



48714



UNITED NATIONS
ECONOMIC AND SOCIAL COUNCIL

Distr.
LIMITED

ST/ECA/STPA/WG1/5.2
21 October 1981

Original : FRENCH

ECONOMIC COMMISSION FOR AFRICA
Working Group on Statistical Organization
and Manpower
Addis Ababa, 26-30 October 1981

PLACE OF RESEARCH AND ANALYSIS
IN STATISTICAL OFFICES *

C O N T E N T S

	<u>Paragraphs</u>
Introduction	1-4
Definition	5-8
Types of Research and Analysis	9-13
The Role of Research and Analysis	14-23
Conclusion	24-25

*By:

Awa Thiongane
Directrice
Direction de la statistique
Dakar
Sénégal

Introduction

1. Numerical data today occupy a major place in all areas. The demand for statistics continues to grow and becomes increasingly urgent. The development of computer science has provided a near over-abundance of information. Quality control is required and cannot be carried out without research.
2. Users must be provided with not only raw data but also accessible, readable information. The need for analysis is imperative in statistical offices.
3. This document is intended as an initial reflection on the problems that relatively young statistical offices may encounter when faced with the ongoing needs for research and analytical work. It synthesizes the main ideas already presented in other reports dealing with the same topic.
4. Consideration will be given to the problems of defining the area covered by research and analysis and of organizing them within statistical offices, particularly in developing countries.

Definition

5. In the Secretary-General's report on statistical organization (E/CN.3/495) written for the nineteenth session of the Statistical Commission held in November 1976, research is defined as "an activity aiming to bring forward new knowledge usually involving considerable study, testing and experimentation" (paragraph 34). The document continues, "the process of testing, evaluating and generating research findings necessarily involves a degree of analysis, but the word analysis is often applied to the statistical outputs". The author subsequently acknowledges that, "while the distinction between research and analysis is arbitrary, it is convenient to use the word 'research' in relation to the process of developing and producing statistics and 'analysis' in relation to the operations on the resulting data".
6. The author of this paper agrees that the word research is ambiguous and that the distinction between research and analysis is arbitrary.
7. Any research undoubtedly involves a certain amount of analysis of research materials in order to arrive at the "new knowledge" which is the result of research. For example, research on the applicability of an analytical method includes an analysis of the data already produced, which in turn can bring to light any inadequacies in these data.
8. At the same time, there is another type of analysis which is carried out to discover new laws, or at least constants, that link variables, explain developments, etc., and which takes the form of research.

Types of research and analysis

9. The dyad "empiricism/formalism" is generally present in research and analytical work and explains the area that they cover, specifically: theoretical studies, improvement of methodology, questioning of data, in-depth study of facts, etc.

10. The road leading from factual observation to the active production of models, for instance, is studded with research topics. Research as it is understood here is inseparable from the following two types of analysis:

- Analysis which is, "employed to explain changes in movements and relationships of data in the light of associated events, with the intent of interpreting their significance 1/";

- Interpretative analysis that, "is illustrated by monographs or papers on special topics... Involving a synthesis and sifting of large masses of data derive from census, surveys and other sources 1/".

11. In contrast, two other types of analysis are distinguished from research. These are.

- Analysis which is carried out at the various stages of statistical production in the sense of a "systematic probing of the consistency 1/" of a written description of results, etc;

- Analysis undertaken by, "distilling the highlights of the statistical results 1/" so as better, "to convey information to the public 1/".

12. This latter type of analysis has two aspects:

- A technical aspect which should make it possible to arrive at the appropriate method for obtaining the statistical data so that their limits can be set;

- A purely analytical aspect, which brings out the basic elements of conclusions that can be reached following a study of numerical data.

13. "This type of analysis must be non-controversial and yet avoid blandness. This is a difficult objective to achieve 1/". Impartiality and objectivity must be maintained at any cost.

