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EXPERIENCE OF THE LATIN AMERICAN COUNTRIES IN CARRYING OUT  
THE 1963 PROGRAMME OF INDUSTRIAL CENSUSES

Prepared by the ECLA secretariat

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## INTRODUCTION

1. The purpose of this paper, which has been prepared for presentation to the Seminar on Industrial Statistics, is to study the experience of the Latin American countries in carrying out their latest industrial censuses or basic inquiries.
2. The requirements of economic and social development have subjected the statistical offices to increasing pressure, because of the growing need for as complete and up-to-date information as possible on the structure and activity of the economic sectors.
3. The industrial sector, which includes the mining, manufacturing, construction and electricity industries, is regarded as the hub of economic development, with the result that it is one of the sectors concerning which there has been so great an increase in the demand for statistical information in recent years. At the same time, the demand for information has increased because of the progress achieved in development planning.
4. Adequate industrial statistics presuppose the existence of an efficient system of inquiries, in which the periodic censuses, taken at least once every ten years, constitute the benchmarks and provide structural data while the more frequent inquiries - annual, quarterly or monthly - are the source of current statistics on sector activity.
5. It is clear, however, that organization, time and substantial resources will be needed to meet these requirements. There has been much discussion at statistical meetings concerning the extent to which national statistical offices have been able to meet these growing responsibilities.<sup>1/</sup> The purpose of this paper is not, therefore, to go once again into questions of general application, but merely to study the experience gained by the countries of the region in carrying out their latest industrial censuses or basic inquiries.

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<sup>1/</sup> Inter-American Statistical Institute, Factors affecting statistical development, paper presented to the IVth Inter-American Statistical Conference, Washington, 1962.

6. The importance of a study of census experience derives from the fact that, as is well known, censuses or basic inquiries are the point of departure and the benchmarks of the system, with the result that there is a close relationship between the efficient functioning of the system and the degree of accuracy with which the censuses reflect the structure and activity of the sector.

The industrial census situation in 1960

7. In order to establish a basis for comparison, it seems worthwhile to review the headway made by the countries of the region in carrying out industrial censuses or basic inquiries.

8. With the exception of a number of fairly complete industrial inquiries carried out by Argentina and Chile in 1914 and the years immediately following, inquiries which might be described as pioneer efforts, the first industrial "censuses" proper were not taken until the twenties and the thirties, when at least six countries - Argentina (1935), Brazil (1920, 1940), Chile (1928, 1937), Mexico (1930, 1935, 1940), Uruguay (1930, 1936) and Venezuela (1936) - conducted such censuses. However, this promising beginning did not lead to the hoped for continuation and expansion in the following decade; only the more industrialized countries continued to take manufacturing censuses - Argentina (1946, 1950), Brazil (1950) and Mexico (1945, 1950), the other three countries - Chile, Uruguay and Venezuela - being inactive during that period. On the other hand, two countries carried out industrial censuses for the first time: Colombia (1945) and Guatemala (1946).

9. There was no appreciable progress in census activity until the fifties, when the following countries carried out industrial censuses for the first time: Costa Rica (1950/51), the Dominican Republic (1955), Ecuador (1955), El Salvador (1951), Honduras (1950), Nicaragua (1953) and Paraguay (1955). In addition, manufacturing censuses were taken in Argentina (1954, 1958), Chile (1957), Colombia (1953), Costa Rica (1956/57), El Salvador (1956), Guatemala (1953), Honduras (1953), Mexico (1955) and Venezuela (1953).

/10. However,

10. However, listing the censuses or basic inquiries conducted is not in itself sufficient to describe the situation properly; some of the censuses referred to suffer from serious limitations because of the scarcity of resources and errors in the planning and execution of the different stages. In a few cases, the results were not even published, or were published years later in incomplete form and after laborious adjustments and corrections. With but few exceptions, coverage is far from complete, either because minimum limits were set for the statistical units included in the census or because of the large number of omissions due to failure to reply, which is characteristic of the attitude of respondents in countries with little experience or tradition of census taking.

11. As regards the frequency of the censuses, very few countries conducted industrial censuses periodically; Mexico and Brazil were the two most notable exceptions, taking censuses every five and ten years respectively. Argentina, too, although censuses were taken at less regular intervals, should be included in this group, and mention should be made of the five-yearly census programmes in Costa Rica and El Salvador after 1950.

#### History of the census programme

12. In response to the interest shown by a large number of countries and in view of the need for internationally comparable statistics, the United Nations Statistical Commission, at its tenth session held in 1958, recommended that Governments should compile basic data on industry for 1963 or a year close to 1963, "taking into account as far as possible the international recommendations on this subject which are designed to improve the international comparability of the data".<sup>2/</sup> Later, the Statistical Office of the United Nations published the recommendations on the 1963 World Programme of Basic Industrial Inquiries,<sup>3/</sup> approved by the

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<sup>2/</sup> Economic and Social Council resolution 676 B (XXVI).

<sup>3/</sup> Statistical Papers, Series M, No. 17, Rev. 1, Add.1.

Statistical Commission at its eleventh session in 1960. That paper sets forth the objectives of the 1963 World Programme, indicates the items of data to be gathered for compiling the required statistics and the kind of statistical and tabulating unit used in gathering and compiling these data, and defines the different topics proposed.

13. This World Programme was submitted to the different regions for their consideration and suggestions. Through an agreement between the Statistical Office of the United Nations and the Inter-American Statistical Institute (IASI), the latter submitted the proposed 1963 World Programme of Basic Industrial Inquiries to the American countries for their consideration and, later, COINS <sup>4/</sup> put forward the inter-American point of view. On that basis, the Census Subcommittee of COINS prepared a series of draft recommendations on economic censuses, which were approved by COINS at its seventh session at the end of 1960. These recommendations included separate census programmes for: (a) manufacturing and mining; (b) construction; (c) production and distribution of electricity; and (d) trade and services. Incorporated in these programmes were the definitions of the topics, the characteristics of the unit and the items of data which had been proposed in the World Programme of Basic Industrial Inquiries and in the international recommendations on distribution statistics.

14. The two programmes, the World Programme and the inter-American, provided the conceptual basis on which the countries of the region prepared their census programmes.

15. The Agency for International Development (AID) sponsored an eight-week workshop on economic censuses. This workshop was prepared by the United States Bureau of the Census and was held in San José, Costa Rica, from 11 February to 5 April 1963. Its purpose was to develop the various stages of an economic census programme for an imaginary country, from its planning and execution to the publication of results. "Since most of the countries conducting population, housing and economic censuses will be guided by the recommendations of the United Nations in developing their

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<sup>4/</sup> The IASI Committee on Improvement of National Statistics.

own concepts, definitions and table layouts, the study of a hypothetical model will effectively provide a conceptual and procedural framework that can be adapted for any country and used for teaching purposes."<sup>5/</sup>

16. The immediate forerunners of the national census programmes are then: the United Nations 1963 World Programme of Basic Industrial Inquiries, the IASI inter-American programme of economic censuses and the United States Bureau of the Census workshop on data processing for economic censuses.

#### Industrial census situation in 1965

17. According to information available to ECLA, sixteen countries of the region had conducted, were conducting, or were planning to conduct in the near future, censuses or basic industrial inquiries. In other words, but for Bolivia, Chile, Colombia, Cuba, Haiti, Honduras and Nicaragua, the other countries of the region, representing somewhat more than 80 per cent of the total population, had participated, or were planning to participate, in the 1963 census programme.

18. This considerable activity not only indicates that Governments had recognized the need for structural data on industry in order to plan and appraise their economic development policies, but also provides a good opportunity for evaluating the significance of the activities and the extent to which the desired objectives were attained.

19. A comparison of the over-all census situation in 1965 with that of 1960, clearly reveals that the progress achieved -- at least in the sixteen countries -- is quite considerable. It is therefore proposed to analyse the planning and the different operational stages of the censuses, in sufficient detail to provide the participants in the Seminar with a basis for discussing these aspects and for drawing conclusions which, based on the experience of the censuses under consideration, will be useful for similar programmes undertaken by the countries in the future.

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<sup>5/</sup> Providencia: A case study in economic censuses, U.S. Department of Commerce, Bureau of the Census.



## DEVELOPMENT OF THE 1963 NATIONAL CENSUS PROGRAMME

1. As indicated above, in the seven-year period 1960-1966 seventeen countries of the region have conducted, or are planning to conduct, censuses or basic inquiries on industrial activities.
2. The following pages describe the various aspects of each census programme, its individual peculiarities and differences; and in annex I some of the principal characteristics of industrial censuses and basic inquiries are summarized in tabular form.
3. The data given are derived, firstly, from an inquiry carried out by the Statistical Division of ECLA in the countries of the region by means of a special questionnaire, and, secondly, from visits to the national offices responsible for the census programmes and correspondence with a number of national officials.
4. With the exception of Jamaica, which conducted its basic inquiries taking 1960 and 1964 as its reference years, the remaining fifteen countries fall into the following groups, so far as the reference year of their censuses is concerned: five countries (Argentina, Paraguay, Peru, Trinidad and Tobago and Venezuela) in 1963; two (El Salvador and Panama) in 1961, and one in 1959 (Brazil), 1960 (Mexico), 1962/63 (Costa Rica), 1963 (Ecuador) and 1964/65 (Guatemala); finally, three countries (the Dominican Republic, Guyana and Uruguay) are planning to conduct censuses taking 1965 as the reference year for the data.

### Scope and coverage

5. It is significant that the seventeen countries under consideration included, or are planning to include, wholesale trade activities and services as well as manufacturing.
6. This broadening of the traditional scope of manufacturing censuses may stem from the desire to have information on the structure and activity of other economic sectors to meet the needs of economic planning, or it may equally be a result of the work of promotion undertaken by international bodies, particularly IASI through its 1963 Inter-American Economic Census Programme.

7. Only two countries, Guatemala and Paraguay, excluded mining from their census programmes because it is of little significance in their economies. However, even though this would also be a valid consideration in Costa Rica, El Salvador, Panama and Uruguay, the first three countries included mining within the scope of their censuses, and Uruguay is planning to do so. In the case of Panama, it was indicated that the census would cover stone and sand quarrying. Eleven of the seventeen countries under consideration included, or are planning to include, construction within the scope of their censuses, in spite of the difficulties presented by the coverage of this activity and the limited experience available. It should be emphasized that the United Nations described the inclusion of construction in the recommended programmes as optional and the programme proposed by IASI included only a census of construction enterprises proper.

8. Ten of the countries under consideration included the production and distribution of electricity within the scope of their censuses.

9. Finally, for the purposes of information, it should be mentioned that Guyana, Jamaica, Mexico, Trinidad and Tobago and Uruguay included transport in their census programmes. As regards the coverage of the censuses or inquiries, four countries (Argentina, Ecuador, Paraguay and Peru) indicated that they had not set any limits to the coverage; i.e., theoretically, all statistical units, regardless of size, location or other characteristics, were listed.

10. Brazil did not include in its manufacturing census processing activities carried out in agricultural establishments covered by the agricultural census, with the exception of sugar milling, sawmilling and the manufacture of wood-pulp; nor did it include individual activities or crafts. Work directly carried out by the public sector was not included in the construction census.

11. Costa Rica excluded cottage industry and El Salvador set a yearly output or sales figure of 1,000 colones as the minimum required for inclusion of an establishment in the census. Guatemala restricted the coverage to urban and suburban areas of the country.

/12. Guyana,

12. Guyana, Panama and Venezuela excluded from the scope of their censuses or inquiries certain areas of the interior that are of little importance in the activities covered.

13. In the electricity census, Mexico included only public utility enterprises.

14. Of interest is the way in which the manufacturing censuses treated the artisan and cottage industries. Some of the countries under consideration (Brazil, Ecuador, Panama and Trinidad and Tobago) indicated that they had excluded them from their censuses.

15. Argentina, Costa Rica, El Salvador, Guatemala, Peru and Venezuela included artisan activities under manufacturing according to the criterion of the size of the establishment, in terms of the number of persons engaged, output value and/or installed capacity. Consequently, no distinction was made between small manufacturing establishments and artisan workshops, except in the case of Mexico where all artisan workshops with a fixed and known place of business were included.

16. Guyana included the artisan and cottage industries, using the field visits made in connexion with the manpower survey as a basis for the selection of units.

17. Jamaica included in the scope of its inquiry straw products and other local wares, and the home production of articles of clothing.

18. Paraguay, for its part, included in its manufacturing census the production of cane-sugar syrup, oil of petitgrain, and other products such as handuñi, hammocks, etc., because of their importance in the economies of certain regions of the country.

#### Questionnaires and items of data requested

19. Annexes III, IV and V contain, in respect of the countries for which census questionnaires are available, lists of the items of data requested in the mining, manufacturing and electricity censuses respectively. For purposes of comparison and convenience of arrangement, the items recommended in the 1963 census programme are shown in the first column.

20. The following paragraphs deal solely with certain aspects that were not incorporated in the annexes, such as reference periods, the

/different ways

different ways in which countries dealt with certain items not covered by the general schema used as a model of comparison or, finally, details that might help to fill any gaps in the treatment of this subject.

21. (a) Mining. Of the four countries in respect of which specific census questionnaires on this industry are available, one (Venezuela) used the enterprise as the unit of enumeration and the other three used the establishment.

22. Basically, the information requested by the countries can be summarized under the following headings: (i) identification, location and characteristics of the unit; (ii) personnel engaged and wages and salaries; (iii) installed power equipment; (iv) inputs and expenditure; (v) output and receipts; (vi) stocks; and (vii) fixed assets. Among the characteristics of the unit, all four countries included a question on the legal constitution of the enterprise, and Peru and Venezuela added another on the economic organization.

23. The information requested on personnel engaged refers to a period of one day in the case of two countries, Argentina and Brazil, to one week in the case of Venezuela, and to four weeks in the middle of each quarter in the case of Peru. In addition, for the purpose of obtaining information on the pattern of seasonality of each industry, Argentina and Brazil requested the number of workers at the end of each month of the reference year.

24. One particular feature worth mentioning under this heading is the fact that Brazil requested the number of workers certified as having completed technical and professional courses and the total number of persons engaged, distinguishing between native-born Brazilians, naturalized Brazilians and foreigners.

25. In the wages and salaries chapter, Brazil added a table in which respondents were asked to indicate the number of persons engaged in one month classified in accordance with a scale of salaries and wages.

26. As can be seen from annex II, the inputs and expenditure chapter was treated in very much the same way by the countries under consideration. With the exception of Venezuela, all the countries requested information on the value of taxes and other current expenditure during the year. With

/regard to

regard to data on electricity consumed, Brazil requested a breakdown of consumption into three categories: power, lighting and other uses. Argentina established a similar distinction for fuels and lubricants consumed according to their use in the production of energy, heat and steam and for transport.

27. The output and receipts chapter was treated in exactly the same way by Argentina and Peru, the census questionnaires of both countries containing questions on quantity and value in respect of a pre-coded list of products obtained from the extraction of coal, iron ore, non-ferrous metals, petroleum and natural gas, limestone, stone and marble, salt, minerals used for manufacturing fertilizers, and non-metallic minerals. Brazil added a separate sheet to the questionnaire requesting the volume of products obtained, in terms of the quantity produced for own consumption, for others, and for entry into stock, and the quantity and value of products to be sold or to be transferred to other establishments within the same enterprise.

