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STATISTICS NECESSARY FOR PROJECTS

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Introduction

There has already been ample discussion on the statistical series necessary for planning, and lists of statistics have been prepared in connexion with the formulation, devising and control of plans. These lists indicate what statistical series are considered essential and the frequency with which it is desired to obtain the information (for example, population censuses and surveys on areas planted every ten years, censuses on industrial establishments every five years, assessment of agricultural yields every year, imports and exports every month, and so on). In the same way, the geographical area for which the information is required has generally been indicated. For plans proper, assessments for the entire country possibly with sub-totals for the major administrative divisions are usually what is needed.

The United Nations has published a document Statistical Series for the Use of Less Developed Countries in Programmes of Economic and Social Development, Series M, No. 31, of the Statistical Papers, New York, 1959. The Third Conference of African Statisticians studied this question and that of special adaptation to African conditions. A Working Group of Statisticians and Planners met at Addis Ababa in July 1965 and took over with some minor amendments the series, periods, coverage and priorities indicated in United Nations document M.31. A document E/CN.14/CAS.3/9 entitled Use of the Revised List of Basic Statistics for Programming Statistical Development indicates the targets that should be aimed at by the African countries. At the same time, a group of experts in planning and statistics working in the French-speaking African countries drafted a list that was virtually the same in the document Les besoins en formation statistique de la planification (Statistical training needs for planning). This group of experts also gave an appreciation of the level of accuracy that can reasonably be asked or expected from each statistical series. In this case also, it was obviously out of the question for statistical information to be obtained at the local level or systematically collected on a permanent basis.

As far as overall planning is concerned, it is therefore certain that the needs of the planners have been stated clearly so that statisticians have been able to direct the working programmes of the national statistical offices to meet these needs.

However, no similar study seems to have been made with regard to projects and it may be feared, as a result, that certain demands expressed by planners cannot be met in the time required. It may also be feared that it will be physically impossible to supply valid and sufficiently accurate information owing to the lack of skilled personnel, the high cost of surveys and the time needed to carry them out.

It is therefore expedient at this juncture to raise some questions about these problems and to attempt to see what can be done.

Are the same statistics needed for projects as for plans?

One first difference immediately becomes apparent. The geographical scope of projects may sometimes be very small and even as low as the local level or a small administrative sub-division, whereas a plan will never be devised for such minute units.

A second difference stems from the specialization of projects. While planning methods, especially if the overall macroeconomic approach is used, have common features in all countries and therefore call for similar information, projects are much more specialized in nature and must therefore be based on information in a wide variety of fields. It is clear that the statistical series called for by the planner in formulating a project and then at the stage of implementation and control will be very different for a hydroelectric barrage, a new railway, the opening up of a mine or the development of varying types of agricultural schemes. In the latter case, it will be necessary to obtain information locally concerning areas planted, yields obtained, the composition of expenditures of households, and the nutritional level, etc.; in the case of a barrage, the information might rather, for example, concern the industrial development of a town at some particular distance from the barrage. The problems raised are specific to each case and it seems difficult, if not impossible, to prepare a single

list that would meet the requirements of all special cases without including useless information and at less expense than special lists.

Can statistical series established for planning be used for formulating projects and controlling their implementation?

When regional, sub-regional, or national projects are formulated, very often most of the data obtained for the formulation of the plans can be used, although this does not mean that they will answer all the questions raised in connexion with the projects. For example, an oil refinery project may necessitate market studies even outside the region, that is to say, apart from those made for the national plans, while the data collected nationally on transport, urbanization, the development of industrial production, the growth in the consumption of households or general government in formulating the plan can be directly used for study of the project.

The data collected for the formulation of plans will therefore generally be a source of valid information for large-scale projects, but unfortunately the same does not apply when the projects are too local in scope. In fact, the methods that statisticians use do not usually make it possible to disaggregate information for very small areas. The two main tools for collecting statistical information are complete enumerations and sample surveys.

Complete enumerations give information to any desired degree of detail. Unfortunately, they are extremely expensive, call for a large staff and are very time-consuming. It is out of the question for complete enumerations to be carried out in all fields in which statistical information would be necessary. At the moment practically only population censuses dealing with relatively simple questions are carried out in Africa, and even then at intervals of the order of ten years. Sample surveys are much less expensive and yield valid information for countries or major regions and on the most specialized subjects, if necessary, with relatively few specialized staff. Unfortunately, owing to the very principle of these surveys, the local information collected at one point cannot be used at that level, and becomes significant only when, combined with local information collected at other points, it describes the whole of the country or its major regions. In other words, although a sample survey with some hundreds of sampling points

distributed throughout the territory gives, for example, the production of rice for the whole country or of a major administrative sub-division with sufficient accuracy, the three or four sampling points in a small zone of the country cannot be used to determine the production of this small zone, or to indicate, for example, the marketing potential of a co-operative project within it. In fact, the unreliability of any assessment that could be made from the three or four sampling points would be such that the averages obtained would have a random margin of error of the order of 200 or 300 per cent, so that they would be quite valueless.

To draw a comparison from another field, it could be said that the statistical data required for planning correspond to geographical maps covering the whole country at the scale of 1:1,000,000 or 1:250,000, whereas the data necessary for the identification of local projects would correspond not to geographical maps but to topographical or cadastral surveys at 1:1,000 or 1:2,000. In the same way, as the water tower for a town cannot be sited by means of a geographical map, the results of sample surveys for a whole country cannot be used for application at the local level.

What solutions can be found for these problems?

