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1 STATISTICS AND DEVELOPMENT

The importance of numerical data for managing the business of governments, has been recognized for as long as societies have found it useful to develop institutions to achieve social, economic and political goals. The collection of information to support policy decision-making and day-to-day administration pre-dates the development of the modern science of statistics by hundreds of years. The Roman empire undertook regular censuses of the populations under their control, and there is evidence of statistical data collection in Minoan Crete and other ancient civilizations. The early development of mathematical tools of analysis was driven by the need to summarize data about societies for use by governments and other elements of administration. The word 'statistics' is derived from the German and in its earliest meaning was defined as 'tabulated numerical facts... relating to a state'. The modern science of statistics derives directly from the 'political arithmetic' of John Graunt and William Petty developed in Britain in the seventeenth century which was concerned with the use of demographic and economic data to support policy making, especially to support an efficient taxation system.

The establishment of government agencies with the specific responsibility for the collection, processing, analysis and dissemination of statistical data in Europe and America, dates from the nineteenth century, with an initial emphasis on the measurement of trade and other aspects of government concerned with taxation. In colonial countries, statistical development followed a similar pattern, with a concentration on the use of administrative data to manage the limited business of government. It is only relatively recently, within the past 50 years, that the modern concept of specialist statistical agencies concerned with almost all aspects of economic, social and political life has evolved. As the scope of government has expanded and, in particular, as the concept of development planning has become widely established, the need for ever more complex statistical data has led to almost all administrations carrying out some sort of statistical activity. A central statistical organization is now seen as

an essential part of modern government more or less regardless of political persuasion or the form of administration.

The justification for the emphasis on numerical information is based on two key assumptions. First, that by expressing information in the form of numbers a degree of precision and objectivity is obtained. Facts expressed in number form may be thought to be value free, that is the frame of reference does not depend on the observer. Second, numerical data may be manipulated and summarized using the powerful tools of statistics and mathematics. In particular, the tools of statistical analysis provide a means of making inferences and evaluating alternative decisions under conditions of uncertainty.

The strength of these arguments is illustrated by the increasing importance of statistics in almost all aspects of modern life. In the policy field, the continued willingness of governments to invest in the collection and analysis of numerical data indicates that at a certain level at least, the value of reliable and timely statistics are taken as given. In many developing countries, however, the performance of government statistical agencies (GSA) has been widely criticized, especially in the poor countries in sub-Saharan Africa. On the one hand, decision-makers and their advisers complain that the data they are need are either not available or, when they are published, are unreliable, are too late and are in a form which is not easy to use. On the other hand, the managers of GSAs point to inadequate and declining resources, to little or no feed-back from users and to very limited capacity for analysis and application. The data that are needed do not seem to be available and the data that are collected are not fully utilized. A number of commentators have analysed the reasons for this situation and have put forward various solutions (for example, Allen 1988; Corbett 1988; Eele 1990 and Lipton 1985). To a large extent, however, despite numerous international initiatives¹ (see following page for footnote 1) as well as bilateral aid programmes and other external support, it is difficult to identify much progress in recent years. If anything, the effectiveness of GSAs, especially in Africa, may well be declining. If the potential of reliable and

timely statistical data to support development is to be realized, it is important that the problems of organization, management and function of GSAs be identified and effective action taken to address deep-seated problems. This requires an analysis of the nature of statistical data and the development of an understanding of the processes whereby data are applied to decision-making. In particular, it will be important to ensure that GSAs are flexible enough to meet the rapidly changing conditions in developing countries, especially in response to the processes of adjustment, liberalization and democratic reform. While these processes have been the subject of considerable academic analysis, there is, as yet, very little discussion in the literature on the use of information in the changing policy environment or about the structure and function of GSAs.

2 THE FUNCTIONS OF GOVERNMENT STATISTICAL AGENCIES

The function of a GSA is to collect, process, analyse and disseminate official statistics. The justification for the expenditure of taxation revenue for this purpose is twofold. First, to provide the institutions of government themselves with the information required to support and improve decision-making. Second, to make available statistics on a variety of topics to agencies and individuals outside government, for many different purposes.

The first aim is to provide information to support the business of government, this includes a wide range of activities from day-to-day administration to long-term policy decision-making. The underlying assumption here is that better data, in the sense of more reliable, more timely and wider ranging, will lead to better decisions and hence to improved welfare. This paradigm sees official statistical data as objective facts that are policy neutral. Government statisticians are assumed to collect data and present it to ministers and their advisers in a dispassionate and objective manner.