28. It is interesting to note that Argentina and Peru included in their census questionnaires a question designed to obtain information on production capacity. The respondents were asked to indicate the maximum quantity of principal products the unit could produce and/or the maximum amount of work it could do in terms of installed capacity.

29. Certain additional information was requested, over and above that referred to in the previous paragraphs. Argentina, for example, asked for information on the quantity of steam produced in tons/hour for generating electricity, for production processes and other uses. Brazil asked for information on the value, at the end of the year, of the accounts receivable, and included a chapter on the means of transport being used by the enterprise on the last day of the year, distinguishing between: (i) number and size of motor vehicles; (ii) number and gross tonnage of vessels; (iii) length of private railway lines in kilometres; and (iv) railway vehicles, number and capacity of engines and number and size of freight cars. Finally, Peru asked for proved, probable and possible reserves to be indicated.

30. (b) Manufacturing. The questionnaires used by twelve countries were available, and it is to those questionnaires that the description in annex IV of the topics included in the manufacturing censuses or basic inquiries refers. The comments in the following paragraphs are intended to supplement that annex.

31. It should be mentioned that three of the countries under consideration - El Salvador, Panamá and Perú - used reduced questionnaires for small statistical units, defined as units engaging fewer than five persons. Guatemala used a reduced questionnaire for non-accounting establishments, even though the reference period to which data for such establishments related was fixed at one month. Mexico, using a single questionnaire, indicated which questions should be answered by small statistical units, which were defined, in terms of size, as those units in which, on 31 December, between one and five persons were engaged or between one and ten if the industrial activity was directly derived from agriculture.

32. All twelve countries adopted the establishment as the statistical unit for their censuses; among the characteristics of the unit, they all included a question on the legal organization of the enterprise to which the establishment belonged, and all but three (Argentina, Brazil and Trinidad and Tobago) also requested information on the economic organization, i.e. the size and structure of enterprises possessing or controlling a number of establishments.

33. All the countries under consideration used a reference date (a day, a week or a pay period) in requesting information on the various categories of persons engaged, Mexico requiring information in respect of two dates, one at the end of each half-yearly period. In addition, for the purposes of obtaining some indication of the seasonability pattern of the activity, three countries asked for the number of workers engaged in each month of the reference year and five countries asked for the same information in respect of four dates, weeks or pay periods, one in each quarter.

34. As regards man-hours worked during the year, it is of interest to note that Mexico, in order to have some basis for checking the quality of the data on this topic, asked for yearly totals of (i) days worked, (ii) hours worked, (iii) man-days worked, and (iv) days not worked, with indication of cause. For the same purpose, Trinidad and Tobago asked for the number of workers on the first, second and third shifts.

35. The form in which data are requested on the capacity of prime movers and electric motors points to the way in which total installed capacity is likely to be computed. In effect, there are two possible alternatives: the first is to add the capacity of prime movers driving machines other than electric generators and the capacity of all electric motors, and the second is to add the capacity of all prime movers and the capacity of electric motors driven by purchased electricity. On the basis of the data requested, five countries opted for the first method, two for the second, two for both and one for neither.

36. Eight countries included questions on the value of fixed assets on a given date. Clearly this topic has to be considered in the light of national accounting practices and legislation. No uniform criterion can be established at the regional level for determining in relation to the sector as a whole a meaningful figure for the value of fixed assets. Although in theory the information sought is the current value (at the reference date) of the different categories of fixed assets, which would imply subtracting depreciation through wear and tear from the replacement value, these concepts are not always easy to define and it is even more difficult to obtain the relevant information; at all events, detailed instructions are needed to enable estimations to be made on the basis of a uniform criterion. To judge by the questions asked by some of the countries under consideration, the information sought was more the book value of fixed assets.

37. As a supplementary item under the heading of fixed assets, Trinidad and Tobago asked for the total amount paid during the year for renting premises, machinery and equipment, and the cost of replacing and repairing machinery, equipment and vehicles posted to the capital account.

38. Under the heading of purchase of electricity, Argentina and Brazil asked for a distinction to be made between purchases from public utility plants, plants belonging to the enterprise itself and plants belonging to other enterprises.

39. In the chapter on consumption expenditure, several countries added a special sheet for each industry to the questionnaire, listing the principal raw materials, while other merely left blanks for the respondent to fill in.

40. Brazil asked for information on raw materials consumed, broken down into: (i) those produced by the establishment itself; (ii) those received from third parties for processing; and (iii) those acquired or received by purchase or transfer. Quantity was requested for the first two categories, and quantity and value for the third. In addition, an extra column was included for the value of the stocks of the principal raw materials at the end of the reference year. Under this same heading, Argentina asked for a breakdown of the principal raw materials consumed into those belonging to the establishment itself (quantity and value) and those belonging to third parties and sent to the establishment for processing (quantity).

41. With regard to fuels and oils, Argentina asked for consumption figures according to use (power, heat and steam, transport and production of electricity), distinguishing between imported fuels and oils and those of domestic origin. This latter distinction was also made by Peru.

42. Five countries - Argentina, Guatemala, Paraguay, Peru and Venezuela - asked for separate information on expenditure during the year on maintenance and repairs; another country, Costa Rica, indicated that this information should be included in payments to others for industrial work done.

43. Most countries requested information, some requiring more detail than others, on expenditure on interest, rent, insurance, taxes, publicity, office overheads, etc. Argentina and Brazil also included expenditure during the year on employers' contributions, workers' compensation and severance pay.



44. For the section relating to output, a low level of aggregation was adopted by all the countries; the more highly industrialized appended an extra sheet to the questionnaire so that output during the reference year might be described in the fullest possible detail.

45. Argentina requested separate information on the quantity and value of products based on the establishment's own raw materials, and on the quantity of products based on raw materials that were the property of third parties.

46. Brazil asked for a breakdown by articles produced during the reference year for the enterprise's own consumption (quantity), on behalf of third parties (quantity), and for sale or transfer (quantity and value).

47. Some countries with more experience in the taking of industrial censuses such as Argentina and Mexico, for example, supplemented the questionnaire with an annex containing a pre-coded list of the main products of the activity concerned; while others, such as Brazil, distributed a pre-coded list of the main products of all manufacturing activities, so that the respondent might enter the name and code of those he manufactured and give data on the volume and value of production. Others again left lines in blank in this section of their questionnaires, so that each establishment might state the main articles produced and/or sold, and group the rest under the head of "other products".

48. Furthermore, it is worth noting that of the countries which applied the sales criterion in order to obtain output data, two - Brazil and Peru - tried to establish a breakdown of output by the destination of the products sold. Brazil asked for information on the value of sales or transfers to establishments belonging to the same firm as the respondent: (i) to the actual establishment concerned (including products incorporated into its capital); (ii) to other industrial establishments; (iii) to commercial establishments and those providing services; on the value of sales to consumers: (i) industries; (ii) government departments; and (iii) other consumers; on the value of sales to retailers; on the value of direct exports; and, lastly, on the value of free samples distributed. Peru used a similar classification by destination for sales values.

49. In this section some countries added questions designed to obtain information on other income accruing to the establishment during the year, as, for instance, from sales of waste or "seconds", and from interest payments received, commissions, dividends and subsidies.

50. The questionnaires prepared by some countries covered additional topics on which information might be useful. Since most of them are not included in international recommendations, it is worth-while to describe them in brief outline here.

51. Argentina requested data whereby "maximum production capacity" could be determined on the basis of the number of units of each product that the establishment had the "capacity" to produce and the number of unites actually manufactured. It also asked for information, in terms of tons per hour, on steam production during the year, broken down by uses (for the generation of electricity, for application in the production process and for other purposes).

52. Brazil included a question relating to the value of accounts receivable at the end of the reference year, and added a highly detailed section on the number and capacity or horsepower of the various transport media belonging to the respondent establishment.

53. Costa Rica added certain questions of a financial nature; for example, whether the capital of the establishment included any foreign investment, and what percentages of its working capital were financed from the following sources: national banks, private capital, foreign capital, funds of its own, and other financing. Information was also requested on the number of motorized and non-motorized vehicles owned by the respondent establishment. Guatemala requested data on sources of external financing as at the last day of the fiscal year.

54. Mexico appended a special section relating to the auxiliary units of the establishment, for which it requested information on activities undertaken, capital at a given date, power equipment installed and energy consumed, personnel engaged and wages paid, consumption of raw materials and lubricants, and work actually carried out.

55. Panama asked whether there was any foreign capital invested in the respondent establishment and, conversely, whether it had capital invested

/abroad; in

abroad; in an annex, moreover, establishments in which five or more persons were engaged were requested to supply information on their expansion plans for the next five-year period.

56. Peru, like Argentina added a table designed to obtain some indication of the establishment's "maximum production capacity".

57. Trinidad and Tobago inquired into the type of social security system or systems by which workers in the establishment were covered.

58. Venezuela requested information on the number of homeworkers engaged by the establishment, the area taken up by its plant and other facilities, the public utilities at its disposal, and, lastly, with respect to its auxiliary units, data on type, location, activities, personnel engaged and wages paid.

59. In the document on construction, which will be discussed in the context of another item on the Seminar agenda, an account is given of the topics on which information has been sought in countries where a census or basic inquiry has been undertaken in connexion with this activity. The reason why construction is dealt with separately from mining, manufacturing and production and distribution of electricity - the group of activities covered by industrial censuses - lies in the fact that the difficulties encountered in the field of construction are different from those arising in other sectors, and it seems more appropriate to consider construction censuses or basic inquiries, and the relevant experience of the various countries, together with current surveys of this activity.

60. (c) Electricity

The account given in annex V, which is completed by a few remarks formulated in the following paragraphs, is based on the questionnaires of the eight countries that took a census of this activity.

61. Of the countries considered, four (Argentina, El Salvador, Panama and Paraguay) adopted the establishment as the respondent unit; but in one case at least, the definition of the unit given seems to correspond to the enterprise. The other four countries (Brazil, Mexico, Peru and Venezuela) adopted the enterprise as the respondent unit.

62. In addition to the usual questions on the name and location of the respondent units, all the countries except Brazil inquired into the legal organization of the enterprise, and three countries - El Salvador, Paraguay and Venezuela - also included a question on its economic organization.

63. As regards the reference periods for data on personnel engaged, two countries (Argentina and Brazil) asked for the number of persons engaged as at a given day, while four (El Salvador, Panama, Paraguay and Venezuela) requested the same information for a specific week, and one (Mexico) for the last day of each half-year. Peru requested data on the number of persons engaged in four mid-quarterly weeks; these same reference periods were adopted by El Salvador and Panama for the number of employees and workers and by Venezuela for the number of workers. Argentina asked for information on the number of operatives or workers engaged in each month of the reference year.

64. With respect to salaries and wages paid to employees and workers during the reference year, four countries (Mexico, Panama, Peru and Venezuela) asked for the amount represented by social security contributions to be given as a separate figure.

65. It should be pointed out that the remaining countries, with the exception of El Salvador, requested information on the value of fixed assets as at a specific date.

66. As regards the questions designed to obtain information on equipment installed for the production, transmission and distribution of electric power, it seems desirable to describe them separately for each country, since on account of their complexity and the procedures adopted by the individual countries, it was impossible to enumerate them fully in annex V.

67. Argentina requested data on numbers of units and capacity for the following items of equipment: (i) prime movers for generators, broken down by steam engines, steam turbines, gas turbines, internal combustion engines and hydraulic turbines or water-wheels; (ii) generators, classified as AC or DC; (iii) electric motors, sub-divided in the same way; (iv) converters and/or rectifiers, from AC to DC and from DC to AC;

/(v) step-up

(v) step-up and step-down transformers and autotransformers. Separate data were requested for overhead and for underground transmission lines and networks on the length (in kilometres) of the transmission lines, high- and medium-voltage networks, and low-voltage networks.

68. Brazil divided up this topic into five sections, as follows:

(i) generating plant; (ii) high-voltage substations; (iii) high-voltage transmission lines; (iv) medium-voltage distribution substations; and (v) medium-voltage primary and low-voltage secondary distribution networks. Under the first head, in relation to prime movers and electric generators, a great many technical details were requested for each piece of equipment regarding its type and characteristics, length of time in operation and year of installation. In the second section, relating to transmission and inter-connexion substations, data were requested on the characteristics of transformers, disjunctors and frequency converters, and the type, capacity and voltage of current-converter substations. The third section contained questions on high-voltage main and branch lines, area served, length in kilometres, voltage, type of stanchion, etc. In the fourth section, relating to medium-voltage primary and low-voltage secondary distribution substations, information was requested on places served and on characteristics of transformers, condensers and converters in the case of primary distribution substations, and on places served, number and capacity of transformers installed, and voltages adopted, in that of secondary distribution substations. The fifth section was designed to obtain information on the main characteristics of the primary and secondary distribution networks.

69. El Salvador requested the following data: (i) number and capacity of prime movers, classified by type, in use and in reserve; (ii) number, and possibly capacity, of AC generators; (iii) under the head of transmission of electricity, voltages received and transmitted, number of transformers, and length of cables in kilometres; (iv) number of units, and transmission and distribution voltages, in the case of transmission and distribution stations and substations, respectively; and (v) under the head of distribution of electricity, the number of transformers, possibly their capacity, and the voltages received and distributed as well as the length of the cables in terms of kilometres.

70. Mexico included questions designed to ascertain the number and capacity of the following units: (i) prime movers, by type; (ii) 50- and 60-cycle AC generators and DC generators; (iii) transformers in generating plants, in receiving substations, in distribution substations and in overhead and underground distribution networks; and, lastly, the length (in kilometres) of transmission and distribution lines, classified by types of current and voltages.

71. Panama requested the following data: (i) number of units and capacity of prime movers coupled to generators (by types), of AC and DC electric generators, and of electric motors; (ii) number of units and capacity of transformers, in generating plants and in receiving substations, and length (in kilometres) and voltage of transmission lines; (iii) number of distribution substations, number and capacity of transformers installed, and length of distribution lines.

72. Paraguay divided the questions relating to equipment into two sections. In the first, under the head of technical characteristics of production, it requested information on the following points: (i) boilers installed, number, year of installation, steam production capacity and fuel used; (ii) prime movers, type, capacity, fuel used, number of hours in operation, and revolutions per minute; (iii) electric generators, number, year of installation, type, capacity, frequency, voltage, revolutions per minute and number of hours in operation. In the second section, on distribution, the information requested included the number of substations, number and capacity of transformers installed, voltage (primary and secondary), length of distribution lines (overhead and underground), and number, capacity and voltage of converter substations.

73. Peru incorporated questions designed to obtain information on the following points: (i) number and capacity of prime movers and electric generators, by types; (ii) number and capacity of transformers installed in generating plants; (iii) length of transmission lines, for different voltages; (iv) number of distribution stations and substations; (v) number and capacity of transformers installed in stations, in substations and in the network; (vi) length of distribution networks, for different voltages.

74. As regards installed equipment for the production of electricity, Venezuela confined itself to requesting data on the nominal and real capacity (in terms of kW or kva) of the prime movers installed, by types. With reference to transmission equipment, it asked for information on the number of substations, the capacity of the transformers and the length of the transmission lines; the same data were requested for distribution equipment.

