

Statistics, Democracy and Development¹

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Abstract: Systematized information on the physical environment and its inhabitants helps to identify the needs of people and to measure the potential of any society. This is particularly relevant in the current global context where we are witnessing immense changes in the architecture of the world. Countries of all latitudes and organizations of all types have entered into processes of transformation, leading to their modernization. In Mexico, a wide-ranging reform gave rise to new demands for statistical and geographical information. Measures were taken to prepare the national information system to face the traditional and the new challenges. A modernization program for INEGI, Mexico's central statistical, geographical and informatics office was designed and implemented. This program comprises seven areas: decentralization, infrastructure, methodology, training, coordination, new products, and actions to promote a broader

statistical culture among the population. The contributions of INEGI's modernization program to the accomplishment of the national goals are briefly noted. A solid and updated information system promotes the extension of democratic participation and practices, helps in the design of policies aimed to promote economic development, and to improve people's living standards. It is concluded that, although statistical activities are technically and scientifically interesting, its fullest nobility may be found in helping nations provide justice and better well-being to their inhabitants.

Key words: Official statistics; world transformation; institutional modernization; National Information system; decentralization; infrastructure; methodology; training; new products, statistical culture; democracy; development; national goals.

1. Introduction

In this paper, I will concentrate on several aspects of Official Statistics and its contributions to democracy and socio-economic development. The objective is to reflect on the purpose of Official Statistics, the resources

allocated to it, and the benefits derived from this investment.

As it is known, the consistent reduction of financial resources in some regions, both in Official Statistics and in areas of statistical research and teaching, has become a point of increasing concern to the statistical profession. Hence, it is believed that, among other actions, the promotion of the role of statisticians, highlighting the useful work and positive contributions to modern society will help to motivate further interest in statistics and statisticians. The arguments

¹ This paper is a modified version of a lecture given at the plenary session of the 49th ISI meeting held in Cairo, Egypt, in September 1991. The lecture was dedicated to the memory of Dr. Prasanta Mahalanobis, former President of the Indian Statistical Institute and Honorary President of the ISI.

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and experiences presented here refer principally to Official Statistics and to the developing world. Yet, it is felt that they are not exclusive to the developing world.

In the first part, a brief historical perspective is given, and reference is made to the origins of Official Statistics in Hispanic America. Then, reflections are made on the current world situation and its influence on the role of statisticians. To follow, for the case of a Latin American country, Mexico, the effect that this situation has had on the structure and resources of the statistical system is analyzed. Finally, some considerations are presented on the contributions of statistics to democracy and development.

2. Official Statistics in Latin America

Several regions in the world have been the birthplace of ancestral and fertile civilizations. These cultures, like many others, have left us testimony that systematized information on the physical environment and its inhabitants helps to identify the needs of peoples, and to measure the potential of any society.

It is no wonder that nations give a high priority to knowledge of themselves and of their surroundings. Thanks to timely and accurate information, they can reduce the disadvantages of uncertainty and of a life dominated by chance. As we know, the statistical count, method and technique helps generate precious information with these valuable features.

As in other parts of the world, this has been recognized in Latin America since remote times. There is much evidence from the region's ancient cultures which shows their interest in statistical information as a matter of the state. We may recall, for instance, that the great civilizations which evolved on the American continent, a millennium ago,

such as the Aztecs, the Maya, Olmecs and Incas, were already carrying out systematic statistical studies. This is evidenced in codices and other historical documents which are now part of the international cultural heritage; moreover, near Mexico City there is a place with stone hills known as "*Nepohualco*" in Náhuatl or "*Contadero*" in Spanish, meaning "*Counting Place*." Existing hieroglyphs admit that the hills were built by the Chichimecas around the year 1000 A.C., with the stones deposited by each inhabitant of the region with the objective of doing a statistical count. Indeed, some consider this place to be a census data bank of the eleventh century.

With the arrival in America of Christopher Columbus in the year 1492, these American civilizations came into contact with the European cultures of the time. This event, called the "*encounter of two worlds*," led to an intense mutual influence in ways of being and of understanding the universe.

The statistical methods used by American Indians were also enriched in this flourishing. Indeed, during the post-Columbian period their procedures were complemented by those of the European authorities carrying out work in the compilation of statistics. Thus, new statistical methods and guidelines were born, with characteristics specific to the American region.

