "it (Statistical measurement) is as necessary for solving a problem as accurate measurement is for building construction." The use of statistical method is necessary for studying a problem. But before using its conclusions, they should be

tested by other methods, because statistical method is not the only method of study. According to Croxton and Cowden "It should not be assumed that the statistical method is the only method to be used in archery; nor should this method be considered the best solution to every type of problem."

5. **Uniformity and homogeneity in data is necessary.** Statistical methods can be used only when there is uniformity in the data. For comparison, it is necessary for the data to be homogeneous. By comparing the data with a right angle, the data will be misused, and misleading conclusions will be obtained.
6. **Statistical conclusions can be misleading if they are analysed without context -** If the data is analysed without context, then the conclusions obtained will be misleading. For studying the progress of two students, the percentage of their exam results of the last three years was found out. The percentage of both was the same. On the basis of equal percentage, it will be concluded that the progress of both is the same. But this conclusion is misleading because their analysis has been done without context. One of the students is progressing every year while the other is declining. Hence, the analysis should have been done keeping in mind the exam results of every year. That is, statistical analysis should not be done without context.
7. **Statistical methods can be used only by experts-** In the words of Yun and Kendall, "Statistical methods are dangerous tools in the hands of an incompetent person." Similarly, Dr. Bowley has also written that "Statistics are only an essential but useful tool which is dangerous in the hands of those who are not familiar with their method of use and shortcomings. It is clear from this those statistical methods-collection, presentation, analysis and interpretation should be used only by those people who have basic knowledge of them, otherwise the wrong use of these methods will lead to misuse of data and misleading conclusions will be obtained."

Keeping the above limitations in mind, statistics is a useful science and only those people who know its proper use should do statistical analysis.

1.3 SUMMING UP

In conclusion, statistics play a vital role in analysing data, guiding decision-making, and supporting research across various fields such as economics, medicine, and social sciences. It helps simplify complex information and reveals trends and

relationships that inform sound conclusions. However, statistics also have limitations. Misuse, misinterpretation, or biased data can lead to misleading results. Moreover, statistical methods rely on assumptions that may not always hold true. While statistics are powerful tools, they should be applied with caution, critical thinking, and ethical responsibility to ensure accurate and meaningful insights. Proper understanding is key to leveraging its strengths while minimizing its drawbacks.

1.4 REFERENCES AND SUGGESTED FURTHER READING

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