75. Some of the countries added questions on other topics, which, although not included in international recommendations, were felt to be of interest. The following examples may be cited. Argentina requested data on (i) steam production during the year, in terms of tons per hour; (ii) number of meters installed and number of accounts dealt with, at the beginning and end of the reference year; (iii) amount represented by overheads; and (iv) ice output. Brazil inserted questions on the following points: (i) capital, reserves, long-term debt; (ii) expansion projects, classified by generating plants, substations, lines and networks, and by projects in process of execution and under study. Mexico requested data on (i) other expenditure (interest, rentals, royalties and publicity); (ii) other operational characteristics (demand at peak-load hours, average plant load, load factor and plant factor); (iii) auxiliary workshops. Panama asked for information on the months of maximum and minimum demand. Peru added questions on (i) volume and value of water consumption; maximum potential capacity of power stations in operation and under construction; (iii) characteristics of hydroelectric power stations; and (iv) daily peak demand in the months of maximum and of minimum demand. Lastly, Venezuela appended an annex requesting information on the number of persons engaged in a given week and the wages and salaries paid during the year by Federal enterprises.

#### Organization

76. An important aspect of the preparation and execution of the census or inquiry is the organization of the administrative and technical machinery of the office or offices responsible, and the choice of the method of enumeration to be adopted.

77. The census or inquiry was carried out by the National Statistical Office in all the countries except Paraguay, where the work was undertaken by an office other than the Department of Statistics and Censuses. As a rule, the taking of the censuses necessitated the strengthening or the establishment of a special section, and in most cases, the questionnaires and census material were prepared on the basis of discussion by a commission on which the bodies particularly concerned with the use of sectoral statistics were represented. This may account for the fact that in some instances the census questionnaires cover topics not included in international recommendations, in relation to which the existing stock of experience is not always adequate.

#### Enumeration

78. For the purposes of discussion at the Seminar, it will be useful to indicate the various procedures adopted by individual countries during the enumeration stage.

79. Argentina's economic census programme was in the hands of the National Department of Statistics; in those provinces which had a sufficiently well-organized and competent Department of Statistics, the National Department delegated a great many of its faculties, particularly in respect of supervision during the enumeration process and control and reception of questionnaires. The method adopted, as in previous censuses, consisted in using the State schools as centres for the smallest census area or "radius", and the teachers as enumerators; the respondent went to the school in his "radius", took away the questionnaire or questionnaires which he had to complete, according to his activities, and at a predetermined date returned them after filling in the information requested. Supervision and control was undertaken by the Provincial Departments of Statistics, wherever possible, or by officials from the National Department assigned to this work.

80. In Brazil's case, the Brazilian Institute of Geography and Statistics, through its own organization in the different States, supervised the distribution and reception of questionnaires by enumerators taken on ad hoc. It should be pointed out, however, that this census was

/organized on



organized on a different basis from the one taken in 1950 inasmuch as the Censuses Service personnel who took part in the 1960 programme were not dependent on the General Secretariat of the Institute. Furthermore, as the Censuses Service is a temporary unit within the Institute, its staff are offered no opportunity of a permanent career, with the result that the percentage of replacements is high, and new personnel are constantly having to be trained.

81. For the purpose of the census taken by Mexico, the country was divided into areas which in their turn were subdivided into sectors, and area representatives, sectoral representatives and census assistants or enumerators were appointed; this organizational machinery was under the control and supervision of the Department of Statistics. As in Argentina and Brazil, the self-enumeration method was adopted, but the enumerators delivered the questionnaires, fixed a deadline for their completion, and collected them when the time limit was up.

82. Some of the countries concerned (for instance, Costa Rica and El Salvador), using the organization of their own Departments of Statistics, engaged the services of enumerators for the census programme, who visited the establishments in their sector and filled in the information requested. Panama likewise adopted the method consisting in direct and complete enumeration of all the respondent units, by means of enumerators of whom about half were members of the permanent staff of the Statistical Office and the Ministry of Agriculture, Trade and Industry, and the remainder were taken ad hoc at a fixed salary. This same direct enumeration procedure was adopted by Paraguay for establishments in which fewer than 10 persons were engaged, by Peru for those with fewer than 5 persons engaged, and by Venezuela for those that kept no books.

83. Paraguay, Peru and Venezuela organized the enumeration on the basis of the appointment of departmental and district chiefs, and others at the various levels of the political and administrative organization of the country concerned, and these in their turn engaged enumerators locally, who received a fixed sum per questionnaire handed in. Their activities were confined to giving the respondents the appropriate questionnaires,

/together with

together with a brief explanation of the objectives of the census and the topics on which information was requested, and to receiving the questionnaires on the expiry of the appointed period.

84. A very few countries (Guyana, Jamaica and Trinidad and Tobago) resorted to the postal service for the distribution and reception of questionnaires, although in Guyana's case this method was combined with field work by enumerators, and in Trinidad and Tobago the use of the postal service was confined to urban areas, while in the rural areas the work was done by enumerators.

85. It may be of interest to mention the different lengths of time taken by the enumeration phase of the censuses or inquiries. The range of variations from one country to another is very wide; at the top of the scale stands Argentina, which reported that the enumeration had been completed in 4 days,<sup>6/</sup> followed by Mexico, where it took 45 days; next, in ascending order, come Peru (2 months), Panama and Venezuela (4 months), El Salvador (6 months), Costa Rica (7 months), Jamaica (9 months), Paraguay (15 months, of which 9 corresponded to the work of enumeration proper, and the subsequent year to re-enumeration and checking) and, lastly, Brazil (19 months, 12 of which must be discounted because work was at a standstill).

86. Of the countries that are planning to take an industrial census, Uruguay mentioned one month as the duration of this stage and Ecuador and Guatemala two months.

#### Methods and procedures

87. Obviously, the aim of an industrial census or basic inquiry is to obtain information on the structure and activity of all the statistical units that fall within its scope; but this objective can be attained either through full enumeration of every statistical unit, or on the basis of a sample of selected units, or, lastly, by means of an appropriate combination of these two methods.

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<sup>6/</sup> This figure no doubt relates to the period during which respondents had to fetch the census questionnaires they were to fill up.

88. According to the information furnished by the various countries, the great majority of those which have already carried out an industrial census or basic inquiry used the method of complete enumeration, and only two countries - Guyana and Jamaica - adopted that of complete enumeration in the case of large units and that of sampling in respect of small units, the latter defined in Guyana as those with fewer than 5 persons engaged, and in Jamaica as those with fewer than 15.

#### Industrial directory

89. Whatever the method of enumeration adopted, the success of this stage of the work largely depends upon the availability of a register or directory of the statistical units to be enumerated. As a preliminary to the taking of the census, this directory will have to be brought up to date, and will serve as a basis for estimating the volume of funds personnel and material that will be required, dividing up the grounds to be covered into sectors, distributing work assignments and keeping a check on the enumeration process.

90. Seven of the countries which carried out a census or basic inquiry - Argentina, Brazil, Costa Rica, Paraguay, Peru, Trinidad and Tobago, and Venezuela - reported that they had no permanent directory of statistical units and would need to prepare one for the purpose of the census; the other four - El Salvador, Jamaica, Mexico and Panama - stated that a permanent directory existed, and confined themselves to revising it and bringing it up to date for the census programme.

91. Of the five countries that are planning to take an industrial census in the near future, four (Ecuador, Guatemala, Guyana and Uruguay) said that they did not possess a directory, and one (the Dominican Republic) that it did.

92. The seven countries in the first group that had to prepare a directory sent enumerators to the various zones or sectors assigned to them, to complete a register of the name, location, and principal activity of the units, together with certain quantitative data such as the number of persons engaged and/or output or sales values. In addition to the field work, some countries used data from other sources to check the

/coverage of

coverage of the directory, availing themselves chiefly of current statistical records, tax declarations, telephone directories and lists of subscribers to social security institutions.

93. Three of the six countries that reported on the length of time taken to bring the directory up to date - Mexico, Paraguay and Venezuela - said they had needed three months while two others - Costa Rica and Jamaica - quoted four months, and one - Panama - seven months.

94. As regards the countries that are planning to take industrial censuses, Uruguay mentioned one month, Guatemala three months, and Ecuador six months, as the time they thought they would require for revision of the directory.

95. Few of the countries under study possess a legal instrument which permits or facilitates the maintenance of an up-to-date directory of industrial units. In El Salvador, every establishment whose capital amounts to 5,000 colones or more is obliged to apply for annual registration; in Mexico, under the Federal Statistics Act, all establishments engaged in any economic activity have to be registered annually by the Department of Statistics; and, lastly, in Panama all establishments are required to obtain an annual licence from the Ministry of Agriculture, Trade and Industry. A fourth country - Paraguay - is studying a project for the establishment of legislation under which annual registration will be compulsory for establishments engaged in economic activities. In Jamaica, limited liability companies have to be registered in the Office of the General Registrar. Elsewhere, it is hoped that the directory can be kept up to date on the basis of the administrative records of public, fiscal, municipal and social security institutions.

#### Training of personnel

96. Insufficient information is available for an evaluation of the training of personnel, which is another important aspect of the planning of a census, and affects all the different stages of its execution. But some indication of the degree and importance attached by the different countries to this part of the work can be derived from the time allocated to training courses, although with the reservation that in some instances the periods mentioned relate to the duration of successive courses given

/to different

to different groups of personnel and not to that of a single course. In Jamaica and Costa Rica, the training courses given lasted four and six days, respectively; in El Salvador and Panama, two weeks; in two countries - Brazil and Guatemala -, one month; in five countries - Ecuador, Paraguay, Peru, Uruguay and Venezuela -, two months; and, lastly, Mexico said that a period of three months had been devoted to the training of personnel.

#### Editing and coding

97. The aim of the preceding paragraphs was to give a brief outline of three stages in the taking of a census: revision of the directory, training of personnel and enumeration. But the degree of efficacy with which these phases of the programme are carried out, and the extent to which the topics investigated are the most appropriate, are largely reflected in the processes of editing and coding the questionnaires. The editing process constituted one of the most difficult and time-consuming phases of the census programmes carried out by the countries under review.

98. According to the available data, periods ranging from five to thirty-two months were required to complete the editing and coding of the questionnaires. The duration of this stage in the nine respondent countries was as follows: Paraguay, 5 months; Panama and Venezuela, 6 months; Mexico, 7 months; Costa Rica, 9 months; El Salvador and Peru, 10 months; Argentina, 21 months; and Brazil, 32 months.

99. In some countries, as the result of the editing process further interviews had to be conducted with the respondents, in order to complete or elucidate data in cases where it was impossible to do so in the office. In this connexion, one country - Argentina - said that among the industrial censuses, the mining census had elicited very inadequate information, and stated its intention of sending personnel to rectify the data obtained. In the manufacturing census, 8 per cent of the establishments failed to return the questionnaires, while 40 per cent of the questionnaires received contained inconsistencies which could not be set right by editing procedures, and the respondents had to be summoned (in writing or by telephone) to clarify or correct the information given. If the respondent did not appear in the office, one of the census personnel visited the establishment.

100. Panama remarked that the proportion of unanswered questionnaires was 5 per cent in the case of the manufacturing census (2 per cent in establishments in which 5 persons or more were engaged and 6 per cent in those with fewer than 5 persons) and about 14 per cent in the construction census. In the electricity census, coverage was considered to be complete.

101. Paraguay reported that for 10 per cent of the questionnaires no replies had come in, and that of those received for the manufacturing census, 36 per cent betrayed serious deficiencies; out of every 10 questionnaires in this group, 4 were adjusted in the office during the editing process, and to correct the remainder (approximately 1,200) further visits to the establishments had to be made.

102. In the case of Peru, 60 per cent of the manufacturing establishments located in Lima and Callao in which over 5 persons were engaged had to be revisited for the purpose of rectifying the omissions and inconsistencies discovered in the initial phase of the editing process; among these, 20 per cent of the questionnaires may be regarded as having been completed all over again.

103. Some countries said that during the editing process they had encountered very serious difficulties with respect to some of the topics on which information had been requested; in some instances, it was decided not to tabulate the data relating to such topics as the length of time the establishment had been in operation, its economic organization, the value of its fixed assets at a specific date, and its production capacity. Furthermore, one country pointed out that insufficient background material was available for the editing of certain data, such as those concerning employment categories at a low level of aggregation, and reference was made to the specific case of the classification of workers as skilled, semi-skilled and unskilled.

#### Classification of activities

104. Of the countries that have already taken a manufacturing census or are planning to do so, fifteen based the classification of the activities of the establishments on ISIC; one of them (Brazil) used a national classification different from ISIC but comparable with it.

105. Some countries mentioned that they had introduced slight changes in the classification of activities in order to adapt it to national requirements; thus, for example, Mexico made certain modifications in the groups relating to the textile and chemical industries and the manufacture of machinery, while Paraguay did the same in respect of some of the groups corresponding to the food and chemical industries.

106. Lastly, it should be pointed out that the countries whose national classifications of activities are to hand subdivided some of the ISIC three-digit groups into subgroups; how far these were satisfactory in practice cannot be ascertained until the tabulated results are available.

#### Tabulation

107. As regards the tabulation of results, nearly all the countries for which data are available utilized electronic computers for their manufacturing censuses, but in other censuses - mining, construction and electricity - these machines were used on a more limited scale.

108. Four countries - Brazil, Costa Rica, Peru and Venezuela - reported that electronic computers were being used for tabulating the results of all their censuses; four other countries - Argentina, El Salvador, Mexico and Panama - would be tabulating the results of their manufacturing censuses with electronic computers and those of other censuses by means of conventional electronic equipment, except for the mining census in El Salvador and Mexico and Panama's construction census which would also be tabulated with computers. Jamaica's mining census would be tabulated by manual means, while both conventional and manual equipment would be used for its manufacturing and construction censuses. Paraguay reported that the manufacturing census would be tabulated partly with conventional equipment and partly with an electronic computer; in Venezuela the preliminary results of the manufacturing census would be obtained by manual tabulation methods.

109. The estimated duration of the tabulating process also varies widely from country to country. El Salvador and Paraguay contemplate three months for this stage, Costa Rica four months, Mexico six months, Jamaica seven months, Peru ten months, Panama eleven months, Argentina and

/Venezuela twelve

Venezuela twelve months, and Brazil three years. It should be mentioned that in Brazil the Univac system was at a standstill for a whole year owing to a technical breakdown and this stoppage is included in the above period.

110. According to the constant data given in the preceding paragraph, all but two countries (Argentina and Peru, which expect to finish the tabulation process in the first few months of 1966) will have tabulated their census results in 1965.

#### Publication of results

111. Up to the time of writing, some results of industrial censuses or basic industrial inquiries have been published for seven countries (Brazil, El Salvador, Jamaica, Mexico, Panama, Paraguay and Peru). These publications range from book form giving the complete results to a single page summarizing a preliminary enumeration of the data for some of the major topics.

112. In September 1963, the Instituto Brasileiro de Geografia e Estatística (IBGE) issued in mimeographed form a comparison of the general results of the 1950 and 1960 industrial censuses for the whole of Brazil. Earlier issues had shown the over-all results for States and Territories, based directly on the data obtained from the tabulating machines. The published results for mining and manufacturing establishments, by groups and sub-groups of industries, and by Federal regions and units, are as follows: (i) number of establishments; (ii) monthly average number of operatives engaged; (iii) wages paid to operatives; (iv) total consumption expenditure; (v) value of output; and (vi) value added.