The role of research and analysis

14. While there are many alternatives, they will be considered here in terms of the situation of relatively young statistical offices, where the choice of organizational models depends on limiting factors. The human factor presents a problem here. It is quite difficult to carry out research in a statistical office when the research staff is inadequate or constantly changing. This is the situation that exists in most African statistical offices

15. For analytical work, solutions are less complex. In fact, so-called basic analytic work must be carried out in a decentralized fashion within the very units that are producing data.

16. The second, more complex type of analysis requires somewhat greater centralization, depending on individual cases. Monographs call for specialization; in contrast, synthesis should be carried out in a highly centralized fashion. Other institutions may even be called in to collaborate on the second type of analysis.

17. This work can be included as part of the regular work of the statistical office (economic syntheses, for example), or may be carried out by individual staff members of the statistical office in order to meet specific needs. This may benefit the statistical office in so far as it motivates some staff members who would otherwise feel that they are merely carrying out routine work. In some countries, young recently trained statisticians with a strong theoretical background look down on the routine work of statistical production. If analytical work was to be included in statistical offices, they would be more motivated to make a career of these jobs. This work takes priority over research, which is often presented as a luxury. However, research should be included as a "necessary luxury".

18. In the first place, the term research is often used in a broad sense and includes certain surveys which ought in fact to be carried out by all statistical offices in so far as possible, in order to establish necessary statistical data bases in all countries. However, the sense of the term research employed here excludes these surveys, even if they result in "new knowledge". Research as it is meant here is research which improves the methods used in the routine work of statistical offices, specifically, polling methods and methods for improving systems of processing, storing and managing ever greater quantities of data. In particular, this type of research must be directed towards a more thorough consideration of the theoretical hypotheses of statistical tools, which are all too often overlooked. This would result in a sort of meta-language. In fact, the rigours of mathematical formalism are often a facade making it possible to justify many often incorrect conclusions through generalization. However, "the finalization of a theory should not serve to perfect the theory itself". 2/

19. Nevertheless, a balance must be struck between types of research, since research must above all improve existing and even develop methods more likely to produce statistical data that are more reliable, more quickly available, well presented and more indicative of social and economic phenomena to meet user needs. To achieve this objective, at least some research must be carried out in statistical offices either at the divisional level or in a special research unit. These two options present advantages and disadvantages:

- The staff of any division is generally so involved in routine work that research can be neglected;

2/ Recueil des Journées pédagogiques de la formation statistique
en France organized by CESD, Paris, 7 to 11 July 1981.

- Co-ordination of divisional research may be difficult;
- The research unit may not participate sufficiently in statistical production;
- An unhealthy elitism may take hold within the statistical office, with the research unit claiming to deal with scientific knowledge while the divisions merely perform housekeeping duties.

20. The balance established will depend on the material and, specially, human resources of each statistical office, the level of training of its senior staff and the diversity of its staff as a whole.

21. Possibilities exist for collaboration with training centres in African countries. French-speaking statisticians are normally trained in training centres separate from universities. Advantage should be taken of the availability of instructors and, on occasion, students from these centres to provide supplementary personnel for statistical offices and to carry out the following research:

- Put statistics instructors in constant contact with statistical works so that they can better understand the future working conditions of their students;

- Familiarize students with professional practices from the outset of their studies.

22. In addition, since these centres are generally regional or sub-regional training centres, they become a focal point for intra-African co-operation in statistical development. By having nationals from various countries participate in research at the host country's statistical office, the basis is laid for future regional co-operation.

23. Co-operation should also be sought with other administrative offices (planning and forecasting services, etc.) and universities. A mechanism for this co-operation is thus necessary. In some countries, the Ministry of Scientific Research assumes this role of co-ordinator, but statistical research is not always included in this co-ordination.

Conclusions

24. Research and analytical activities are indispensable to any statistical office. However, for them to be relevant, statisticians must keep in mind:

- That their vocation is to provide business and Government with the data needed for the drawing up of development policies, their follow-up, implementation and evaluation, etc.;

- That they should not lose the foresight which enables them to anticipate future developments in their field.