Later, as the countries began evolving from mainly agricultural societies towards increasingly industrial ones, governments throughout the newly-independent American nations established administrative units for Official Statistics. Their role would be, and was, to compile information systematically, as a basis for decision-making. It is thus no coincidence that many of the central statistical offices in the hemisphere were founded towards the end of the nineteenth century or the beginning of the twentieth.

Now, a thousand years after the first

systematic efforts to generate statistical information in Latin America, five centuries after the rise of European influence, and a century after the beginnings of wide industrialization, statistical information has become a crucial factor in the development of nations.

3. The World Transformation

The historical wealth of statistics, in America as in other regions, makes it one of the most ancient endeavors in the world. However, it is present circumstances which determine the strategic importance of our task, as statisticians at the awakening of a new millennium.

Recently, we have seen immense changes in the architecture of the world. Countries of all latitudes have entered into processes of transformation, in order to fulfill the needs of present-day life.

Millenarian societies, centuries old nations, recent independent states, union groups and political parties of all kinds are in the process of modernization. Rhythms, strategies and forms vary: in some cases, interest is centered in the extension of democratic processes; in others, in the creation of new economic markets; in still others, mechanisms are refined so as to allow for better social development.

This modernization phenomenon is generating a more interdependent and competitive world before which no one should remain indifferent. It is a context in which statisticians have an active role to play, as they have in other periods of marked historical importance.

In this world situation, no nation has its future guaranteed, and to fall behind is to opt for marginalization. That is why each country must channel efforts and define strategies, according to its own circum-

stances, so as to take full advantage of its potential.

As concerns Mexico, the modernization strategy is inscribed in the Government Program of President Salinas, summarized in the National Development Plan for 1989–1994.

The Plan's main premise is a wide-ranging political, economic and social reform. To support this process, an analysis was made of the changes required in the country's institutions. In particular these changes concerned public agencies and, specially, the statistical offices whose efficient operation was identified as an indispensable factor to achieve modernity.

4. Statistical Activity in Mexico

For these reasons, I would like to mention, briefly, some elements of official statistical work in Mexico to be able, later on, to describe how this has been modified to respond to a nation and a world in transformation.

In Mexico, Official Statistics are coordinated by the National Institute of Statistics, Geography and Informatics (INEGI). This currently includes a Presidency, six General Bureaus in the Central Offices³ and ten Regional Divisions, which allows it to service a population exceeding 82 million inhabitants, over a territory of two million square kilometers.

A first bureau of INEGI is the Central Bureau of Statistics which is Mexico's Statistical Office. It does, among many other projects, the Population, Housing, Economic, and Agricultural Censuses; and numerous establishment and household surveys. It elaborates the national accounts, the balance of trade, and many socio-economic

³ In June 1992, INEGI added a seventh General Bureau to elaborate the rural cadastre of the country hiring 30,000 personnel and allocating 1,000 million dollars to a three year project.

statistics. Also, this office coordinates the statistical work performed by state governments and other federal and private institutions, which in turn contribute to the National Statistical System.

A second component is the Central Bureau of Geography. This uses aerial photography, teledetection, remote sensing, and field activities to carry out ample geographical studies of Mexico, and to elaborate the country's basic and thematic cartography, covering hydrological, geological and edaphological aspects, as well as land use and the potential use of the territory.

It is worth noting that the incorporation of both Mexico's Central Statistical Office and the Bureau of Geographical Studies in one institution follows a millenarian tradition, offering great advantages in terms of ease and precision in referencing socio-economic information in its spatial dimension.

INEGI also includes the Government's Central Bureau of Informatics which establishes the Informatics development policy for Mexico; promotes the use of computers in state and municipal governments; and sets guidelines for the public sector's purchases of computer equipment and services. These are three of the six General Bureaus of the Institute.

The brief description of some of INEGI's central structure gives a general view of Official Statistical work in Mexico. But of more significance is the reflection of the challenges that this institution, as other similar institutions, will face in the early 1990s within a globalized and interdependent world, and with a country committed to its modernization.

5. Institutional Modernization

From the day President Salinas took office in 1988, he instructed INEGI to establish a

program to fulfill the demand for information which would grow, very quickly, as Mexico implemented a far-reaching reform.

Before defining the program's technical characteristics, the strategy sought to obtain, for statistical information, a high political priority, which would have to translate into a more solid budgetary support.