113. In December 1963, the Department of Statistics and Censuses in El Salvador published the preliminary results of the third industrial and trade census taken in 1961. In the section on industry, the information gathered on the construction enterprises covered by the census was set out in a table. The data presented for four sub-groups included: number of enterprises, number of persons engaged, wages and salaries paid, cost of construction materials used in 1961, cost of fuels and lubricants consumed, value of electricity purchased and generated in 1961, payments



to others during the year, receipts for construction work done or in process, value of fixed assets produced for own use, and value added during the inquiry year. The table also presents the following data for two sub-groups of establishments engaged in the generation and distribution of electric energy: number of establishments, number of persons engaged, wages and salaries, cost of fuels and lubricants, cost of repair and maintenance work, payments to others for plant, value of electricity sold during the year, value of fixed assets constructed for own use, and value added. In addition, for establishments included under manufacturing, a set of tables was published with the following data: number of establishments; number of persons engaged; wages and salaries paid; cost of raw materials used; cost of packaging materials and containers; cost of fuels and lubricants; cost of electric energy purchased; payments to others for work done; value of output; cost of contract, repair and other work; value of fixed assets constructed for own use; changes in stocks; and value added. These data are presented by (i) Department of El Salvador, (ii) major group and sub-group of activities, (iii) sub-group of activities for establishments engaging five persons and over, as well as those engaging four persons and under, and (iv) major group and Department, for the same two categories of establishments.

114. In February 1963, the Department of Statistics in Jamaica published a report on the 1960 survey of establishments engaged in industrial activities (mining, manufacturing and construction). The tables included therein are divided into two categories: (i) summary tables and figures presenting the main characteristics, by industry; (ii) tables for individual industries showing detailed data for the topics investigated. The data published relate to: (i) characteristics of the establishments or enterprises; (ii) number of workers engaged during a pay period, distinguishing between working proprietors, unpaid family workers, homeworkers, sub-contractors and employees, the last category being divided into managerial, supervisory and other workers; craftsmen, technicians and operatives; unskilled manual and service workers; and number of employees engaged during each month of the inquiry year; (iii) industrial and production costs; wages and salaries paid; materials

/and fuel;

and fuel; transport costs; maintenance expenses; taxes, interest charges and rent; and depreciation; (iv) total value of sales; (v) value of inventories at the beginning and end of the year, distinguishing between: raw materials and other similar commodities; semi-finished goods (i.e., work in progress) and finished goods; (vi) value of fixed assets held by the establishment, distinguishing machinery and equipment from land and buildings; (vii) capital investment in the following types of goods; new plant and machinery; new vehicles; other new equipment; second-hand equipment; land; buildings, purchased and constructed; exploration and land development; (viii) gross value of output; and (ix) value added.

115. In January 1963, the Statistical Department of Mexico's Ministry of Industry and Trade issued fifty-four mimeographed leaflets with the preliminary results for the main sub-groups (national subdivision of the ISIC groups) in mining and manufacturing. The data presented in three tables are classified by (i) larger establishments (employing six or more persons), smaller establishments, and auxiliary workshops; (ii) size of establishment according to the number of persons engaged; and (iii) Federal units. The data published relate to the following items: (i) number of establishments; (ii) fixed and working capital investment; (iii) value of output; (iv) number of persons engaged and, separately, number of employees, operatives, etc., by sex; (v) wages and salaries paid; (vi) social security contributions; (vii) consumption expenditure on: raw materials and supplies; containers and packaging materials; (viii) quantity of electricity consumed; (ix) cost of fuels and lubricants consumed; and (x) other expenditure. The printed volume containing the final results of Mexico's industrial censuses was completed on 15 June 1965. It is divided into six sections, the second of which presents thirty tables with data obtained from the mining and manufacturing censuses (privately owned establishments); the first six tables represent a summary of all establishments, and the remaining twenty-four relate to establishments engaging six or more persons. The data are presented by activity, by Federal unit, by activity and unit, by value of output category, by capital investment category, and by group of establishments according to the number of persons engaged. The third

/section relates

section relates to semi-public mining and manufacturing establishments and decentralized agencies. The fourth section presents twenty-one tables showing the results of the construction census; the first five tables relate to the main characteristics, classified by size of establishment, by construction value category, by capital investment category, by group of establishments according to the number of persons engaged, and by Federal unit; the next thirteen tables give detailed data classified by Federal unit, and the last three present data on construction materials and the value of construction work, by type. The fifth section presents eighteen tables showing the results of the census of public utility enterprises engaged in the generation and distribution of electricity. The sixth and last section deals with the petroleum census and consists of twelve tables with data for Petróleos Mexicanos (PEMEX) and fifteen other private concerns.

116. In August 1964, the Department of Statistics and Censuses, Office of the Comptroller, in Panama, published a single sheet with the general results obtained from the First National Industrial Census. It contained the following data for manufacturing establishments engaging five or more persons: (i) number of respondent establishments; (ii) average number of employees; (iii) total wages and salaries paid; (iv) man-hours worked by operatives; (v) gross increase in fixed assets; (vi) changes in stocks; (vii) total value of raw materials purchased, distinguishing domestic from imported; and (viii) total value of sales. These data are presented by ISIC groups. In addition, total figures were published under the following heads for all establishments (separately for those in which five or more persons and under five persons are engaged): (i) number of establishments enumerated; (ii) total number of persons engaged in August, distinguishing proprietors and active business partners; unpaid family and other workers; managerial, technical and clerical personnel; and operatives; (iii) average number of persons employed during the year, distinguishing managerial, technical and clerical personnel from operatives; (iv) wages and salaries paid to employees during the year; (v) fixed assets at 31 December, distinguishing between land, buildings and other structures; construction

work in process; machinery, production and office equipment, other equipment and vehicles; (vi) value of sales during the year; and (vii) cost of raw materials purchased during the year.

117. In September 1965, the Department of Statistics and Censuses, Ministry of Industry and Trade, in Paraguay, published the preliminary results of the 1963 Industrial Census (manufacturing and electricity). The relevant data cover: (i) number of establishments; (ii) total number of persons engaged and, separately, number of operatives; (iii) capacity of installed power equipment; (iv) average number of operatives; (v) wages and salaries paid during the year to operatives, and total paid to employees; (vi) total consumption expenditure during the year, and cost of raw materials; (vii) value of output; and (viii) value added. These data relate to establishments classified by location (urban or rural), legal organization, category of persons engaged, category of operatives engaged, category of power production capacity, category of wages paid to operatives, category of output value, group and sub-group of industries, and Department. Other tables are presented in relation to the same data with cross-classification of activities (groups of industries) by Department, activity and size of establishment, Asuncion and Departments according to type of activity, etc. Lastly, a table presents the following data classified by major group, group and sub-group of industries:

(i) number of establishments; (ii) consumption expenditure, distinguishing total costs, raw materials, fuels and lubricants, and electric energy; (iii) total value of output and receipts for industrial work done; and (iv) value added.

118. In the middle of 1965, the Statistical Department of the Planning Institute in Peru prepared a typewritten set of tables showing data for manufacturing establishments engaging five or more persons, covered by the 1963 Industrial Census. The data relate to the following items: (i) number of establishments; (ii) total number of persons engaged; (iii) number of operatives; (iv) total wages and salaries; (v) wages paid to operatives; (vi) capacity of power equipment installed; (vii) gross value of output; (viii) total cost of inputs; and (ix) value added. These data are presented in accordance with the following classification of establishments: (i) by ISIC major group; (ii) by ISIC group; (iii) by Department; (iv) by Department and ISIC major group; and (v) by ISIC major group of Department.

FACTORS AFFECTING THE IMPLEMENTATION OF  
THE CENSUS PROGRAMME

1. There is no doubt whatever that the success or failure of a census programme hinges on the care with which the various stages are prepared and executed; each and all of them are closely interrelated and form a sequence, so that the result of one stage is more or less directly dependent on the previous stages. It is therefore of interest to examine, even if only cursorily for want of information, the development of the various stages in the latest industrial censuses or basic industrial inquiries carried out in the Latin American countries. This examination will enable conclusions to be drawn for discussion by the participants in the Seminar.
2. The comments set forth in the following sections do not apply with equal force to all the countries that took part in the census programme, as detailed information is not available for some of them. Presumably, however, the above-described procedures and the type of problems confronting the countries for which there are data available are common to the majority and will therefore be useful as a basis for discussion.

Census organization and budget

3. In earlier sections a brief account was given of the organization existing in or adopted by several countries which had carried out censuses or basic inquiries. The following paragraphs, while completing that information, also set forth some relevant comments and problems that might be of interest.
4. In general, the decentralized system used in Argentina's census was useful in those provinces which have an efficient Department of Statistics, but it had a detrimental and retarding effect elsewhere. Moreover, the eagerness of some provinces to obtain census results before sending the material gathered to the National Statistical Department caused delays in the analysis and editing stages, and logically the work done at the provincial level was not available in time to shorten the work of the National Department. However, the provinces contributed substantially towards financing the programme; suffice it to say that during the inquiry

/year their

year their contribution represented 60 per cent of the total amount budgeted. To this monetary contribution must be added the assistance received from other public departments - as frequently happens in most countries - in terms of services, particularly the transport of census materials, the loan of vehicles to census personnel, etc.

5. It might be useful to stress a factor which is common to all the Latin American countries and may well have adversely affected the execution of the census programme in Argentina. The fact cannot be ignored that both tax declarations and replies to census questionnaires are made to departments of the same Ministry, and it is not known how far respondents are aware that the data supplied for the census are treated as strictly confidential.

6. Brazil's industrial census programme, which is part of the 1960 General Census, was beset by certain problems which delayed its completion. The mining, manufacturing construction and electricity censuses covered by the programme were properly prepared but, in general, their execution seems to have fraught with serious difficulties. In the first place, although the cost or estimated cost of the censuses is unknown since it is included in the aggregate cost of the over-all census, one of the factors which hampered the conduct of the censuses was the lack of resources; in fact, the shortage of funds held up the enumeration for nearly a year.

7. Another fairly important drawback may have been the fact that the National Census Service in charge of planning and carrying out the industrial census was no longer under the Secretariat of the IBGE as in the 1950 census programme. This circumstance may have prevented a more effective technical co-operation between the two institutions.

8. From the standpoint of financing, the Agency for International Development (AID) contributed 60 per cent of the budgeted cost of Paraguay's census programme.

9. Information is not available regarding the cost of the industrial censuses carried out in all the countries under consideration. Roughly speaking, the expenditure on the three-year census programme (enumeration year and immediately preceding and following years), comprising the trade

/and services

and services censuses as well as the industrial census, amounted to nearly 900,000 dollars converted at the average free market rate in Argentina, 147,000 in Costa Rica, 112,000 in El Salvador, 140,000 in Panama, 109,000 in Paraguay, 200,000 in Peru and a little over 1.5 million in Venezuela. The latter country explained that owing to certain financial and administrative problems which affected the conduct of its censuses in 1964 the cost of enumeration had risen considerably. It would have been interesting to establish a relationship between the above figures and the number of establishments covered by the census and thus to determine the approximate cost per questionnaire or per establishment, since such an indicator could be used for comparisons between countries. Unfortunately, however, the necessary information was not available in time.

10. In some of the countries considered, a centralized system of organization was adopted for the technical and administrative aspects and a decentralized system for the enumeration stage through the appointment of chiefs, representatives or inspectors in the larger political-administrative areas of the country, who in turn designated or suggested the designation of chiefs, representatives or inspectors in the smaller political-administrative areas, and so on to the appointment of local enumerators. However, this did not always prove to be the best system in some of the countries where it was used. Firstly, it was sometimes difficult to select the necessary personnel with sole regard for the interests of the census programme; secondly, as will be discussed later, such personnel received far from adequate training; moreover, it is not easy for administrative machinery of this kind to be controlled from the central office without an efficient and expeditious system of supervision.

11. In this respect, one country indicated that for want of funds to cover mobilization the officials appointed at each level had been unable to supervise the work of those at the level immediately beneath them; consequently, supervision had been limited to the possibilities and area of influence of the central office.

12. Some countries which used the decentralized system also attempted to carry out the enumeration simultaneously throughout the country. Although the advantages of such a method are well-known, they are not

/necessarily applicable

necessarily applicable in an industrial census. What is more, if supervision is inadequate simultaneous enumeration might jeopardize the success of the census programme.

Directory of statistical units

13. In an earlier section the position of countries carrying out industrial censuses or basic industrial inquiries was reviewed with respect to the availability of a directory or register of statistical units.

14. This directory - which should include all units in the industrial sector, contain a minimum quantity of information for each (location, type of activity, number of persons engaged and value of output), and be up to date in so far as it should reflect as nearly as possible the situation prevailing at the time of the census or inquiry - is an indispensable prerequisite for carrying out the programme.

15. In spite of the vital importance of the directory, not only for purposes of the census or basic inquiry but, more important still, for facilitating the operation of the whole integrated system of industrial statistics, few countries have a permanent directory of industrial statistical units and most of them, as mentioned before, either had to prepare a directory or bring the existing one up to date as part of the census programme. Obviously, no more than two or three persons are required to keep up a directory from administrative and business sources; but the work of preparing a directory for the first time or of bringing up to date one which had been compiled years before is one of the most time-consuming processes of a statistical programme and involves substantial resources.

16. It is to be hoped that the experience gained by the various countries in the implementation of their census programmes will enable them to keep up their directories and that the work done will be turned to account through the adoption of appropriate measures to ensure access to a complete and up-to-date directory whenever it is required.

17. Brazil stated that its permanent statistical services have a register of industrial, business and service establishments which was used to divide the enumeration into sectors and afterwards to check it; the



enumerators visited all the establishments in each sector. This directory is kept up to date through recourse to the records of new licences or cancellations of licences kept by the tax authorities.

18. The directory of statistical units in Mexico is based on that existing at the time of the previous census. This was gradually modified in line with the statements which have to be presented annually to the Statistical Department by all establishments engaged in an economic activity. Subsequently, in carrying out the population census, the enumerators took note of the names and addresses of all the establishments they found and this information, even though far from complete, was used to bring the existing directories up to date. In the industrial censuses the enumerators were provided with special sheets on which to record data about any units that were not included in the directories they had been given, and were instructed to eliminate from these directories any units that were not in their sectors. Nevertheless, the directories thus brought up to date could not be used in the enumeration because of various shortcomings as well as the particular nature of the enumeration, and in many cases served only as a guide or yardstick. Certain measures for keeping the directory up to date are currently under study, since it has been realized, in practice, that the relevant provisions in the Statistical Law fail to ensure complete coverage.

19. Panama's directory of establishments was based on the licences registered at the Ministry of Agriculture and Ministry of Trade and Industry, as well as on supplementary data from the Municipal Treasuries, the Social Security Fund and income tax statements to the Ministry of Finance. However, the data were insufficient to prepare the directory and a preliminary nation-wide enumeration had to be conducted for the purpose.

20. Peru had used the method of direct enumeration, with students as enumerators, to complete a directory of establishments as a basis for various censuses. However, in Lima and Callao the margin of error and omissions in the enumeration stage was such that it was decided not to use the directory in these two cities and the enumerators were compelled to visit every establishment in their respective sectors. There are no plans at present for keeping the directory of statistical units up to date.