25. The search for original research should not be carried out to the detriment of the priority needs of a statistical office. What must be done is to strike a difficult but necessary balance in order to meet seemingly contradictory objectives.

EXTRACT OF DOCUMENT E/CN.3/495 PREPARED FOR
NINETEENTH SESSION OF THE STATISTICAL COMMISSION

E. Research and analysis

92. "Research and analysis", if well done, enhances the internal capability of the statistical office and also its prestige and external capability. Moreover, it is conducive to forming closer working relationships with universities and research institutes. However, while very important, these functions are often overlooked in organizing statistical offices, either because of lack of resources or because of insufficient recognition of their role in producing good and timely statistics. They therefore merit special mention here.

93. The question may be asked: what kind of and how much research and analysis is it appropriate for a statistical office to do? The answer to this question may be inferred from what follows, but it must be emphasized that unless it is in the right hands, research can be wasteful and analysis dangerous. A rule that should be insisted on is that the impartiality of the statistical office must be maintained; published commentary must be factually based and objective, with no value judgements in regard to policy.

94. Since the terms "research" and "analysis" are ambiguous, it is necessary to define them. In general, research may be described as an activity aiming to bring forward new knowledge usually involving considerable study, testing and experimentation. The activity is usually undertaken in a statistical office with a view to implementing a change for the better - in the reliability or composition of the statistical output, in the methods or procedures of producing it or in the manner and detail in which it is stored, retrieved or presented. The process of testing, evaluating and generating research findings necessarily involves a degree of analysis, but the word analysis is often applied to the statistical outputs. While the distinction between research and analysis is arbitrary, it is convenient to use the word "research" in relation to the process of developing and producing statistics and "analysis" in relation to the operations on the resulting data.

95. The process of developing and producing reliable and timely statistics involves many intellectually challenging activities which can be appropriately classified as research. Major changes in the statistical process - whether in the form of new statistical series, of significant improvement in existing data or of the efficiency and timeliness of producing them - are not, or should not be, a matter of routine. They are often intricate and time-consuming. They involve, or should involve, much study, testing and experimentation. Thus the notion that a statistical office is nothing more than a "figure factory" is wrong, even though a substantial amount of routine is necessarily involved.

96. Examples of research in a statistical office include work leading to improved design of sample surveys and censuses; research in developing generalized computer processing systems; research into methods for estimating information for small regions; research into methods for constructing or improving the national accounts and balances, including input-output tables; research into seasonal adjustment of time series; demographic research and projections; With the growing attention to planning, there has been a growing demand on many statistical offices to carry out projections of population, labour force and school enrolment. Since projections are basically the arithmetic consequences of the assumptions underlying them, it is essential that the latter should be as realistic as possible. This involves extensive research into the individual components comprising the projections - mortality trends, fertility trends, immigration and emigration, and so on.

97. We turn to the question of where the research should be carried out. Where there are only a few people available to carry out this work, the choice is limited - of necessity the work will be carried out at a central location. Even as the group grows larger, practical considerations may dictate that this activity should continue to stay centralized, at least for a time. The activity requires to grow beyond a certain minimum size to surpass the "critical mass" stage and make its influence felt throughout the organization. There are career considerations as well as those of economy which may render centralization more realistic. A further factor militating against decentralization in the earlier stages is that pressures of day-to-day work in the divisions tend to absorb research people in the purely production activities. Location at the centre provides a degree of protection. It is, however, vitally important that such "protection" should not result in isolation; those engaged in research at the centre must work closely with subject-matter personnel on specific projects. Every attempt must be made to render the research relevant and purposeful.