Despite the existence of a strict economic stabilization program which led to budget cuts in many government agencies and the restructuring of the public sector, INEGI's budget grew significantly. Actually, we might say that as part of the Reform of the State, public resources were re-allocated from non-priority areas (such as certain firms which were owned by the government) to consolidating strategic ones, like the production and diffusion of statistical information.

To give an idea of the intensity of this process one may note that, in 1988, the public sector in Mexico generated close to 20% of the Gross Domestic Product; by 1991, after the reduction of administrative areas and the privatization of the telephone company, the banks, airlines and other assets, this percentage was reduced to 16%. The sectors of activity of the state were thus re-defined and, among others, it designated statistical information as a high priority area for public action.

Thus, INEGI was able to consolidate current activities and to undertake new ones, all aimed at promoting institutional efficiency. It became embedded in the transformation process of the country, and defined and is implementing its own modernization program, so as to contribute to a wide-ranging reform in Mexico. This program granted political priority and support and includes some interesting aspects which I would like to briefly discuss to illustrate some of – no doubt – many options, that may effectively increase the role of statisticians.

5.1. Decentralization

A National Statistical System, in an efficient state, should produce information with a disaggregate geographical basis. Given the size of Mexico's territory, special efforts were required to move from a geographically centralized system to an alternative allowing more contact with information sources and users, at the regional and local levels. The modernization program thus included *decentralization* by strengthening the Institute's ten *regional divisions*. These are in charge of execution, field operations, processing and diffusion of the projects under the supervision of a Regional Director who represents INEGI before state governments. In the last two years, this regional structure has been consolidated and enriched by the creation, and now full operation, of 32 state level offices.

5.2. Infrastructure

A second aspect of modernization includes the *equipment* to carry out the work. As known, the scientific and technological revolution produces ever more powerful equipment at incredible speed to set up computer networks, teleprocessing systems, and instruments to interpret satellite images. This led to the undertaking of a diagnosis of our current equipment to move towards more advanced and proven technologies.

An important need for more equipment was identified and, as a result, 700 new personal computers were put into operation within specialized networks; the ten regional computer centers were linked via satellite; instruments were acquired to digitize cartography, and new photographic equipment was installed in INEGI's air fleet consisting of Lear jets for high altitude photography, and Cessnas for medium altitudes.

5.3. Methodologies

A third aspect of the program was an interinstitutional *review of methodology*. This allowed the thorough examination of the methods used and to further identify relevant areas not yet covered by Official Statistics. It led to new projects to support and enrich the national system, among which, we could cite a large study of the informal economy, the development of ecological accounts, the estimation of delinquency not reported to the judicial system, and an extensive study to evaluate the terminal efficiency and quality of the country's primary and secondary education.

It is worth noting that, in the task of methodological revision, the research done in academic institutions has played an important role. That is why very close contacts have been cultivated with the scientific and academic community.

In this regard, INEGI's support in re-establishing the Mexican Statistical Society in 1989 is of great significance. It now includes over 300 statistical professionals and represents an important advance in the development of statistics in our country and – we believe – in Latin America also.

5.4. Training

The *training* of its human resources is another component in INEGI's modernization process. Because employees are the principal assets they must be trained in a continuous fashion, not only to follow advances in work infrastructure and new methodologies, but also to stimulate their own full development.

With this goal in mind, a Training Program was established, supplementing university and technical education, which includes, among many courses, four diplomas of a 14-month duration. These began in 1990, and each is now recognized by the

Ministry for Public Education as a short professional degree.

5.5. *Coordination*

The Institute's current work goes beyond data production; it is also responsible for the *coordination* of a National Information System.

To this end, it has been important to increase statistical projects with all other Ministries and administrative sectors which, by law, need the approval of INEGI before the budgets of their projects are authorized. In this way, information is generated according to their own needs, but within a uniform conceptual framework.

Regarding the states, these sign yearly agreements with the Federal government in order to effect the transfer of federal budget resources. Recently, it became possible to include, in these agreements, a heading for projects on statistical and geographical information. This means that for each peso invested by a state in the generation of information, another will be given by the Federal government provided it is for a project carried out jointly with INEGI. This has allowed the undertaking of projects of great regional interest, thus strengthening and complementing the National Information System.

5.6. *New products*

The ample social changes and technological advances are generating a broader, more sophisticated range of information users, and it is important to identify their needs and to design products which satisfy them adequately. With this objective, INEGI has added to its structure an interdisciplinary area responsible for identification of data demand, technological monitoring, and the development of *new and better products*.