21. In Paraguay there was no directory prior to the census and enumerators visited the whole of their sectors. A directory based on data obtained from the housing census and the inland revenue authorities served to check the enumeration and this comparison revealed the existence of some 3,000 new establishments which had not been enumerated. The directory obtained from the census is now available and it is hoped that a Law will be enacted to provide for keeping it up to date.

22. In Venezuela a new directory was prepared in the last three months of the year preceding the census enumeration and was brought up to date concurrently with this stage. Unfortunately, there is inadequate legal provision for keeping it up to date and the project prepared for the purpose by the Statistical Department has not been implemented for want of funds.

Questionnaires and materials - topics covered in the inquiry

23. Earlier sections dwelt on the forms used, with particular reference to the topics covered in the mining, manufacturing, construction and electricity censuses. The following observations relate essentially to specific details regarding the preparation of forms and other materials that might usefully supplement the information on these subjects which the participants in the Seminar may wish to examine.

24. The preparation of census questionnaires in Argentina involved laborious work over a period of several months, because 170 questionnaires were prepared on manufacturing, each with the code numbers and names of the principal raw materials consumed and products manufactured by every branch of industry. Brazil adopted a different procedure; together with the questionnaire on manufacturing and a separate blank sheet on which to set out the data for raw materials and products, it distributed a printed pamphlet with the names and code numbers of the principal raw materials and products, leaving the respondent to look up the names and code numbers according to his particular branch of industry and furnish the consumption and production data requested. Mexico prepared a single questionnaire for the manufacturing census, as well as 280 separate sheets, many of them containing the code numbers and names of the raw materials used and the

/products manufactured.

products manufactured. Thus, the enumerator delivered the questionnaire to the respondent together with the additional sheet of raw materials and products appropriate for his establishment. The remaining countries do not seem to have prepared special questionnaires or separate lists for the manufacturing census. No doubt owing to inexperience they preferred to leave a blank space for the items corresponding to the sections on consumption of raw materials and production by item, for processing by the central office in the editing and coding stage. The situation described above contrasts sharply with the considerable detail in which data were requested for specific topics. For example, in some countries the respondent is often left to use his own judgment as regards the categories used for the number of persons engaged if there is no proper legislation defining them. The value of staff classifications by sex and age in some of the censuses is none too clear, nor is it certain whether there are records that enable the respondents to answer questions as to the number of man-hours worked by operatives in construction or in the production of electricity. Another topic which seems to warrant further discussion is the value of the stock of fixed assets on a given date, which a good many countries included in their censuses. There are not enough background data at the moment to assess the reliability of these data, but there are definite signs that a general census or inquiry is not the best method for obtaining them. This observation is applicable to other questions regarding the financial situation of the enterprise or establishment, which were included in some countries. Likewise, as regards the questions concerning installed capacity asked by some countries in their manufacturing censuses, it would be as well to bear in mind that if the same equipment can be used to produce different items, obviously its capacity and the use of that capacity will vary for different combinations of products, and the question is valid only for establishments producing a single type of article. Conversely, except in one country, the manufacturing census questionnaires fail to elicit separate information for intermediate products and finished goods manufactured by the establishment; hence it is impossible to ascertain the output earmarked for the establishment's own use and, consequently, total domestic output.

A case in point is the production of yarn and thread by the textile industry; if the establishment possesses integrated spinning and weaving mills, there is a danger that the items produced by the establishment for its own use will be ignored unless these data are expressly requested in the raw materials and production sections of the questionnaire.

25. It is hoped that during the Seminar discussions it will be possible to compare the topics dealt with in the censuses with the published results. Such a comparison might well constitute one of the benchmarks for determining which of the topics were unsuitable. Unfortunately, it has been impossible to undertake this study as yet for want of information.

26. It is common knowledge that a simple, clear questionnaire with precise instructions for the principal questions (for experience has shown that most respondents read only the instructions readily at hand in the questionnaire itself) does much to facilitate the various stages of an industrial census. On the whole, the countries concerned have borne this fact strictly in mind and have prepared their questionnaires very carefully. There is, however, a risk that this very aim might be conducive to the adoption of a mode of inquiry or pattern of instructions for answering the questions which is unsuited to the conditions and accounting practice of a particular country. Therefore, trials should be carried out by means of limited field inquiries before a final version of the questionnaire is printed. Five countries - Argentina, Costa Rica, El Salvador, Panama and Paraguay - mentioned that they had carried out such inquiries.

27. In order to underline the importance of this stage, it might be useful to cite the following excerpt from a document presented at the First Seminar on Industrial Statistics for Latin America: "A major task in designing an effective questionnaire is translating basic concepts into the language of the businessman and breaking down economically meaningful but complex aggregates into a series of questions relating to specific items of data that would normally appear in business records. Bearing in mind the disparity in accounting practice from one enterprise to another and that the questions posed must be read and understood in the context

of accounting systems ranging from rudimentary to highly sophisticated, it is clear that translating a set of objectives into an effective questionnaire can be a difficult and time-consuming process." <sup>7/</sup>

28. Lastly, it should be mentioned that only two countries addressed separate questionnaires to the main offices of enterprises. In the other countries the data on personnel, wages and salaries, and type of activity of these main offices were presumably included in the mining, manufacturing, construction or electricity census questionnaires.

29. Besides questionnaires, the countries concerned prepared other census materials, including maps and charts of the areas and sectors, manuals for the use of enumerators, forms for checking the stages at the various levels, forms for controlling field expenses, codes, detailed instructions for the reception, editing, coding and tabulation of census questionnaires, etc. With minor differences between one country and another, these materials were adapted to the objectives pursued and, on the whole, were not a negative factor in the implementation of census programmes.

#### Co-ordination with the users of census data

30. If the main purpose of an industrial census is to meet the users' information needs, a logical aim should be to achieve proper co-ordination between the users and the office responsible for the census programme.

31. However, this co-ordination can have both its positive and its negative side. In the stage comprising the discussion of objectives and the design of questionnaires, for example, the users might propose the inclusion of topics on which information is important for their purposes but which are difficult to include or deal with in a census, in addition to raising the cost of the programme. On the other hand, their points of view are a help to the statistical office in gearing census aims to information needs. It is therefore necessary to strike a balance between information needs and the technical capacity and available resources of the statistical offices. Moreover, it should always be borne in mind

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<sup>7/</sup> Document ST/STAT/CONF.8/L.4, 12 August 1960.

that an industrial census is a highly complex undertaking but of interest to the whole country; therefore, the statistical office should seek the co-operation of other public and private agencies, and obviously the users, because of their own immediate interest in the programme, should be the first ones to offer it. This might prove useful not only in financing the programme and in the stages of promotion and preparation, but in the post-enumeration stages as well. Examples of such co-operation may be found in Argentina, where the census questionnaires were analysed and edited in offices other than the National Statistical Department. Likewise, the mining census is to be compiled by the Mining Economics Department of the National Mining Institute, and the electricity census will be edited and tabulated by the National Energy and Fuels Department. On the other hand, there are cases in which lack of co-operation on the part of the users might be the cause of serious deficiencies; thus, for example, some of the questionnaires used by countries in their construction and, in particular, electricity censuses reveal evident ignorance of technical details concerning the equipment and industry; this must surely have given rise to problems in the stages of enumeration and editing which could have been avoided through proper co-ordination with the national agencies responsible for the control or promotion of these activities.

#### Staffing problems

32. Earlier sections have touched on questions connected with the staff utilized in the census programme. In this respect, it would be useful to examine, on the one hand, the availability and experience of the permanent staff in the census office and, on the other, the problems involved in recruiting and training temporary staff.

33. Even though, as has been said before, it is impossible to determine which of the stages of preparation and execution of an industrial census is the most important in view of the close inter-relationship existing between them all, questions relating to staff are obviously of key significance and in some countries have been among the most difficult problems to solve.

34. In most of the countries considered, the Statistical Offices lack the permanent staff with sufficient experience in carrying out an industrial census, either because the Office itself has had no previous experience in that respect or because the staff members who took part in past programmes have since left for better paid positions, this being the crux of the whole problem of training statistical personnel, which has been discussed at other regional meetings on statistics.

35. Although staffing needs depend on the lines along which the census programme is organized (direct enumeration or inquiries by post, comprehensive enumeration of all units or sample surveys of small units, simultaneous or successive enumerations), it is quite clear that in any large-scale census or inquiry the permanent staff has to be reinforced with temporary personnel, whose training is one of the tasks meriting special consideration.

#### Technical and managerial personnel

36. As stated previously, it is vitally important that there should be an adequate group of technical personnel to prepare the census, and if the office responsible for the census programme has no such personnel available, at least in sufficient numbers, it should naturally seek the co-operation of personnel in other national agencies, in the form of technical commissions, to prepare and supervise the various stages in the process. This co-operation is all the more important inasmuch as a country's lack of experience has to be supplemented by the study of international recommendations and the experience of other countries. As some countries have proved, foreign techniques and experience cannot be applied unless they are adapted to the conditions prevailing in a country, and this process of adaptation is possible only if there is sufficient information available regarding the mode of operation used and the type of records kept by the statistical units covered by the census or basic inquiry.

/Enumerators

Enumerators

37. Mention has been made of the fact that in all countries carrying out industrial censuses it was necessary to recruit additional staff for the enumeration stage - including in some cases visits with a view to the preparation of the directory of statistical units - and for the analysis, editing, coding and tabulation of data. These persons obviously need to be properly trained for the stage or stages for which they were recruited. But because of the very fact that they are only temporary staff, they also require adequate supervision, especially during the enumeration process, and this means that the supervisors, in the approximate proportion of one to five or ten enumerators, should in their turn be given suitable training.

38. As also mentioned above, some countries held training courses in their capital cities for census personnel or supervisors operating in the major political-administrative areas. On returning to their own area or district these persons trained personnel at the level immediately beneath their own, and the process was repeated down to the level of the enumerators. One country stated that this system had not yielded the desired results, since as the successive stages of training developed the Statistical Office gradually lost control and the quality of the training itself deteriorated. Another country reported that training consisted in five-day theoretical courses for groups of candidates. Initially, certain requirements were insisted on and the first few groups trained, at any rate in the capital city, were students. Later, for lack of time and owing to other circumstances, the standard fell off. As a result of inadequate training, the enumerators' work was confined to delivering the questionnaires to the respondents and collecting them after a stipulated time, so that it was only in the capital city that the respondent could approach the Statistical Office for help on any doubtful point. One country said that outside the capital city an attempt had been made to use teachers to supervise the enumeration. The attempt had failed not only because they had not been properly trained but also because the month in which the enumeration was carried out had coincided with the mid-year

/school examinations,



school examinations, the school vacation and the national holiday period. Another country reported the interesting fact that for the sake of a more efficient control the enumeration had not been performed simultaneously in all provinces, but a team of approximately forty enumerators, half of whom were permanent staff members of the Census Department, had visited province after province until their work was completed. At least two countries referred to the serious problems they had encountered on account of the high replacement rate among temporary staff members whose experience was wasted because they normally left the Office as soon as an opportunity of more permanent employment presented itself.

39. Another country mentioned that the system of payment per questionnaire which had been used for the enumerators had proved unsatisfactory for want of proper supervision; some of the enumerators had been more interested in collecting as many questionnaires as possible than in the quality of the data supplied, to the point where some questionnaires had been found to contain fictitious data or information on non-existent establishments.

40. Whatever the enumeration method used, clearly one of the most important questions is the training of enumerators and supervisors. However, it might be as well to stress the fact, although self-evident, that there is a big difference in the level of training required for enumerators engaged in a population census compared with an industrial census. In the former, the emphasis is on the large body of enumerators required rather than on their training quality, though important, is not as vital owing to the relatively simple characteristics investigated. In an industrial census, on the other hand, the number of enumerators is not so important; it is quite impossible and there is no technical reason to complete the enumeration in one day, and it might easily take four to eight weeks according to circumstances; by contrast, the enumerator must be given sound technical and practical training if he is to solve the complex technical problems that arise during the enumeration.

/Enumeration of

Enumeration of statistical units

41. The methods used by the various countries in carrying out the enumeration, the time taken to complete this stage and the personnel taking part in it have been dealt with in earlier sections.
42. To sum up, it has been noted that in some countries, with slight variations, the census or basic inquiry questionnaires were completed by the respondents establishments themselves (self-enumeration), and in others by field staff during interviews with respondents. In the first case the questionnaires were distributed and collected in most countries by enumerators and in a few instances by mail. In countries adopting the second approach, the questionnaires were distributed and the enumeration completed by means of several visits to the respondents by field enumerators. Moreover, owing to problems connected with the directories of industrial units in some countries, the enumeration by field staff was combined with canvassing, i.e., the location and identification of establishments.
43. In countries with sufficient experience and a sound organization, the self-enumeration method is to be preferred, on the basis of a directory of large industrial units and through the centralized distribution and reception of questionnaires by post. This is by far the most economical method and, in view of the length and complexity of these particular questionnaires, the respondents need time to consult their accounting records and examine the situation and activities of various departments in their establishments before they can answer the questions correctly. In these cases, experience has shown that attempts by enumerators to complete the questionnaires are not always successful; even leaving aside the question of personnel training which was considered before, these interviews interfere with the establishments' normal activities and are likely to end in failure and, consequently, waste the time of both respondents and enumerators. Ultimately, the questionnaires have to be left with the respondents for completion or, worse still, the data obtained from these visits are worthless since the respondents have been forced to answer from memory without consulting their accounting records.

/To obviate

To obviate this, one country distributed a pamphlet among the respondents well before the date set for the enumeration requesting them to record periodically during the reference year the data which the census personnel staff was likely to require in the enumeration.

#### Small units

44. There seems to be no doubt that the location and enumeration of small units should be undertaken by field staff. In general, these respondents could not be expected to complete even simple questionnaires because, in the first place, they have no accounting records and even if they have they are very unreliable and, secondly, they not only lack the training to understand some of the questions asked but, what is more, they neither wish nor are willing to co-operate.

45. If the necessary data were available, they would certainly confirm the extremely high proportion of the census budget absorbed by the enumeration of small industrial establishments in many of the countries considered. The inclusion or exclusion of these establishments is not the point at issue; the question that ought to be discussed is whether or not the method adopted by the majority of the countries, i.e., direct field enumeration of all units - is the most suitable.

46. The question of the small units has been considered on other occasions, notably in international recommendations. Thus, for example, the seventh session of the IASI Committee on the Improvement of National Statistics (COINS), in preparing the inter-American economic census programme, stipulated in one of its general recommendations that in their manufacturing and mining censuses the countries should "... distinguish between 'large' and 'small' establishments on the basis of the number of persons engaged, classifying as 'large' establishments for purposes of international comparability those engaging ten or more persons". It further suggested a limited list of topics that should be covered in the census of small establishments, and requested the various countries to "... explore the possibility of applying the statistical sampling method ... in obtaining information on small establishments".<sup>8/</sup>

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8/ Inter-American Statistical Institute (IASI), Informe sobre la VII Sesión de la Comisión de Mejoramiento de las Estadísticas Nacionales.

47. The countries' experience in carrying out their industrial censuses shows that the recommendation to obtain data on small establishments by means of sampling is still fully applicable and that in most countries the direct enumeration of all establishments was not justified by results.

