42260

UNITED NATIONS
ECONOMIC AND SOCIAL COUNCIL

Distr.
LIMITED
E/CN.14/STPA/4
8 August 1979
Original: ENGLISH

ECONOMIC COMMISSION FOR AFRICA
Meeting of Directors of the STPA Centres
Addis Ababa, 22-26 October 1979

NEW AREAS OF STATISTICAL DEVELOPMENT

C O N T E N T S

Introduction

1. The teaching of statistics at the middle, intermediate and undergraduate levels in Africa has tended to follow traditional syllabuses. Thus, statistical theory and methods, sampling techniques, design of experiments, statistical inference, economic statistics, demographic statistics, data processing etc. have featured prominently in the content of training at the various training centres. In both the theory and applied fields, there has been very little attempt to adapt the course content to the changing needs and priorities of the region. There has also been very little attempt to be innovative in the choice of subject to be covered. In the context of STPA, where some emphasis is to be put on the practical-orientation of training, it is worth taking a look at the possible options available to the statistical training centres in Africa.

2. In the field of theory, there is the need for periodic updating of syllabuses by consulting relevant articles in such scientific journals as the Journal of the American Statistical Association, Annals of Mathematical Statistics, Biometrika and Technometrics. Such journals usually contain new ideas which can be incorporated at appropriate levels of training without unduly overloading the syllabus or overtaxing the mental capacity of the students. By not updating syllabuses in this way or always waiting for new editions of text books to be issued which incorporate the new material, the tutors place the tutored at a disadvantage.

3. However, it is in the field of applied statistics that innovation and keeping up-to-date with contemporary developments is likely to yield great dividends. In this paper, therefore, four examples of new areas of priority in the field of applied statistics will be considered together with the general courses and the possible options in teaching the courses. The four areas to be considered in order of priority in relation to the level of African statistical development are as follows: household surveys, social statistics, energy statistics and environmental statistics.

Household Surveys

4. It may be recalled that in 1973 as a sequel to the African Census Programme the eigth session of the Conference of African Statisticians recommended the establishment of the African Household Survey Capability Programme (AHSCP). The primary objective of the AHSCP was to enable African countries which have not established field organizations to do so and to assist those with field organizations to stengthen them. The statistical infrastructures so established were to be utilised in the collection of integrated demographic, social and economic data on households and household members. The AHSCP has been recognized by the ECA Conference of Ministers as well as by the UN Statistical Commission as an important mechanism for the collection of much needed data for planning for socio-economic development. It is important therefore that the statistical training centres in the region should take cognizance of the programme and reflect it in the content of their training.

5. At present, only the subject, sampling techniques or sampling theory and practice, appears to be taught, and this usually from a theoretical viewpoint, in spite of the many "practical" examples which are usually given. However, sampling forms only a small part of the technical knowledge required to organize household surveys and process and analyse the reuslts. Other skills required relate to survey organization, interviewing techniques, data requirements with their corresponding concepts, definitions and classifications, quality control, data processing, data evaluation and analysis and report preparation, publication and dissemination. These are all essential elements which must be presented to the student in a coherent and unified course. Of course, the student is not required to specialize in all these aspects of survey work but he should have a working knowledge of most of them.

6. It may be mentioned that in the past centres like the Munich Centre for Advanced Training in Statistics and the Institute of Development Studies have run courses for the practising statisticians, but there is the need for similar courses with varying degrees of sophistication for the middle, intermediate and undergraduate statistics courses. There will be a reversion to this point later when consideration is given to the mode of incorporation of the new areas of statistical development into the standard curriculum for the training centres.

Social Statistics

7. There was a time when economic statistics was given pride of place in the curriculum of statistical training centres all over the world to the utter disregard of social statistics. But it has now become increasingly recognised that the social problems of society must be studied and measured. Thus social indicators as both indicies of social development and social concern have been proposed. Also the importance of the basic needs of communities and individuals implicit in the concept of "basic needs" proposed by the I.L.O. and other international agencies has brought social statistics into prominence. In this connexion, it should be noted that the majority of social scientists are now considering social statistics within the context of social and demographic statistics, since the two subject-fields are closely interrelated. In the System of Social and Demographic Statistics 1/ the following fields are identified as relevant subsystems: the size and growth of the world's population, regional population density and urbanization, high-level consumption and its growth, natural resources and the environment, families and households, social class, stratification and mobility, the distribution of income, consumption and wealth, housing conditions and neighbourhoods, time and leisure, social security and welfare services, learning activities, earning activities, health and medical care, and public safety and order. Statistics related to these fields could form the basis of a relevant course in social statistics. The advantage of using a framework similar to this is that the actual content of each field could be varied depending on the contemporary state of the art and the priorities of African governments.

8. An appropriate syllabus can be prepared around these sub-systems with emphasis on data collection mechanisms, appropriate concepts, definitions and classifications and social indicators. With reference to social indicators, the various indicators of relevance to Africa can be considered together with the various methods devised for obtaining a composite index. In particular, the advantages and disadvantages of the concept of taxonomic distance for ranking countries in relation to their social development should be studied.

