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四庫全書

Statistics key to development

process with the help of systematic methodologies. These methodologies in the field of

indispensable as aids in every field of research—in physical and biological sciences in economics and sociology, in psychology and education, in medicine and agriculture, in Government and industry. Incidentally statistical methods and experimentation have origin in the field of agriculture and have later been widened in the forestry and forest industries sector. Now-a-days, in Bangladesh, it seems to give a good impetus to the use of statistical methods in all the scientific techniques. Though all these methods are not still being utilised properly, even then it is a good trend for the development of a country like Bangladesh.

It was really an interesting thing when man first enumerated his fingers and realised that the aggregate number of his fingers was same as the aggregate of his toes, was in fact, carrying out a statistical enumeration. Once this idea of counting is established, the census—the complete enumeration of a collection of persons or articles—started quickly. It is the counting aggregate which the layman commonly understands the term statistics. And from this concept the definition of statistics comes that the interpretation of any numerical observational result is the statistics. After the Second World War a tremendous impetus was given to the use of statistical methods in all the applications of scientific techniques, and day by day it has been stepped at the present status. This science is now a recognised aid for decision-making in the face of uncertainty.

background in statistical techniques. Some research workers in our country, possibly with the old idea of mind that one can prove anything by statistics carry out their experiments, sampling surveys (or collect data), without really formulating their objectives. Afterwards, they present the statistician with a mass of figures out of which they hope he will extract the truth. But this sort of idea should be given up. The researchers must keep it into mind that a thorough knowledge of a subject, coupled with profound thought on a particular research point, often produces a phenomenon which cannot be replaced. In fact, it is safe to say that no really big advance in any subject would have been done without the knowledge of statistical techniques.

Statistics sometimes, to most of our research workers appears unduly complex. They think that it is a highly mathematical subject and become frightened of it. But in fact, although statistics and its scientific techniques are based on rigorous mathematics, most of its actual applications are little more than simple arithmetics. Any research worker with keen interest can easily learn these

interest can easily learn these techniques either from the statisticians or from the persons have this background or attending any research methodology course offered from a scientific agency.

Some of these researchers have another misconception. They are always afraid of the negative results of any experimental trial and with this fear in mind they do not even go for statistical analysis. But this a wrong idea. Negative or positive, whatsoever the result of an experiment, is mere the outcome (or

It is also true to say that unless the research workers are prepared to understand the application of modern arithmetical techniques, many small advances in knowledge and practical sense will not be made.

It has already been indicated that without any research the agricultural development of a country cannot be expected. It is the research which develops the scientific technologies of cultivation, crop protection, cropping systems, optimum land utilization, economic use of fertilizer and insecticides and then to transfer these technologies at the farmers' level.

Methodologies in the field of biological sciences are based on statistical techniques and procedures known as biometry. Now-a-days, it is an established fact that no research work is possible in the world without using the statistical techniques or this biometry science. The main research organisations which are at present engaged in crop research activities in the country are the BARI, BRRI, MJRI, BSRI and BTRI. It is a matter of regret that still no research co-ordination system is developed among these organisations and as a result, many duplicating works are being done which should be enunciated without any delay.

well as a Sampling Design is to provide maximum information with a minimum level of cost. Only through proper research with profound statistical methods a country can detect and determine the best variety or the combination of varieties, optimum doses of fertilizer and insecticides, optimum dates of planting and harvesting, agronomical techniques and other cropping systems related to a particular crop.

the experiment may be allowed for in the subsequent analysis. This can only be possible by planned experiments designed and analysed by competent statisticians in collaboration with the scientists in discipline. If any researcher wants to make an efficient design of experiment he has to be careful on some of the basic principles: (a) stating the objectives of the experiment, (b) defining the population about which inferences are to be made, (c) selection of treatments (d) plot shape and size (e) number of replications, (f) randomization, (g) recording of results and finally, (h) layout of the experiment. This is more or less the scope of statistical methods in the field of crop research.

per planning and programming in forest management and forest industries sector is done with profound statistical techniques and procedures. With this view to accomplish them is a Forest Research Institute established in Chittagong in the year 1954.

in the case of crop research which is also more or less same in forestry and forest industries research. The sampling design covers all the areas for survey purposes in the fields of forest inventory and remeasurement works, minor forest product surveys, wild life inventories, silviculture and mangrove silviculture surveys etc.

into the research programme. In our laboratory investigations, the Assigned Causes of Variations are usually eliminated by suitable experimental techniques and the variations in the result being unassignable are due to chance causes. If our experimental techniques are improved we shall be able to assign more causes of variations and thus reduce the variation due to chance. Since one living thing is never exactly like another living thing so in biology or medicine or human genetics, when we have to deal with the experimental determinations, this Chance Variations will always be present. This is why the selection of materials with the experiment itself should be carefully controlled.

Except a few, most of the research programmes are being conducted without any statistical basis of methodologies. For example, if a research worker wants to conduct an experiment on certain objectives, he selects a design himself (whether it is a CRBD, RCB, Lattice, Latin Square or factorial or any other design) and accordingly does the layout also. But if he is not well acquainted with basic principles of an efficient design, discussed earlier, will definitely fail to minimize the experimental errors. He does not consider even some of the influencing factors which are responsible for increasing the experimental errors. And when the project activities are over the research worker come to the statistician for compilation and interpretation of data (collected unscientifically) which creates a very complex and delicate situation to give any indication for decision-making to the objective of the programme. Even sometimes, they compile the data themselves without statistical interpretation which is meaningless to a researcher.

was not also given in this respect. The preference of Personnel Career Development Programme in the discipline should also get the equal priority as it happens in other disciplines.

If this is the pictorial trend of the overall research activity in the country, the future of research is simply hopeless and mere misuse of resources of the hungry millions.

One of the most effective and back-gearing constraints working in major research organisations of the country, is the lack of team-spirit of the research workers irrespective of professional position and status. Every research worker, specially the team leader of a research

gramme should always be co-operative, open and readily available to other members of the team. Even it should be useful to a junior researcher of another discipline who is as useful to this programme. But unfortunately, this type of non-cooperative attitude is still lying with some of senior scientists in different research organisations of the country. It is also applicable in seeking statistical services which is not desirable. I think though late, it is the time for the removal of such attitudes which will lead to a better contribution for improving our research precision and



Bangladesh Agricultural University, Mymensingh, receiving an 'Atomic Absorption Spectrophotometer' Machine as gift from Mr. Reinhard Selberg of Federal Republic of Germany during his recent visit at the Bangladesh Agricultural University Campus, Mymensingh. —OBSERVER.