48. It has been argued that, on legal grounds, a country might be compelled to enumerate all units in a census. However, if account is taken of the saving which the use of probability sampling in the enumeration of small units represents in terms of money, staff and time, and if in addition it can be easily demonstrated that the data thus obtained from these units will undoubtedly be more accurate and comprehensive, since more time can be given to each respondent and the work of a smaller and better trained group of enumerators can be better controlled, quite possibly any argument to the contrary will be proved unfounded.

#### Editing, coding and tabulation of data

49. The cursory examination of the editing and coding of census questionnaires and of the tabulation of data made in previous sections provides sufficient grounds assuming that these processes should be included among the factors affecting the development of the industrial census programmes in the various countries. Consideration of their duration alone, as indicated by some of the countries, permits the assumption that these stages were not properly prepared or executed, even though, as mentioned previously, the problems encountered by countries in the editing of census questionnaires might have been the result of deficiencies in the enumeration and, in general, in the organization of the census.

50. The editing process - i.e., the discovery and correction of anomalies in the data contained in the questionnaires -, which can be carried out by checking them for omissions, analysing the consistency of data on the various topics covered by the questionnaire and comparing them with data from other establishments, from the same establishment in earlier censuses or inquiries, or from other sources, is one of the most delicate and complex processes in the census programme. All the shortcomings of census questionnaires - badly worded questions or obscure definitions -, the errors made by the respondent for want of proper records

/or with

or with the deliberate intention of providing false information, the mistakes of field staff during the enumeration, the possible influence of a well-conducted publicity and promotion campaign, and other factors - since this is by no means an exhaustive list - are reflected in and affect the editing process. Hence, the utmost importance should be ascribed to the training of personnel for this stage and to the preparation of clear and well-defined instructions detailing every step of the process.

51. Furthermore, it is common practice in some countries to prepare the tabulation plan when the editing and coding stage is nearing completion; it is only then discovered that certain questions or topics should never have been included in the census, either because of the unsatisfactory nature of the answers or the serious inconsistencies brought to light in editing, or simply because the data obtained could not be tabulated. Possibly in these cases the joint preparation of questionnaires and editing and tabulation plans would have meant an appreciable saving in time and resources and helped to simplify the various censuses processes.

52. As regards editing, some countries stated that this procedure had been limited to the scrutiny of questionnaires to make sure that all questions had been answered, and internal consistency checks of the various topics, but for want of a system of periodical inquiries and data from earlier censuses it had been impossible to make comparisons with data from other sources.

53. No fewer than three countries mentioned among the major obstacles to the implementation of their census programme the difficulties they had encountered in the editing of questionnaires because some of the questions had been left unanswered or because of the inconsistencies between data.

54. Reference was also made to certain difficulties that arose during the tabulation of data; one country's equipment had been at a standstill for a whole year owing to a technical breakdown while another country did not know whether the data would be tabulated by the Statistical Department itself or under contract by a private concern.

55. In this respect, a noteworthy arrangement had been made between two countries for the tabulation of industrial census results. One of the countries, whose census office lacked the necessary tabulation equipment, arranged to utilize that belonging to the Statistical Office of a neighbouring country under highly favourable terms. This type of bilateral agreement would no doubt be a more effective and economical solution for some countries than the costly installation or expansion of tabulation equipment.

#### Publication of results

56. According to the information available at the time of writing, only six countries had published some of the results of the censuses carried out under the 1963 programme. Brazil prepared a volume of tables on the major topics for the whole country and by States; at the end of 1963 El Salvador published the preliminary results of its industrial and trade census; in February 1963 Jamaica published the results of its basic mining, manufacturing and construction inquiries; early in 1965 Mexico prepared some preliminary results of its manufacturing census; Panama published the preliminary enumeration of data on number of persons engaged, wages and salaries paid and value of sales; in September 1965 Paraguay published the preliminary results of its manufacturing census; and in the middle of that year Peru prepared a preliminary summary of the manufacturing census results for the whole country; a few months before it had published in book form an 800-page directory of establishments engaging under five persons.

57. As regards the dates envisaged for the publication of results, four countries -- Argentina, Brazil, El Salvador and Mexico -- gave no indication at all, but Brazil expected to complete the tabulation process in the course of 1965. Costa Rica intended to publish the preliminary results in December 1965 and the final results in March 1966; Panama announced the publication of its results in December 1965; Peru spoke of March 1966 as the probable date of publication; and Venezuela expected to publish the preliminary results in July 1965 and the final results in the second half of 1966.

58. If the above information is taken as a yardstick, the countries concerned contemplate a period ranging from two to six years after the reference year before publication of the results. Obviously the value of the data also depends on the promptness with which they can be available. In particular the utilization of census results in evaluating the progress of industrial development plans might be seriously limited by the length of time between the census and the publication of results, especially if there is no system of more frequent inquiries, even of smaller coverage, to provide information on industrial activities in the intervening years.

## CONCLUSIONS

1. Until all the relevant information is available, it would be premature to come to any categorical conclusions concerning the success or failure of the programme of industrial censuses and basic inquiries in the countries of the region.
2. In considering the programme, it is, however, worthwhile distinguishing between, on the one hand, the actual experience gained by the countries as a result of the programme, and the practical objectives attained, on the other. Previous chapters of the paper described the participation of the countries in the programme and examined the way in which sixteen countries of the region carried out, or plan to carry out, industrial censuses. For some countries, this participation was their first experience in taking an industrial census, or at least their first in many years; it is clear that, for these countries in particular, the preparation and carrying out of an industrial census was of great significance, in that the programme measured the international recommendations and the experience of other countries against the realities of their own domestic situation. The experience gained in obtaining information on items of data not included in the international recommendations, in order to satisfy the needs of national users, must have been equally valuable. Consequently, in the light of the experience gained by the statistical offices in the different operational stages of the industrial censuses (organization, preparation of questionnaires and materials, training of personnel, industrial directory, enumeration, revision, editing, tabulation and publication), it is manifest that the census programme was a decisive step forward in improving industrial statistics in the region. On the other hand, the practical results, even allowing for the fact that complete information is not yet available, seem to have been more limited. If the programme is measured against the published data on the structure and activity of the industrial sector - to obtain which was the main purpose of the census or inquiry -, it is clear that for some countries the cost and the effort involved bear no relation to the results so far obtained.



Problems encountered

3. Although this paper is concerned solely with the programme of industrial censuses, it should not be forgotten that in all the countries under consideration these censuses were carried out in conjunction with censuses on wholesale and retail trade, services and, in certain countries, transport. For seven countries (Argentina, Brazil, El Salvador, Mexico, Panama, Peru and Venezuela) the programme of industrial censuses entailed taking four separate censuses, on mining, manufacturing, construction and electricity; for five countries (Ecuador, Guyana, Jamaica, Trinidad and Tobago and Uruguay) it entailed three censuses, for three countries (Costa Rica, the Dominican Republic and Paraguay) two, and only in the case of one country, Guatemala, was the industrial census limited to manufacturing. There is, therefore, every reason to wonder whether, in the first place, one of the reasons for the problems encountered in carrying out the programme is not connected with the over-ambitious scope of the censuses or basic inquiries.

4. Earlier in the paper it was stated with respect to economic censuses, that some of the countries under consideration lack what has been called "census experience and tradition". On the one hand, this tradition means having technical staff with experience in similar programmes and the necessary organization and resources in the statistical office, and, on the other, it supposes that there are satisfactory conditions for carrying out this type of programme, so far as the respondents and the general atmosphere of the country are concerned. These conditions can be reduced to two; the attitude of the respondents and their reaction to being required to fill in a questionnaire, which depends on their confidence in the use to which the data they are providing will be put and in the usefulness to them of the census results; and, secondly, the availability of accounting and other records complete enough to provide the information requested in the census or inquiry.

5. In some countries at least, the "experience and tradition" in the statistical offices is mainly in relation to population censuses, and it is apparent that this has had a decisive effect on the development of the

industrial census programme. An examination of some of the stages, particularly the training of personnel and enumeration, reveals that the organization and methods employed are similar to those used in a population census. The administrative pyramid - made up of different levels of personnel, from the enumerators of the smallest areas, supervisor, inspectors, area representatives, etc. to the central office - used in certain countries is certainly the same as that used in population censuses, and by means of that pyramid the training of personnel filters down from the vertex to the base and the data obtained are transmitted from the base to the vertex, in successive stages. But what remains to be proved in practice is whether this type of organization, used for a census in which a large number of people are involved, which has to be carried out simultaneously and in which great quantities of census questionnaires containing fairly rudimentary data are collected, is suitable for carrying out an industrial census.

6. As regards the attitude of the respondents, several countries mentioned, among the problems they had encountered, that respondents were reluctant to provide the data requested for fear that they would be used for tax purposes. This was particularly evident in one country where an investigation by tax inspectors was carried out at the same time as the census enumeration, and in another country where the census coincided with an announcement by the Government that it intended to carry out tax reforms in order to bring in more revenue under the head of taxes. In addition, it should be mentioned that some of the countries cited among the problems encountered the lack of accounting records in the statistical units. This problem should be considered in two lights: the inadequacy of the records for answering the questions put in the census, and the absence of records in the smaller reporting units. With regard to the first aspect, it might well be that limited inquiries in the field to test the suitability of the questionnaires would have gone a long way towards solving the problems, and, with regard to the second, the advantages of the sampling method over the complete enumeration method used were discussed earlier in the paper. These advantages are well known,

/particularly in

particularly in the case of the smaller industrial units, which cannot be expected to have accounting records that would enable them to provide information on the items of data requested in the census or inquiry.

7. Although it was not a general rule, some countries tried to use the industrial census to obtain as much information as possible from the reporting units. This attitude stems, of course, from the country's needs and from the desire to obtain the maximum benefit from the census, but, at the same time, it may have the effect of lengthening and complicating the questionnaire and, consequently, the later stages of the programme. This tendency to increased complexity may have even more serious consequence if some of the questions put are badly formulated or contain gross errors. Moreover, there is an undoubted need for reduced questionnaires for the smaller units, whatever the method of enumeration used, and for a special sheet or separate questionnaire for obtaining information from the central administrative offices. Finally, experience has shown that the question of the principal raw materials consumed and the main products manufactured cannot be left to the judgement of the respondents, in view of the problems encountered in editing questionnaires when there are no standard instructions on names and units of measurement.

8. There are very few countries that have a permanent office responsible for planning and carrying out censuses or basic inquiries, with the result that the staff participating in the census programme was employed on a temporary basis and, in some cases, received a somewhat sketchy training. Similarly, most countries have no directory or register of statistical units, and, where they do, no legal or practical provisions for keeping it up to date. Thus, if the situation is not remedied, every time an inquiry is made it will be necessary, as it was during the census programme, to bring up to date or prepare such a directory.

9. All the various problems encountered in some of the countries during the enumeration stemmed from those countries' desire that the enumeration should be complete, direct and simultaneous; complete in the sense that all the units included in the scope of the inquiry should be listed, direct in the sense that the information requested should be obtained through

interviews by the enumerators, and simultaneous in the sense that the enumeration should be carried out at the same time throughout the whole country and in as short a period as possible.

10. All the problems encountered in the different stages of planning and carrying out the census or basic inquiry were, as was to be expected, reflected in the editing of the questionnaires, with the result that in some countries this process was slow and difficult and, in some cases, insufficient to ensure the uniformity and quality of the data obtained. This in turn entailed further interviews with the respondents, which set back the time-table and increased the cost of the programme.

11. In some countries, the tabulation of the census results was beset by problems - over and above those deriving from the census itself - such as over-ambitious plans, deficiencies that went uncorrected during the editing of the questionnaires, etc., and certain additional difficulties connected with inexperience in operating electronic computers.

12. Finally, it is, therefore, easy to see why there has been such a long delay in the publication of the results in many countries.

#### Frequency of industrial censuses

13. This seems an appropriate point to consider the practical difficulties encountered by the countries with respect to the frequency of industrial censuses. As has been mentioned, COINS recommended that "economic", industrial, domestic trade and services censuses should preferably be carried out in years ending in 3 and 8, which amounts to recommending a census programme every five years; whereas the Statistical Office of the United Nations has on various occasions stated that industrial censuses or basic inquiries should be carried out at regular intervals, and not less than once every ten years.

14. To judge by the experience of the 1963 census programme in some of the countries under consideration, it would not seem practical to insist on a similar programme in 1968. Some of the national statistical offices do not seem to be sufficiently prepared to undertake so ambitious a programme; nor is there much hope that in so short a period there will be any change in the general atmosphere and traditions described earlier in

the paper. However, a programme limited to a basic manufacturing inquiry is a possible solution that participants in the Seminar might wish to discuss.

15. Moreover, it should not be forgotten that, in some countries, the census programme well nigh put a stop to continuing inquiries for a number of years; in other words, from the point of view of the users of industrial statistics, the supply of annual or more frequent data was replaced by the hope of obtaining fuller data once the censal process had been completed. It would therefore seem more appropriate to place the emphasis in the next few years on current industrial statistics.

#### The integrated system of industrial statistics

16. Reference should be made at this point to the integrated system of industrial statistics, which is the subject of another item on the Seminar's agenda. It should be emphasized, in the first place, that, in the light of the above survey of census experience and the practical difficulties in the countries concerned, that the census programme cannot replace the system but must, on the contrary, supplement it; in such a way that it should not only not interrupt the continuing inquiries but should make use of them and provide benchmarks for them. Only thus will it be possible to co-ordinate all the inquiries, both basic and continuing so as to achieve an integrated system. Such a system will enable countries to plan the different types of inquiries on a flexible basis and in accordance with available resources and practical needs and possibilities.

17. In this connexion, there is a certain amount of background material that might be of value when the operation of the system is revised. First of all, there is the material dealing with the items of data to be gathered and compiled in industrial inquiries which have been recommended by international bodies, such as chapter VI of Statistical Series for the Use of Less Developed Countries in Programmes of Economic and Social Development,<sup>9/</sup> and section VIII of the Inter-American Programme of

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<sup>9/</sup> Statistical Papers, Series M, No. 31, United Nations.

Basic Statistics (PIEB).<sup>10/</sup> In addition, there are other United Nations documents in which the frequency, scope and methods and procedures of industrial inquiries are examined. What matters is that all the industrial inquiries, whatever their frequency and scope, and the derived statistics, such as production indexes, should be planned and carried out in such a way as to form an organic and integrated system, made up, for example, of:

- (a) Monthly or quarterly inquiries (sub-samples of the annual inquiry) which give output data for the main products, with a view to calculating physical output indexes, and from which indicators on employment can be obtained;
- (b) Annual inquiries (basic inquiries sample) which provide fuller information on the sector and are used to correct and improve the monthly or quarterly inquiries;
- (c) Basic inquiries at regular intervals of more than one year (depending on the possibilities within the country) which constitute the benchmarks of the system; and
- (d) Occasional parallel inquiries for gathering items of data that cannot be included in those described above.

#### Summary of conclusions

18. In spite of the fact that the situation in all the countries taking industrial censuses was not identical and that, consequently, the conclusions presented below do not apply to some of them, it is possible to draw a number of general conclusions that could serve as guidelines in a discussion of any future programme, and they can be summarized as follows:

- (a) The industrial census must be planned and carried out with due regard to its importance, since it constitutes the benchmarks of the integrated system of industrial statistics on which the more frequent inquiries are based. It should not, however, be allowed to interfere with the functioning of the system.