1/ United Nations. Towards a System of Social and Demographic Statistics United Nations, New York 1975

9. The field of social statistics is always being enlarged by the introduction of new topics and the syllabuses of statistical training centres should be aware of this and amend their syllabuses when necessary. It would be a pity if centres turned out candidates who were not up to date in an area of considerable importance to the practising statistician. In this context, it should be noted that social statistics as a subject is not new but it is the way in which its content can be varied in the light of new theoretical developments and contemporary social ideas that puts the subject in the category of "new areas" of statistical development.

Energy Statistics

10. In 1973 the oil crisis brought to the forefront the importance of energy statistics. Unfortunately, in spite of the energy crisis, most African national statistical offices do not produce relevant energy statistics so vital for planning purposes as well as for decision-making. The situation has not improved with the creation of new ministries of fuel and power in a number of African countries, since these ministries lack adequate data to guide them in their work. Part of the blame for this unsatisfactory state of affairs can be put on the training centres who do not equip their students with the necessary skills to produce the relevant data.

11. It is important therefore that these centres should give priority attention to the teaching of the basic elements of energy statistics. An excuse sometimes used by centres for not tackling these new challenges is that fields such as energy statistics are at best ill-defined and thus there is not a recognised body of knowledge which can be imparted to students. Though some areas of energy statistics may still be fuzzy, the basic elements are clear-cut and present to problems. The focus of such courses should be on energy balances or accounts. This should cover primary energy sources as well as the imports, exports and stock changes of secondary energy and how these are to be measured.

12. It may be recalled that the Expert Group on Classification and Measurement in the field of Energy Statistics (UN Headquarters, New York 6 to 14 March 1978) recommended that "an over-all energy balance should cover all flows of energy, including the so-called 'non-commercial energy sources" and "the framework of the overall energy balance should not be limited by the lack of availability of data". 1/ Thus the teaching programme should cover the general framework as at present presented by the UN Statistical Office. The mere fact that revisions of this framework in the future are possible and in fact inevitable should not inhibit its use, since the present structure is capable of serving the needs of the African region.

Environment Statistics

13. Of the four "new" areas of applied statistics mentioned in paragraph 3, the most controversial is environment statistics. The problem stems from two sources: its actual priority among African countries and the state of

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1/ United Nations Statistical Commission. Progress Report on the Development of International Energy Statistics E/CN.3/504 New York 1978

the art. With respect to the degree of priority accorded to environment and environment statistics by African governments, it is probably true to say that only minimal attention has been paid to these questions by them. However this does not in any way indicate the overall priority which should be attached to this subject. In this context, it is important to stress that the objective of environment statistics is to "monitor, assess and deal with those urgent questions" relating to man's environment "in order to achieve national and international environmental management".

14. With respect to the state of the art, it is fair to say that it is a developing field and not all the areas are clearly delimited. However four areas have been identified by the United Nations Environment Programme and the UN Statistical Office. These are "environmental aspects of human settlements; environmental aspects of the supplies and demands for replaceable and irreplaceable natural resources; environmental aspects of the pollutants and wastes generated by and pressing on industrial and non-industrial, governmental and household activities; and the environmental aspects of the quality of the media (air, water and soils)." 1/ By considering statistics relating to these areas, a suitable framework for a course in environment statistics can be found.

15. It is relevant to note that some of the areas defined in paragraph 14 overlap with some sub-fields of social and energy statistics but such duplications are not uncommon in syllabuses and the teaching programme can usually take care of this.

The Teaching Options

16. In the preceding paragraphs consideration has been given to the justification for the inclusion of courses on household surveys, social statistics, energy statistics and environment statistics in the study programmes of the statistical training centres in Africa at all levels, where these are not currently being offered. The content of the courses have also been briefly outlined. In this section, an examination of the possible arrangements for teaching the courses without undully upsetting existing time-tables will be considered. The first option is to try to distribute the new courses among existing ones. For example, the household survey course will be combined with the sampling course, the social statistics course with the demographic course and the energy statistics course with courses in general economic statistics. The relevant sections of the environment statistics course will as far as possible be distributed among these three groups.

17. The second option is to have a combined course called "new areas of statistical development" and attempt to cover all four subjects. This has to be handled rather carefully, since the subjects do not all fall into a homogeneous category. The third approach is to teach each subject as a separate course. The implication under this last option appears to be that

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1/ UN Statistical Commission, Progress Report on the Co-ordination of Environment Statistics New York E/CN.3/520 March 1978

statistical teaching programmes will have to become more subject-oriented if they are to be effective and practical. The option each centre selects depends on the possibilities in its existing time-table.

Conclusion

18. The four subjects suggested are examples. With the changing needs and priorities in the region, new areas will spring up which require the attention of the training centres. The centres should be flexible enough to adapt themselves to these changing conditions and thus be in a position to ensure that they are producing statisticians with the requisite theoretical knowledge who are also practically-oriented and can carry out useful functions in government as well as in private statistical organizations.