The paradigm has been criticized on three main grounds. First, official statistics are not neutral nor necessarily objective, they are based on a large number of explicit and implicit assumptions and models which reflect the political, social and

economic world which generates them (Miles and Irvine 1979). Second, an over-emphasis on quantification results in a bias in decision-making which implies an often spurious accuracy to information expressed in the form of numbers compared with qualitative information that may well be more relevant and reliable (Seers 1977; Moore 1979). Third, the distinction between data collection and its use in the policy process results in a major gap between data users and data providers which hinders the policy process (Eele 1990). None of these authors are suggesting that governments should not collect or disseminate data, or at least information in the form of numerical summaries of the data. Rather they are concerned that the limitations as well as the advantages of expressing information in numerical form are recognized and that the links between the ways that the data are used and the method of collection and analysis are made explicit.

Most GSAs publish and disseminate some of the information they collect to the public at large, for example in the form of bulletins, digests and other kinds of reports. The purpose is to make available information to researchers, to producers and consumers and to individuals for a variety of purposes. In the developing world, this aspect of the work of GSAs is rarely given great prominence, although most countries do publish some material from time to time. It is argued below, that recent changes in many countries, especially the processes of economic adjustment, market reform and democratization, make this area much more important and it is one which will require greater attention in the future.

3 OFFICIAL STATISTICS AS A PUBLIC GOOD

The collection and analysis of official statistics as part of central government administration meet the criteria of a pure public good. Clearly everyone must 'consume' the same amount of a population census, for example (Varian 1990). Official statistics meet Abraham Lincoln's test that 'their collection and dissemination is a legitimate object of government because it needs to be done, but the people cannot do it by individual effort' (quoted in Samuelson 1951). The key elements that indicate the need for government action are: the

¹ For example, recent efforts to support the development of GSA's in Africa include: the United Nations Household Survey Capability Programme (UNHSCP); the World Bank's Living Standards

Measurement Study (LSMS) and the Social Dimensions of Adjustment (SDA) project; and the Statistical Training Programme for Africa (STPA) sponsored by the Economic Commission for Africa.

need for some kind of compulsion to support the collection of the raw data; and the difficulty private agents would have in collecting a price from all users.

The need for governments to fund statistical data collection is generally not controversial; the extent to which the objective should be to provide information for wider public use as opposed to its use for government business only has, however, provoked some considerable debate. To a large extent this debate has taken place in the context of the developed North, especially in Europe and the United States (McLennan 1993 and Fienberg 1991). The extremes are illustrated by two quotes from the British Government: '... we have always recognized that there are some services that only the public sector can provide. One such service is of course the provision of official economic statistics...official statistics are produced not just for government, but for the benefit of business and for the public at large.'²; and 'Information should not be collected primarily for publication. It should be collected primarily because government needs it for its own business'³.

Little or any of this debate has been translated to the development context, although many of the issues are directly relevant. The justification for continued expenditure on statistical services has been to produce information to support government business and the success or failure of GSAs has generally been judged purely on this criteria (for example, Duncan 1988). In part, this reflects the thinking that it is governments who do development; the role of information in strengthening the operations of markets and in promoting good governance has not been widely acknowledged (Silverman 1993; Eele 1993).

4 POLICY CHANGE AND THE DEMAND FOR INFORMATION

The nature of development and the role of the state especially in sub-Saharan Africa, but also in many other parts of the world have been undergoing a fundamental re-evaluation in recent years (World Bank 1989). Led by the international financial institutions and the donor community more widely, many countries have embarked on programmes of

adjustment and economic reform that have had and are still having far reaching consequences. What is surprising is that the role of information in this process has yet to be examined in detail. Where it has been discussed (for example, Demery, Ferroni and Grootaert 1993) the structures that generate the information have generally been treated as a given and there has been little or no discussion of the implications for the organization or management of GSAs. The move by governments away from direct participation in large areas of the economy and the increased reliance on market mechanisms to allocate scarce resources, have not been matched by any major change in the organizations that collect and process data nor in the kinds of information disseminated.

The process of reform and liberalization has implications for both the supply and demand for data. On the supply side, data sources will change and there will be less chance to rely on administrative processes to generate the required information. In particular, there is a need to develop mechanisms to collect data on the operation of different markets. On the demand side, the need is for data which can help monitor markets and identify when and how intervention is required, rather than to direct the processes of production and consumption. Table 1 provides an outline of some of the possible changes in five key areas: a reduction in the role of the state, especially a process of privatization; the liberalization of markets; decentralization of planning and decision-making; reductions in government expenditure; and moves to more democracy and openness in government.

If GSAs are to improve their effectiveness in a situation of decreasing real resources, then it is crucial that they respond to these changes and become more flexible in approach. In the context of small, open economies and greater integration into world markets resulting from the adjustment process, a key requirement for future policy will be the management of change. In both economic and social policy, the emphasis will be on two areas: the management of variability; and increasing the cost effectiveness of public sector interventions. These processes imply a need for information systems to generate current

² The Chancellor of the Exchequer, Mr Norman Lamont speaking at the annual dinner of the Confederation of British Industry in May 1992.