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<sup>10/</sup> Report on the VIIIth session of COINS, Inter-American Statistical Institute.

(b) In spite of the possible advantages of carrying out the mining, manufacturing, construction and electricity censuses at the same time, experience seems to show that the statistical offices of certain countries are not in a position to solve, within the framework of a single programme, the particular problems presented in each of these censuses, particularly where the programme also includes trade and services censuses. Consequently, it should be determined in each particular case whether it would be appropriate to carry out the programme in successive stages or whether it would be possible to spread the responsibility for the post-enumeration stages among the various national bodies directly involved in the fields covered.

(c) Once the results obtained are available, the recommended programme for the construction and the production and distribution of electricity censuses should be reviewed. The particular characteristics of these industries and the problems encountered in practice warrant further study to determine the adequacy of the recommendations and national programmes.

(d) As regards the mining and manufacturing censuses, it would seem necessary to distinguish between establishments engaging fewer than ten persons (or some other suitable limit, depending on circumstances within the country) and those engaging ten or more, and to use different methods for each group.

(e) It is indispensable that steps should be taken to ensure that the directory of establishments engaging more than ten persons is kept up to date. If possible, in some countries the limitation of size for including establishments in the directory could be reduced to five or fewer persons engaged.

(f) As regards the preparation of questionnaires, the following separate questionnaires should be available: (i) a general questionnaire for establishments engaging ten or more persons, with separate sheets to be filled in with the name, relevant code and unit of measurement of the principal raw materials consumed, or bought, and the principal products manufactured, or shipped. In countries with less experience, it would perhaps be preferable to begin by limiting these supplementary sheets to

/the main

the main groups (three-digit groups of the ISIC) before including the remaining groups and the most important sub-groups; (ii) a reduced questionnaire for establishments engaging fewer than ten persons; and (iii) an additional questionnaire for the administrative offices and, where justified, for auxiliary units. The suitability of all this material should be tested in the field before being used in the census.

(g) With regard to the enumeration of establishments, consideration should be given to the possibility of using the postal method for the complete enumeration of establishments engaging ten or more persons (or some other agreed limit) and the direct enumeration method for a sample of establishments engaging fewer than ten.

(h) The possibility should be studied of maintaining a permanent office for carrying out both the basic and more frequent industrial censuses, and of taking steps to ensure that technical personnel for planning and carrying out the different stages are available. If the country does not have adequate regional offices, the enumerators should basically consist of the permanent staff of the central office, and in some countries the enumeration could be carried out in each of the major political and administrative divisions successively.

(i) Certain topics, such as those relating to the level of skill of the industrial labour force, the technical aspects of operation, details of machinery and equipment, stocks of fixed assets, investment plans of the enterprise, credit conditions and financial aspects, should be the subject of special inquiries and should not be included in the general inquiry.

(j) Plans for editing, tabulating and publishing the results should be made during the preparatory stage of the basic census or inquiry, and steps should be taken to ensure that these stages are carried out in appropriate and timely fashion. The same applies to the more frequent inquiries.



1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration or corporate governance. The text suggests that without reliable records, it becomes difficult to track progress, identify issues, and ensure that resources are being used effectively.

2. The second part of the document addresses the challenges associated with data collection and analysis. It notes that while modern technology offers powerful tools for gathering and processing information, the quality and consistency of the data can vary significantly. The author highlights the need for standardized protocols and rigorous quality control measures to ensure that the data being used is accurate and relevant. Additionally, the text mentions the importance of training personnel to use these tools correctly and to interpret the results in a meaningful way.

3. The third part of the document focuses on the role of communication in the overall process. It argues that effective communication is crucial for ensuring that all stakeholders are informed and engaged. This includes regular updates, clear reporting, and open channels for feedback. The text suggests that good communication can help to build trust, resolve conflicts, and foster a collaborative environment where everyone is working towards the same goals.

4. The fourth part of the document discusses the importance of flexibility and adaptability. It notes that circumstances can change rapidly, and it is essential to be able to adjust plans and strategies as needed. The author emphasizes that a rigid, one-size-fits-all approach is often ineffective, and that organizations must be able to respond quickly and effectively to new challenges and opportunities. This requires a culture of innovation and a willingness to experiment and learn from failure.

5. The fifth part of the document concludes by summarizing the key points and offering some final thoughts. It reiterates the importance of accuracy, quality, communication, and flexibility, and suggests that these are the foundations of a successful and sustainable organization. The text ends with a call to action, encouraging readers to take these principles to heart and apply them in their own work.

## INDUSTRIAL CENSUSES: GENERAL CHARACTERISTICS

Country	Censuses or inquiries A: Executed or under way B: Planned	Reference year	Scope	Coverage or classification criterion	Statistical unit	Questionnaires	Directory of statistical units	Method of enumeration
Argentina	A	1963	1, 2-3, 511	Unlimited coverage	Establishment	2-3: One for each sub-group of activity 1 and 511: One for each sector.	Non-permanent Based on information from related Government bodies	Self-enumeration; distribution and collection of questionnaires by enumerators
Brazil	A	1959	1, 2-3, 511	(1) Excluding individual activities (2) Establishments in operation but not those in process of organization	Establishment (1)	One for each sector	Non-permanent Based on updated real estate records and tax permits	Self-enumeration; distribution and collection of questionnaires by enumerators
Costa Rica	A	1962-63	2-3	Unlimited coverage	Establishment	One	Non-permanent Based on information obtained through visits to all statistical units	Distribution, completion and collection of questionnaires by enumerators
Ecuador	B	1964	1, 2-3	Unlimited coverage	Establishment		Non-permanent	Distribution, completion and collection of questionnaires by enumerators
El Salvador	A	1961	2-3, 511	2-3: Unlimited coverage 511: All public utility plants (generating and distributing)	Establishment	2-3: One for establishments of up to 4 persons and others for establishments of 5 or more 511: One only	Permanent Registration in the National Directory of Establishments prior to the issue of trade licences	Distribution, completion and collection of questionnaires by enumerators
Guatemala	A	1964	2-3	Unlimited coverage	Establishment	Different questionnaires for accounting and non-accounting establishments	Non-permanent Based on information obtained through visits to statistical units	(1) Distribution of questionnaires by mail and collection by enumerators in the case of accounting enterprises (2) Distribution, completion and collection of questionnaires by enumerators in the case of non-accounting enterprises
Guyana	B	1965	1, 2-3, 511	Unlimited coverage	Establishment		Non-permanent to be based on the findings of current manpower inquiries	Self-enumeration, by enumerators and by post
Jamaica	A	1960	1, 2-3	Unlimited coverage	Establishment	One only	Permanent Based on information obtained through field visits and from the records of limited liability companies	Distribution, completion and collection of questionnaires by enumerators inquiries by post as well
Mexico	A	1960	2-3, 511	2-3: Unlimited coverage 511: Public utility generating and resale enterprises	Establishment	2-3: One questionnaire distinguishing between establishments of 5 persons or more and those up to 4 to 10 if the activity is directly related to agriculture	Permanent Based on the revised findings of the 1956 censuses, population censuses and field inventories	2-3: Self-enumeration; distribution and collection of questionnaires by enumerators 511: by post as well

## Annex I (concluded)

Country	Censuses or inquiries A: Executed or B: Planned	Reference year	Scope	Coverage or classification criterion	Statistical unit	Questionnaires	Directory of statistical units	Method of enumeration
Panama	A	1961 (2)	14, 2-3, 511	Unlimited coverage	Establishment	2-3: Different questionnaires for establishments of up to 4 persons and those of 5 or more persons. 14 and 511: one for each sector	Permanent Based on new, renewed and expired licenses entered in the records; and field checks	2-3: Distribution, completion and collection of questionnaires by enumerators; distribution and collection of questionnaires by enumerators; self-enumeration; distribution and collection of questionnaires by enumerators
Paraguay	A	1965	2-3, 511	Unlimited coverage	Establishment	One for each sector	Non-permanent Based on the following groups: 193; income tax returns; municipal records; the population census and direct inquiries	(1) Distribution, completion and collection of questionnaires by enumerators for establishments of less than 10 persons. (2) Self-enumeration; questionnaires sent by post in the case of establishments of 10 or more persons
Peru	A	1963	1, 2-3, 511	Unlimited coverage	Establishment (1)	2-3: Different questionnaires for establishments of up to 4 persons and those of five or more persons. 1 and 511: one for each sector	Non-permanent Pre-census register	1 and 2-3: for establishments of more than 5 persons, and self-enumeration; distribution and collection of questionnaires by enumerators 2-3: For establishments of less than 5 persons, distribution, completion and collection of questionnaires by enumerators
Dominican Republic	B	1965	1, 2-3				Permanent	Self-enumeration; distribution and collection of questionnaires by enumerators
Trinidad and Tobago	A	1963	2-3	Unlimited coverage	Establishment	One only	Non-permanent Based on records of firms employing 10 or more persons; telephone directories and field checks	Self-enumeration; distribution of questionnaires by enumerators in rural areas (2) by post in urban areas
Uruguay	B	1965	1, 2-3		Establishment		Non-permanent Based on information obtained from records of establishments during field visits by enumerators	Distribution of questionnaires by enumerators and collection in offices
Venezuela	A	1963	1, 2-3, 511	Unlimited coverage	Establishment	One for each sector	Non-permanent Based on field inventories	(1) For non-accounting establishments: distribution, completion and collection of questionnaires by enumerators. (2) For accounting establishments: self-enumeration with distribution and collection of questionnaires by enumerators

Notes: (1) 511: Enterprises.  
(2) 511: 1962.

Annex II

INDUSTRIAL CENSUSES: APPROXIMATE DURATION OF SOME OF THE PROCESSING  
STAGES AND DATES OF PUBLICATION OF RESULTS

Country	Reference year	Enumeration	Editing, coding and tabulation	Dates of publication of results	
				Provisional	Definitive
Argentina	1963	4 days <u>a/</u>	2 years	...	...
Brazil	1959	19 months <u>b/</u>	3 years <u>b/</u>	September 1963	...
Costa Rica	1962/63	7 months	13 months	...	...
Ecuador <u>c/</u>	1964 <u>d/</u>	1 month	5 months	...	...
El Salvador	1961	6 months	13 months	December 1963	...
Guatemala <u>c/</u>	1964/65	1 month	6 months	...	...
Jamaica	1960	9 months	7 months	...	February 1963
Mexico	1960	45 days	13 months	January 1963	June 1965
Panama	1961	4 months	17 months	August 1964	...
Paraguay	1963	15 months <u>e/</u>	8 months	October 1965	...
Peru	1963	2 months	10 months	July 1965	...
Trinidad and Tobago	1963	...	...	...	...
Uruguay <u>c/</u>	1965	1 month	12 months	...	...
Venezuela	1963	4 months	12 months	...	...

Notes: a/ This figure probably refers to the period in which the respondents should collect the questionnaires for filling in.

b/ Including a year in which the work was at a standstill.

c/ Census planned.

d/ According to the latest information available, the reference year is 1965.

e/ Three months for the enumeration itself and one year for re-enumeration.

Annex III  
MINING: ITEMS OF DATA REQUESTED

Items of data	Inter- American Programs	Country			
		Argentina	Brazil	Peru	Venezuela
<b>A. PERSONNEL ENGAGED</b>					
Working proprietors and active partners	x	x 1/	x	x	x
Members of the proprietor's family	x	x 1/		x	x
<u>Employees</u>					
Total	x				
Directors, managerial and executive staff		x 1/		x	x 2/
Professional staff		x 1/	x	x	
Technical staff		x 1/		x	
Administrative staff		x 1/	x	x	x
Salesmen in general				x	
(a) Sex indicated		x			x
<u>Workers</u>					
Total	x				
Supervisors, foremen, etc.		x 1/	x	x	
Miners		x 1/			
Machine operatives		x 1/			
Hands		x 1/			
Night watchmen, drivers and workshop hands		x 1/			
Operatives and apprentices			x 1/		
Skilled or specialized				x	x
Semi-skilled				x	
Unskilled				x	x
(a) Sex indicated		x	x		x
Man-hours worked	x	x	x	x	x
<b>B. WAGES AND SALARIES</b>					
Working proprietors and active partners drawing a fixed monthly sum		x			
Members of the proprietor's family		x			
<u>Employees</u>					
Total administrative and technical staff	x				
Directors, managerial and executive staff		x		x	x 2/
Professional staff		x	x	x	
Technical staff		x		x	
Administrative staff		x	x	x	x
Salesmen in general				x	
(a) Sex indicated					x
<u>Workers</u>					
Total	x				
Supervisors, foremen, etc.		x		x	
Miners		x			
Machine operatives		x			
Hands		x			
Night watchmen, drivers and workshop hands		x			
Operatives and apprentices			x		
Skilled or specialized				x	x
Semi-skilled				x	
Unskilled				x	x
Homeworkers			x		
(a) Sex indicated					x
<b>C. INSTALLED CAPACITY AND ELECTRIC ENERGY CONSUMPTION</b>					
<u>Prime movers (total horsepower)</u>					
Steam-driven machines and turbines	x	x	x	x	x
Internal combustion engines	x	x	x	x	x
Water wheels and turbines	x	x	x	x	x
Reciprocating steam engines		x			
Gas turbines		x			
(a) Distinguishing those not driving electric generators from others				x	x
(b) Distinguishing between those in use and in reserve			x		

## Annex III (concluded)

Items of data	Inter-American Programme	Country			
		Argentina	Brazil	Peru	Venezuela
<b>G. (cont.)</b>					
<u>Electric motors</u>	x	x	x	x	x
(a) Distinguishing between LC and DC		x			
(b) Distinguishing between those driven by self-generated and by purchased electricity			x	x	x
(c) Distinguishing between those in use and in reserve			x		
<u>Electric generators</u>	x	x	x	x	x
(a) Distinguishing between LC and DC		x	x		
(b) Distinguishing between actual and nominal capacity					x
(c) Distinguishing between those in use and in reserve			x		
<u>Electricity purchased</u>	x	x	x	x	x
<u>Electricity generated</u>	x	x	x	x	x
<u>Electricity sold</u>	x	x	x	x	x
<u>Electricity consumed</u>			x		x
<b>D. STOCKS, AND PURCHASE AND SALE OF FIXED ASSETS</b>					
<u>Stocks (at beginning and end of year)</u>					
Value and quantity of raw materials, supplies, fuels, etc.	x		x	x	x 3/
Value of work in process	x			x	x
Value of finished products	x		x	x	x
<u>Fixed assets</u>					
<u>New: Machinery and equipment (including transport)</u>	x	x	x	x	x
Buildings and other construction (including sites and installations)	x	x	x	x	x
<u>Own-account constructions:</u>					
Machinery and equipment (including transport)	x	x	x	x	x
Buildings and other construction (including installations)	x	x	x	x	x
<u>Used: Machinery and equipment (including transport)</u>	x	x	x	x	x
Buildings and other construction (including sites and installations)	x	x	x	x	x
<u>Sold: Machinery and equipment (including transport)</u>	x	x	x	x	x
Buildings and other construction (including sites and installations)	x	x	x	x	x
Value of depreciation					x
<b>E. GOODS CONSUMED (OR RECEIVED) AND PAYMENT FOR SERVICES OBTAINED</b>					
Cost of the raw materials and supplies consumed or received	x	x	x	x	x
(a) Distinguishing between domestic and imported		x		x	
Cost of fuels consumed	x	x	x	x	x
Cost of goods sold in the same condition as purchased (purchasing price)	x	x	x	x	x
Cost of prospecting activities, preparation of the site and drilling	x				x
Cost of industrial work done		x		x	
<b>F. GOODS PRODUCED (OR SHIPPED) AND PAYMENT RECEIVED FOR SERVICES RENDERED TO OTHERS</b>					
Quantity and value of minerals produced (or shipped)	x	x	x	x	x
(a) Distinguishing between minerals extracted and concentrates		x		x	
Value of sales by destination			x	x	
Value of work done or services rendered	x		x	x	x
Value of goods in the same condition as purchased	x				x

Notes: 1. Distinguishing between persons of under and over 18 years of age.