It seems that the problems raised in connexion with important projects concerning countries and larger units (sub-regions or the entire region) and in certain cases projects for the major administrative divisions should not be too difficult to solve. On the one hand, the statistical information that should throw light on these projects has often already been gathered for the formulation of plans; on the other hand, these projects are large enough to permit the financing of special statistical surveys if the need for some particular information is felt. The chief problem is local projects for which the cost of valid information very rapidly becomes prohibitive. Therefore we shall concentrate on projects at the local level. Let us assume that sample surveys on the yield of rice in tons/hectare had been made for the entire country and for the major regions during previous planning studies to discover whether it was better to raise production by increasing areas planted, that is to say, mainly by granting funds to rural engineering services, or, on the contrary, by expanding agricultural services, the distribution of fertilizers, the

genetic improvement of seed, popularization of the use of pesticides, and so on. For such sample surveys, it will doubtless have been necessary to select, say, 1,000 randomly distributed sub-samples for every major administrative sub-division to discover the yield correct to  $\pm 3$  per cent with 0.95 probability.

On this assumption it is probable that, if we need to know the rice yield for the establishment of a co-operative or the development of a new agricultural scheme, the cost of the necessary statistical survey will be approximately of the order of magnitude of a national survey and by no means proportional to the areas in question. The cost will doubtless be reduced because there will probably be greater homogeneity in the small zone in question and because of the reduction in travel and thus transport costs, but, if the area of a country was 1,000,000 km<sup>2</sup> and that of the small zone only 100 km<sup>2</sup>, the cost of the survey would, perhaps be one-third or one-quarter but surely not one-thousandth of that for the whole country. The complete enumeration method, which would consist in weighing the entire harvest over the 100 km<sup>2</sup> and weighing the entire harvest of each farmer living in this 100 km<sup>2</sup>, would be prohibitive in cost, and in any case quite impracticable.

This example seems to be a fairly good illustration of the difficulties of making estimations at the local level.

In their attempt to produce estimates for local projects despite such difficulties, statisticians have tried to find out whether local officials and other staff could be asked to provide valid data which they could collect and send to central statistical offices. First of all, a survey was made of what information already existed. There has for a long time been a considerable mass of reports, notes and documents in Africa. The colonial administration generally required the various echelons in its hierarchy to submit reports and figures in all fields and at all levels. Unfortunately, when statisticians studied and checked the validity of the information appearing in these documents, it was seen that the majority was valueless and was based only on rough and subjective estimations made locally by unskilled personnel; totalling them for the major administrative regions or for a whole country would have the effect of concealing

the most blatant errors although the figures obtained would not have the slightest value.

Although this method has proved completely worthless in the past it is periodically suggested that permanent card indexes or registers should be drawn up and filled in by personnel working in the villages, agricultural instructors, primary school teachers, pupils, and so on.

Such a course of action is a mere pipe dream and shows a misunderstanding of modern survey techniques and total ignorance of African realities. Experiments of this type have been tried in most African countries, sometimes several times over, and record books have been set up for villages and registers for districts or hamlets. Each time the experiment was a complete failure. True, information was entered in these registers and was, by the way, often used as such with innocent faith by the promoters of the registers. However, the first mildly serious checks showed that the entries were entirely subjective. The agricultural instructor with his own promotion at heart regularly increased year by year the imaginary yields that he had noted down for the previous year, the village chief wishing to please those he administered systematically decreased the estimates that he had made of the cattle population, if the latter was taxed, and so on.

In a countercheck made in an African country, village record books were set up to demonstrate the ineffectiveness of this method and trap-questions were introduced to verify the information given in the various parts of the questionnaire. For example, the sex-ratio at birth, which is physiologically almost constant at 105 boys to 100 girls, and the proportion of twin births to normal births give some idea of the quality of the registration in vital statistics records. Another example, questions on yields showed that heads of cantons indicated groundnut yields varying from 25 kg to 50,000 tons a hectare !!!

In another country, where the party in power represents a considerable force, a village record book experiment was made under the patronage of the party and was intended to provide the number of the population and two simple demographic data, births and deaths. This was also a complete failure.

In another country, study of village registers showed that certain villages were reported to have more than 50,000 calories per head daily, whereas others had only 200 !!! Thousands of examples of this type could be quoted.

The only possible and valid estimates are those based on objective data. It is necessary to count, to measure, to weigh, and so on. As it is quite out of the question to measure or to weigh everything, sample surveys must be carried out and consequently enumerators must be used who are trained in this type of skill. It is impossible for a person who has not learned how to use a compass and a surveyor's chain to assess the area of a field (and a fortiori of the area planted with such and such a crop in a village) in countries where there are no cadastres and sometimes not even geographical maps.

Certain problems like associated and successive crops, the analysis of family budgets, the study of statistics on nomadic populations are, in fact, very complex and could not under any circumstances be dealt with by staff not specially trained for such surveys.

It is pointed out that the developed countries, which have an administrative infrastructure that is much more dense and of higher quality, never use the method of registers, which would not give any additional degree of accuracy over sample surveys and would be much too expensive.

It therefore seems that in most cases, when projects are only local or are too small in scope to justify thorough statistical surveys, it will be necessary, in the absence of statistical documents, to decide solely on the basis of technological and accounting data and to recognize that certain investment projects are valuable for the development of small zones although it is unfortunately impossible to assess the individual impact of each of them on the economy of the country as a whole.

For those projects which, although devised, formulated and implemented at local level, have considerable importance politically, socially, economically or financially, it should be considered that the cost of statistical sample surveys based on objective physical measurement should as a matter of course be included in the total cost of the project, both for its formulation and the control of its implementation and effectiveness.