³ Sir Dereck Rayner in his review of the Government Statistical Service (HMG, 1981).

Table 1: Changes in the policy environment and the implications for statistical services

Components of the information system	Reduction in the role of the state	Liberalization of markets	Decentralization of decision-making	Reduction in government budgets	Moves to greater democracy
Policy issues and interventions	Less direction of economic activities, greater role for market interventions. Need to respond to shocks and surprises	Intervention in markets rather than direction, need to manage variability and respond to shocks and surprises	Local level decision-making and resource allocation	More emphasis on efficiency and cost reduction	Need to improve information flow to the public and to report on the impact of government policies
Forms of analysis	Need for understanding response of different population groups to changes in markets and macro conditions	Requires market models and understanding of how behaviour changes in response to changes in external conditions	Disaggregated models, local budgets etc	Cost-benefit analysis, understanding of opportunity cost of statistical activities	Simple analysis at least at local level
Data needs	Need for monitoring data and data to estimate market and household models. Official statistics also needed by private sector agencies	Need for monitoring data, rapid assessment, as well as data to estimate models. Data needed by market participants to improve effectiveness of competition	Disaggregated data as well as understanding of macro changes	Costs of data related activities and measures of benefits	Outcome indicators, other measures of progress
Data sources	Less reliance on administrative data, need to monitor market operations, need for rapid assessment data to monitor current conditions	Collection of data from independent agencies requires new collection systems, need to monitor prices. Less chance to use administrative data	Local level sources using simple techniques including community monitoring	Budgets, feedback from users	As for other areas, but with emphasis on the form of presentation

data which can provide early, or at least timely, warning of changes in trends and of shocks and surprises, together with base-line information which can be used to design interventions and to target spending. While there will still be a role for the 'traditional' formal, large-scale censuses and surveys, increasingly, the emphasis on timeliness will require greater use of more rapid data collection methods, especially those involving forms of rapid appraisal and other 'informal' techniques (Ward 1983).

The process of market liberalization and privatization has important implications for the ways that data are collected. In many cases, it will no longer be possible to rely on administrative data provided by government or parastatal agencies. There is an increasing need to develop mechanisms for collecting data from private sector agents, many of whom may well be operating within the informal sector at a low level of technology. Systems for collecting data on market operations are needed and this is an area where many developing countries have little or no experience. All this has to be done at a time when resources for statistical systems are very limited and are likely to decline even further.

5 STRENGTHENING STATISTICAL AGENCIES IN POOR COUNTRIES

The economic and political changes taking place in many developing countries are not only placing new demands for data on official information systems, they are also resulting in new roles for the information processes themselves. If the full benefits of official statistical systems are to be realized, then the previous emphasis on the collection of data for use within government has to be widened. In particular, attention must be given to the role of public information in promoting efficient markets. This is likely to involve an increasing role for the private sector both as a provider and user of data and there is a need to develop innovative mechanisms which can improve information flows at least cost. Greater attention will also need to be given to the role of official statistics in providing accountability to the public at large and in promoting the process of democratization at all levels. Official statistics are one of the main ways that the electorate has of assessing the performance of the government and of evaluating alternative policy platforms. A key issue here is how can GSAs present

complex economic and social data in a form that ordinary people can understand in order to make informed decisions. The need for a greater emphasis on communication of information and on explanation is becoming more apparent.

A useful framework for discussion is provided by breaking down information systems into their component parts. Figure 1⁴ (see next page), which is based on work undertaken by the Research Institute for Knowledge Systems in Maastricht, shows some of the links between the public and private sectors in the processes of data generation, data storage, retrieval and analysis, and decision-making.