5.7. *Broader statistical culture*

All the aspects of the modernization program that have been mentioned so far, such as decentralization, work infrastructure, methodological revision, training, wider coordination and new products, are important in improving the information services.

However, these efforts would have limited effects, and would be insufficient, as long as sectors of the population do not know about the information generated, or are unable to use it in their own decision-making.

The studies we have done on the knowledge and use of statistical information in Mexico suggest that there are still segments of the population that are unaware of many of the figures or do not use them.

For instance, as regards population data, a non-negligible percentage of people was found who quoted population figures that the country would not attain for still another half a century, or that it ceased to have fifty years ago. This situation is not exclusive of this country; it holds in many regions of the world, as one can easily check. In fact, the main conclusion of these studies was that it is of utmost importance to advance towards a *greater sophistication in the use of statistical information*, which now constitutes one of our highest priorities.

It would seem that, despite the application of Twenty First century technology to produce information by agencies, important segments of society rarely use the data and when data are used, it is with obsolete methods.

Traditionally, we apply almost all budget resources to produce data, with little left for dissemination. That is why actions were undertaken not only to expand resources, but also to change the budget structure,

giving a well-deserved priority to dissemination. The area now in charge of this task is an additional General Bureau which has the same hierarchical rank as the other ones, such as the Central Bureau of Statistics or the Bureau of Geography. Also noteworthy is the fact that revenue from the sale of services now revert as extra budgetary resources to the Institute, and that they are almost fully re-invested into market research, definition of new products, and dissemination.

Dissemination measures include numerous exhibits, lectures, mass media campaigns, and projects coordinated with various sectors to increase the use of the information generated (for instance, with the educational system, it has been possible to include more references to statistical data in the official textbooks).

Though one feels encouraged by recent advances in dissemination, it is realized that the task before us is much greater than the achievements so far. For example, we could recognize that in the near future, illiteracy may not only refer to being unable to read and write, but it may also include a person's inability to use a computer and statistics in decision-making. Therefore, a new and wide literacy campaign might very well be needed in the new millennium and, in this, statisticians, and their professional organizations have an important role to play. This illustrates the size of the statistical culture promotion challenge.

6. Statistics, Democracy and Development

These are some measures recently taken to advance one of Mexico's priority areas in the 1990s: an efficient Public Service of Statistical Information. Of course, most of these measures are not new to our community and others require ongoing and per-

manent efforts. Yet, what is interesting is that these actions, defined as an integrated program have been simultaneously implemented with great political and financial support.

But perhaps a pertinent reflexion at this stage is to ask: What is the ultimate objective of these measures? Why has statistics been assigned as one of the activities of higher political priority? Or, in other words, what is the purpose in building a better statistical system? I believe these questions apply to all, but I will intend to give answers for the particular case of Mexico.

In referring to President Salinas's Government Program, we mentioned the National Development Plan. This sets the guidelines to advance in the modernization of Mexico. Its strategy is based upon three National Accords or Agreements: firstly, for the extension of democratic participation and practices; secondly, for economic recovery with price stability; and thirdly, for the improvement in the living standards of the people.

What is the contribution of statistics to the advances of these agreements which – in turn – promote Democracy, Economic Development and Social Justice?

6.1. *Agreement to extend democratic participation and practices*

Let us examine the first which is aimed at extending democratic practices.

The efficient dissemination of accurate statistical information helps in bringing about a better-informed society, with greater awareness of conditions and, therefore, greater ability to participate. In Mexico, as in many countries, the right to information is a constitutional mandate. The fulfillment of this requires disseminating objective, timely and clearly intelligible information. In this way, each individual may form his or

her own, reasoned opinion – which, in our view, is one of the necessary conditions for an effective democracy.

Society requires and demands ample information to form well-founded judgments regarding the performance of its leaders, institutions, and the country's overall progress. In this context, statistics can give a richer base, so that sectors and people make decisions and choose among the various options available in the matters that concern the life of the nation.

Thus, the responsibility of statistical offices is large, since their output contributes to the fulfillment of the right to information of the current inhabitants and, also, of the future generations.

In addition, statistical endeavors support democratic practices by using objective and scientific procedures to obtain official population figures. These make possible the demarcation of districts for the representation in the Federal and Local Congresses, which democratically legislate for the nation. In this way, representativeness may be fairly and justly implemented.