98. When resources become adequate, a capability for carrying out research within the various divisions should be evolved. As it is true of most other activities, the point of optimum trade-off between concentration of scarce research resources at the centre and in the divisions changes as the organization grows in size and professional resources grow more plentiful. But the necessity for strong integrating and co-ordinating influence increases as the research activities become more pronounced in the divisions. At any rate, the development or adaptation of integrating instruments, such as the national accounts and standard classification systems and across-the-board devices, such as seasonal adjustment, involve centrally located research. Central location is also most practical in the case of research in developing new or more efficient methods for collecting, processing retrieving, or disseminating information.

99. Analysis is involved in preparing reliable statistical data for publication, even when the results of the analysis, as such, are not published. At various stages of the statistical process, judgements must be made on whether the results up to that stage make sense, and this frequently involves systematic probing of the consistency of the data. Such probing becomes particularly critical at the final stages prior to publication. This type of analysis is clearly done more effectively in the various subject-matter divisions.

100. In addition, there is the type of analysis which consists of distilling the highlights of the statistical results and expressing them in written form. The process of producing statistics is often incomplete if it does not include this type of analysis. Numbers, even if reliable and valid, are not enough to convey information to the public. This type of analysis must be non-controversial and yet avoid blandness. This is a difficult objective to achieve. It is carried out most effectively in the subject-matter divisions of the statistical office, as it requires great familiarity with the data.

101. Another type of analysis is employed to explain changes in movements and relationships of data in the light of associated events, with the intent of interpreting their significance. Such analysis requires not only familiarity with the data in a variety of related fields, but a good grasp of relevant theory and the general institutional and other factors at play. It is usually carried out within the context of models, at least by implication. The process of carrying out and writing up such analysis provides a discipline and stimulus for exploring more deeply the validity and significance of the statistical results, and for identifying important gaps and inconsistencies in the data. It is essential that the narrative, especially if it is intended for publication, be prepared by people who have the capacity for detecting and explaining significant trends and inter-relationships in the face of detailed and, at times, conflicting data. This sort of analysis can best be carried out at a central location, in particular in conjunction with national accounting and balance-of-payments work.

102. A similar but more general type of interpretative analysis is illustrated by monographs or papers on special topics, e.g., income, fertility, migration, the labour force, involving a synthesis and sifting of large masses of data derived from censuses, surveys and other sources. This requires thorough familiarity with the characteristics of the data, as well as competence to bring out and describe the underlying features from a massive amount of detail. The work can be carried out either at the centre or in the appropriate subject-matter divisions, depending on the topic and circumstances.

103. Every effort should be made to develop a capability in the statistical office to carry out analytical work competently. Among other benefits, such work has important feedback effects in that it helps to clarify difficult conceptual, methodological, data and presentational issues. Further, it provides practical experience by helping statistical officers to develop the kind of comprehension that evolves from actually working with the data - a comprehension not only of the surface problems but of the more complex and practical ones as well. Such comprehension strengthens the capability of the statistical office to evaluate, with insight and authority, the practicality as well as the importance of user demands and the most effective ways of responding to them, as indicated in chapter V. Unfortunately, few statistical offices in developing countries, and by no means all in the developed ones, are in a position at present to undertake this type of work which, given the resources, can often be carried out more efficiently in the statistical office in view of its ready access to a massive amount of detailed information. The absence of such work is a factor in the reluctance of many university graduates to join statistical offices. They prefer work which involves using, not just producing statistics. It should be stressed, however, that collection and dissemination of data are the primary obligation of a statistical office, and the analytical work it undertakes should in no way cause delays in making the basic statistics available to outside users.

104. It should be noted, finally, that the decisions on priorities made in the statistical office have a considerable and perhaps decisive influence on the type of analysis that users will be able to make in the future. In order to carry out these decisions in a perceptive and responsible way, it is in the interest of the users as well as of the statisticians that the statistical office should be intimately familiar with the prevailing analytical developments. This is best achieved by equipping the statistical office to carry out analysis; but failing this, the statistical office should seek opportunities for being involved in analysis carried out in other government departments so that at least some of the feedback from this work is available to it. To facilitate this, it is necessary for the statistical office to have at least some qualified, centrally placed personnel.