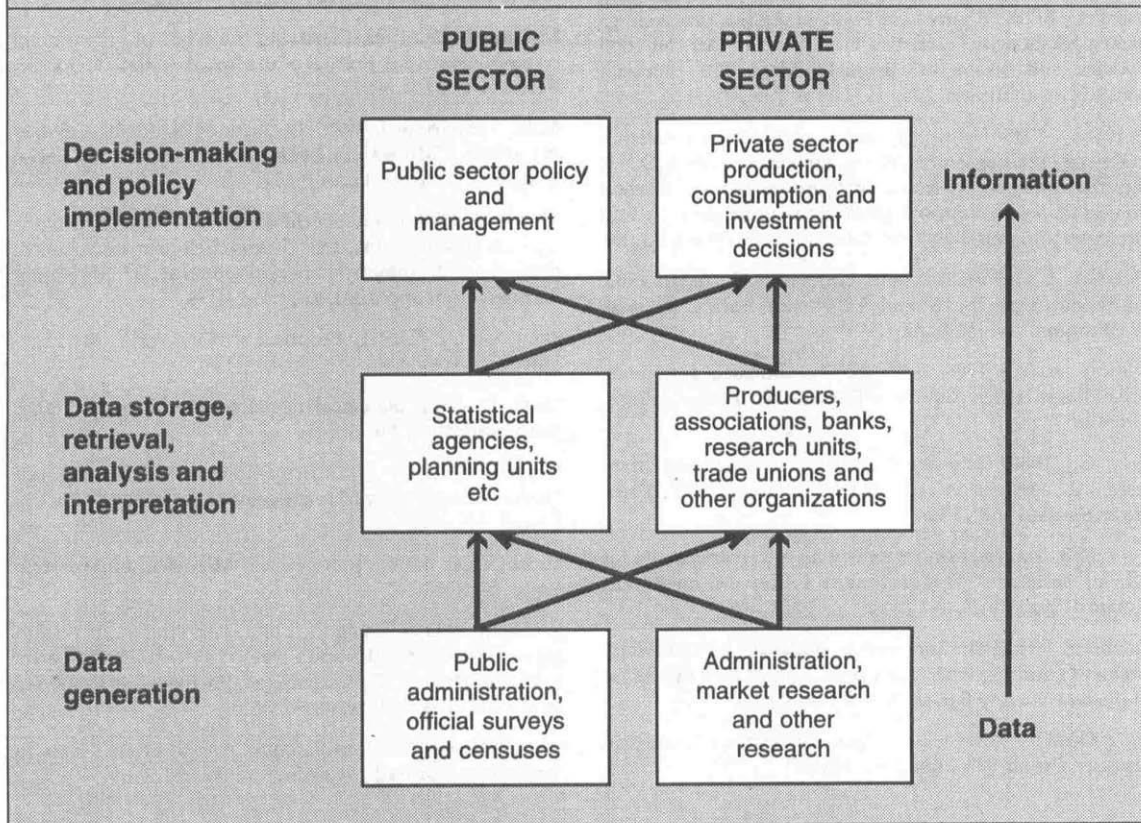
The purpose of Figure 1 is to indicate that public and private sector information systems are much more closely integrated than might otherwise have been thought. Data are generated in both the private and public sectors for a variety of uses. The processes of database management, involving data storage and retrieval as well as analysis and interpretation also take place in both sectors. In the private sector these kinds of activities are undertaken by producers associations, banks, trades unions and other organizations as well as by universities and research centres. Up to now, this type of activity has few links with public sector policy and management, although it may happen in some selected cases. The arrows between analysis and decision-making indicate that there is considerable potential for making more use of private sector agencies for this purpose. Similarly, private sector decisions, at least in part will be based on the output of public sector agencies concerned with information retrieval and analysis.

The promotion of the integration between public and private sector information systems will require a change of emphasis in the management of GSAs and in the activities they undertake. In poor developing countries, it is important that this change be recognized and supported by both governments and donors. Perhaps the most pressing need is for the recognition of the public role of official statistics and of the need to develop and sustain different channels for data collection, processing and analysis.

One important issue that will need to be resolved is that of centralized versus decentralized organizational structures for GSAs. Where the main objective is to support internal decision-making, then there is

¹ Figure 1 is taken from Eele (1993).

Figure 1: The links between public and private sector information systems



a strong argument for decentralizing information systems and integrating them as far as possible into the decision-making process. If, however, data are to be published and made publicly available, then the need for a centralized agency which can be seen to be independent and impartial is more apparent. If the public role of official statistics is to be promoted, then it will be important to ensure that GSAs have a considerable degree of independence and autonomy. If they are to be effective, GSAs must have the freedom to publish information even if it may be embarrassing to the government of the day.

Finally, and probably most importantly, much greater attention will need to be given to the issue of cost effectiveness of statistical activities. In most countries government budgets are being increasingly squeezed. Indeed it is ironic that the process of reform and adjustment which is placing new demands on official information systems is at the same

time resulting in fewer resources to meet these needs. Official statistical activities are not cheap, but while it is not too difficult to identify the costs involved, it is much more difficult to quantify the benefits of improved information. Indeed, the nature of statistical information as a public good more or less precludes a realistic price for different sets of data being arrived at by means of the operation of the forces of supply and demand. In the absence of price signals, alternative mechanisms are required to set priorities and decide between alternative activities. What is needed is a mechanism which not only includes the needs of government itself, but also the wider needs of the private sector and the public at large. A way of placing a value on the public good role of official statistics is required. Once priorities are established of course, it becomes important to ensure that they are adhered to. In the poorer countries it is especially important that donors support and not distort work programmes arrived at in this way.

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