6.2. *Agreement for economic recovery with price stability*

As concerns the contribution of statistics to the second agreement, for economic recovery with price stability, it may be observed that the definition and implementation of policies, aiming at obtaining a greater production of goods and services, without inflation, need accurate and timely information. The adoption of fiscal, monetary, trade, wages, and financial policies, to mention only a few, require this as a crucial input. It is well known that without a solid statistical base, the conduct of economic policy would be pretty much left to the forces of chance.

In Mexico, the recent strategy to cut a very high inflation included, apart from the

orthodox measures of demand restraint, a social pact to temporarily control prices and wages. Therefore, the statistical system had to complement its projects in order to register possible shortages of products, which might arise from a stabilization program. Similarly, it was necessary to supplement the measures of price indexes, based upon various baskets of goods according to socio-economic levels and geographical zones. With these and other statistics, a weekly analysis is made of the evolution of various aspects of the economy to support the synchronization of the instruments of economic policy.

The demand for information from the private sector has also increased in recent times, in order to carry out productivity and competitiveness analyses in the face of free-trade agreements within the Americas. In this regard, data derived from the 1989 Economic Censuses and from various new Establishment Surveys has played a fundamental role in studying the possible effects that a more open commercial market might have at the sector and regional levels.

In sum, Mexico's heterodox economic stabilization program, to combat inflation and recover growth, has made special demands on new statistical projects. Some of these, given their importance, have become part of regular activities.

6.3. *Agreement to improve living standards*

The third agreement stipulated in the National Development Plan concerns the improvement of living standards. In this regard, social statistics covering the characteristics of jobs and unemployment, health, education and the environment, as well as public safety, poverty and housing conditions have allowed diagnoses which resulted in policies to alleviate shortages.

After almost a decade of economic crisis,

with low levels of public revenue and successive austerity measures, a number of social lags accumulated which had to be attended to. In 1989, a program to combat poverty was established: the National Solidarity Program, a novel system whereby funding is provided by the Federal and state governments, and also by the beneficiaries themselves, through their work or other inputs.

This Solidarity Program, which is the axis of Social Policy, represents a significant percentage of the federal budget. To implement it, it was necessary to have information which detected and identified exactly where the problems existed, and with what intensity. Information provided by the 1990 Population and Housing Census has proven extremely useful in this regard. This provides, given the new technology that was applied, data on small geographical units, covering a city block or group of blocks. Thus, the use of aggregate indicators which hold the risk of being unable to identify, specifically, the groups most in need of attention, is avoided. In this way the government insures that resources and subsidies reach the target population.

7. Results of the Strategy

The progress achieved in the above-mentioned areas for increased democracy, economic development and welfare gives the country more encouraging prospects than it had before.

Some results that justify these expectations can be mentioned. For instance: inflation has fallen from an annual rate of 180% in 1987 to a one-digit figure in 1992. In the area of public finance, a deficit of 16% of GDP in 1987 has been eliminated, obtaining, in fact, a fiscal surplus in 1991. In privatizing more than 50 of the public firms, it has been possible to reassert the state's

guiding role, and to encourage private-sector activity and capital repatriation. International reserves have reached the highest levels ever, and yearly GDP growth currently exceeds 3%. In turn, greater well-being has been achieved thanks to a larger and targeted budget for social development. In this phase of rapid change in Mexico, statistical information and the national statistical community have had a relevant and increasing participation.

8. Conclusion

Throughout history, statistical information has played an important role in the transformations undertaken by societies. Thanks to statistics we can comprehend reality, make a better use of our resources, and contribute to a better-informed society. Therefore, statistics are crucial in consolidating democracy and in promoting development.

At present, the statistical systems encompass advances which would have been unthinkable only a few years ago. Yet, given the new scenario, in which a rapidly changing world is emerging, it is necessary to double the efforts and to give a new impulse to our activity. In some cases, the recent reform of the state has given a good opportunity to re-value the high priority that statistical work deserves.

Certainly, our profession is methodologically interesting, technically challenging and scientifically fascinating. But I believe its truest beauty and nobility is to be found in its contribution to helping nations provide their inhabitants with justice and well-being. In my opinion, never before had statisticians a better opportunity and the technical resources to contribute to the attainment of these elevated goals.