2. Employees and managerial and technical staff.

3. Value only.

## Annex IV

## MANUFACTURING: ITEMS OF DATA REQUESTED AND PUBLISHED

Items of data	Inter-American Programme	Country											
		Argentina	Brazil	Costa Rica	El Salvador	Guatemala	Jamaica	Mexico	Panama	Paraguay	Peru	Trinidad and Tobago	Venezuela
<b>A. PERSONNEL ENGAGED</b>													
<u>Total</u>					( )			( )	( ) <sup>2/</sup>	( )	( )		
Working proprietors and active partners	x	x 1/	x	x	x	x	(x)	(x)	x	x	x	x	x
Members of the proprietor's family	x	x 1/		x	x	x	(x)	(x)	x	x	x	x	x
(a) Sex indicated		x		x	x	x	(x)	(x)	x	x	x	x	x
<u>Employees</u>													
<u>Total</u>	x				x		(x 5/)	(x)	x	x			
Directors, managerial and executive staff		x 1/		x		x					x	x 2/	x 2/
Professional staff		x 1/	x								x		
Technical staff		x 1/		x 4/		x 4/					x		
Administrative staff		x 2/	x	x		x					x	x 3/	x
Salesmen in general											x		
(a) Sex indicated		x		x	x	x	(x)	(x)	x			x	x
<u>Workers</u>													
<u>Total</u>	x		( ) <sup>8/</sup>		x			( )		(x)	( )	x	
Supervisors, foremen, etc.		x 1/	x					(x 6/)			x		
Shop stewards and assistant shop stewards		x 1/											
Hands		x 1/											
Apprentices and assistants		x 1/	x 1/	x					x				
Night watchmen, drivers and workshop hands		x 1/											
Skilled or specialized								(x)	x		x		x
Semi-skilled											x		
Unskilled							(x 3/)	(x)	x		x		x
Production technicians				x		x							
Home workers or sub-contractors							x						
(a) Sex indicated		x	x	x	x	x	x	(x)	x			x	x
Man-hours worked	x	x	x	x	x	x	x	x	(x)	x	x	x	x
<b>B. WAGES AND SALARIES</b>													
<u>Total</u>								( )	( )	( )	( )	x	
Working proprietors and active partners		x											
Members of the proprietor's family		x											
<u>Employees</u>													
<u>Total</u>	x				x		(x 5/)	(x)	x	x			x 2/
Directors, managerial and executive staff		x		x		x					x		x 2/
Professional staff		x	x								x		
Technical staff		x		x 4/		x					x		
Administrative staff		x	x	x		x					x		x
Salesmen in general											x		
(a) Sex indicated					x	x	(x)		x				x

Items of data	Inter-American Programme	Country											
		Argentina	Brazil	Costa Rica	El Salvador	Guatemala	Jamaica	Mexico	Panama	Paraguay	Peru	Trinidad and Tobago	Venezuela
<u>Workers</u>													
Total	x		( )		x			(x)	x	(x)	( )		
Supervisors, foremen, etc.		x					(x 6/)				x		
Shop stewards and assistant shop stewards		x											
Hands		x			x								
Apprentices and assistants		x	x	x									
Night watchmen, drivers and workshop hands		x											
Skilled or specialized						x					x		x
Semi-skilled											x		
Unskilled						x	(x 6/)				x		x
Production technicians				x		x							
Homeworkers			x				x						
<b>C. INSTALLED CAPACITY AND ELECTRIC ENERGY CONSUMPTION</b>													
<u>Total plant (horsepower)</u>			( )								( )		
<u>Prime movers</u>	x	x	x	x	x	x		(x)	x	x	x	x	x
Steam-driven machines and turbines	x	x	x	x	x	x		(x)	x	x	x		x
Internal combustion engines	x	x	x	x	x	x		(x)	x	x	x		x
Water wheels and turbines	x	x	x	x	x	x		(x)	x	x	x		x
Reciprocating steam engines		x											
Gas turbines		x											
(a) Distinguishing between those not driving electric generators from others		x			x	x		(x)		x	x	x	x
(b) Distinguishing between those in use and in reserve			x		x						x		x
<u>Electric motors</u>	x	x	x	x	x	x		(x)	x	x	x	x	x
(a) Distinguishing between LC and DC		x			x			(x)					
(b) Distinguishing between actual and nominal capacity			x						x		x		x
(a) Distinguishing between those in use and in reserve			x										
<u>Electric generators</u>	x	x	x	x		x		(x)	x	x	x		x
(a) Distinguishing between LC and DC		x	x	x				(x)					
(b) Distinguishing between actual and nominal capacity													x
(c) Distinguishing between those in use and in reserve			x										
<u>Electricity consumed</u>													
Electricity bought (kWh and value)	x	x	x	x	(x)2/	x	x	(x)	x	x	x	x	x
Electricity generated (kWh)	x	x	x	x	x	x	x	(x)	x	x	x	x	x
Electricity sold (kWh and value)	x	x	x	x	x	x		(x)	x	x	x	x	x



Items of data	Inter-American Programme	Country										
		Argentina	Brazil	Costa Rica	El Salvador	Guatemala	Jamaica	Mexico	Panama	Paraguay	Peru	Trinidad and Tobago
<b>D. STOCKS, AND PURCHASES AND SALES OF FIXED ASSETS</b>												
<u>Stocks</u>												
Value and quantity of raw materials, supplies, fuels, etc. (at beginning and end of year)	x	x	x	x	x	(x) 2/	(x)	x	x	x	x	x
Value of work in process	x		x	x	x	(x)	(x)	x	x	x		x
Value of finished products	x	x	x	x	x	(x)	(x)	x	x	x		x
Changes in inventories				(x)				(x)				
<u>Fixed assets</u>												
New: Machinery and equipment (including transport)	x	x	x	x	x	(x)	(x)	x	x	x		x
Buildings and other construction (including sites and installations)	x	x	x	x	x	(x)	(x)	x	x	x	x	x
<u>Own-account construction:</u>												
Machinery and equipment (including transport)	x	x	x	x	x	( )	(x)	x		x		x
Buildings and other construction (including installation)	x	x	x	x	x	( )	(x)	x		x		x
<u>Used:</u>												
Machinery and equipment (including transport)	x	x	x	x	x	(x)	(x)	x	x	x		x
Buildings and other construction (including sites and installations)	x	x	x	x	x	(x)	(x)	x	x	x		x
<u>Sold:</u>												
Machinery and equipment (including transport)	x	x	x	x	x		(x)	x		x		x
Buildings and other construction (including sites and installations)	x	x	x	x	x		(x)	x		x		x
Value of depreciation				x	x	(x)						x
<b>E. GOODS CONSUMED (OR RECEIVED) AND PAYMENT FOR SERVICES OBTAINED</b>												
<u>Total inputs</u>												
Quantity and cost of raw materials and supplies consumed or received	x	x	x	x	(x)	x	(x) 2/	(x) 2/	(x) 2/	(x)	(x)	x
(a) Distinguishing between domestic and imported		x	x		x	x	x	(x) 2/	x	x		x
Quantity and cost of fuels consumed	x	x	x	x	(x)	x	(x) 2/	(x) 2/	x	x		x
Cost of industrial work done	x	x	x	x	(x)			(x)	x	x		x
Cost of goods sold in the same condition as purchased (purchasing price)	x			x					x	x		x
Payment of homeworkers		x						(x)				
Cost of repair and maintenance work							(x)					
<b>F. GOODS PRODUCED (OR SHIPPED) AND PAYMENT RECEIVED FOR SERVICES RENDERED TO OTHERS</b>												
<u>Total</u>												
Quantity and value of goods produced (or shipped)	x	x	(x)	x	(x)	x	x	(x)	(x) 2/	(x) 2/	x	x
Value of work done or services rendered	x	x	x	x	x	x		(x)	x	x		x
Value of goods sold in the same condition as purchased	x	x	x	x	x	x			x	x		x
Value of repair and maintenance work		x			(x)	x				x		x

Notes: 1/ Distinguishing between persons of under and over 18 years of age. 2/ Employees and managerial and technical staff. 3/ Including services. 4/ Technicians at the professional level. 5/ Comprising all supervisory staff, employees and wage-earners. 6/ Foremen, technicians and apprentices. 7/ Value only. 8/ Yearly average. 9/ Average number of employees.

x = data requested. ( ) data published.

Annex V  
ELECTRICITY: ITEMS OF DATA REQUESTED

Items of data	Inter-American Programme	Countries							
		Argentina	Brazil	El Salvador	Mexico	Panama	Paraguay	Peru	Venezuela
<b>A. PERSONNEL ENGAGED</b>									
Working proprietors and active partners	x	x 1/	x	x	x	x	x	x	x
Members of the proprietor's family		x 1/		x	x	x	x	x	x
(a) Sex indicated		x		x	x	x			x
<u>Employees</u>									
Total	x			x	x	x	x		
Directors, managerial and executive staff		x 1/	x					x	x 2/
Professional staff		x 1/						x	
Technical staff		x 1/	x					x	
Administrative staff		x 1/	x					x	
Salesmen in general								x	
(a) Sex indicated		x		x	x	x			x
<u>Workers</u>									
Total	x			x			x		
Supervisors, foremen, etc.		x 1/	x					x	
Shop stewards and assistant shop stewards		x 1/							
Hands		x 1/							
Apprentices and assistants		x 1/	x 1/			x			
Night watchmen, drivers, workshop hands, etc.		x 1/							
Skilled workers					x	x		x	x
Semi-skilled					x	x		x	x
Unskilled					x	x		x	x
(a) Sex indicated		x	x	x	x	x			x
<u>Men-hours worked</u>									
		x		x	x	x			x
<b>B. WAGES AND SALARIES</b>									
Working proprietors and active partners		x							
Members of the proprietor's family		x							
<u>Employees</u>									
Total administrative and technical staff	x			x	x	x	x		
Directors, managerial and executive staff		x						x	x 2/
Professional staff		x	x					x	
Technical staff		x						x	x
Administrative staff		x	x					x	x
Salesmen in general								x	
(a) Sex indicated				x		x			x
<u>Workers</u>									
Total operatives and other manual workers	x			x	x	x	x		
Supervisors, foremen, etc.		x						x	
Shop stewards and assistants		x							
snop stewards		x							
Hands		x							
Apprentices and assistants		x	x						
Night watchmen, drivers and workshop hands		x							
Skilled or specialized								x	x
Semi-skilled								x	
Unskilled								x	x
(a) Sex indicated				x		x			x

## Annex V (continued 1)

Items of data	Inter-American Programme	Countries							
		Argentina	Brazil	El Salvador	Mexico	Panama	Paraguay	Peru	Venezuela
<b>C. INSTALLED CAPACITY FOR ELECTRICITY PRODUCTION, TRANSMISSION AND DISTRIBUTION</b>									
<u>Equipment for production of mechanical and electric energy</u>									
<u>Prime movers driving generators</u> (number and horsepower)	x	x	x	x	x	x	x	x	x
Steam-driven machines and turbines	x	x	x	x	x	x	x	x	x
Internal combustion engines	x	x	x	x	x	x	x	x	x
Water wheels and turbines	x	x	x	x	x	x	x	x	x
<u>Electric generators</u> (number and horsepower)	x	x	x		x	x	x	x	
<u>Electric motors</u> (number and horsepower)	x	x				x			
<u>High-voltage transmission equipment</u>									
<u>Transformers</u> (number and capacity)	x	x	x	x	x	x	x	x	x
<u>Transmission lines</u> (length)	x	x	x	x	x	x	x	x	x
<u>Distribution equipment</u>									
<u>Stations and sub-stations</u> (number)	x		x	x	x	x	x	x	x
<u>Transformers</u> (number and capacity)	x		x	x	x	x	x	x	x
<u>Extension of distribution networks</u> (length)	x		x	x	x	x	x	x	x
<b>D. STOCKS AND PURCHASES AND SALES OF FIXED ASSETS</b>									
<u>Stocks</u> (at beginning and end of year) Total	x								
Electrical equipment and apparatus				x	x	x	x	x	x
Fuels and lubricants				x		x	x	x	x
<u>Fixed assets</u>									
<u>New: Machinery and equipment</u> (including transport)	x	x	x	x	x	x	x	x	x
Buildings and other construction (including sites and installations)	x	x	x	x	x	x	x	x	x
<u>Own-account construction:</u>									
Machinery and equipment (including transport)	x	x	x	x	x	x		x	
Buildings and other constructions (including installations)	x	x	x	x	x	x		x	

## Annex V (continued 2)

Items of data	Inter-American Programme	Countries							
		Argentina	Brazil	El Salvador	Mexico	Panama	Paraguay	Peru	Venezuela
Used: Machinery and equipment (including transport)	x	x	x	x	x	x	x	x	x
Buildings and other construction (including sites and installations)	x	x	x	x	x	x	x	x	x
Sold: Machinery and equipment (including transport)	x	x	x	x	x	x		x	x
Buildings and other construction (including sites and installations)	x	x	x	x	x	x		x	x
<b>E. PAYMENTS TO OTHER UNITS</b>									
Cost of electricity purchased from other statistical units	x	x	x	x	x	x		x	x
Fuels and lubricants									
(a) Total cost	x	x	x	x	x	x	x	x	x
(b) Cost and quantity of main items	x	x	x	x	x	x	x	x	x
Cost of repair and maintenance work	x	x	x	x	x	x		x	x
Cost of goods sold in the same condition as purchased	x					x			
<b>F. ELECTRICITY PRODUCTION AND DISTRIBUTION, AND TOTAL RECEIPTS</b>									
<u>Electricity production and distribution</u>									
Quantity of electricity generated: hydroelectric	x	x		x	x	x		x	x
Quantity of electricity generated: thermoelectric	x	x		x	x	x		x	x
Quantity of electricity sold or transferred to consumers:									
(a) For public lighting	x	x		x	x	x		x	
(b) For household consumption	x	x		x	x	x	x	x	
(c) For manufacturing and mining	x	x		x	x	x	x	x	
(d) For commercial and other purposes	x	x		x	x	x	x	x	
Quantity of electricity sold or transferred to other enterprises for distribution or resale	x	x		x	x	x		x	x
Quantity of electricity purchased or received from other statistical units	x	x		x	x		x	x	x
Quantity of electricity consumed by the enterprise itself, including losses	x	x		x	x	x		x	

## Annex V (concluded)

Items of data	Inter-American Programme	Countries							
		Argentina	Brazil	El Salvador	Mexico	Panama	Paraguay	Peru	Venezuela
<b>Total receipts</b>									
Total value of sales and transfers of electricity	x	x		x	x	x	x	x	x
1. To final consumers:									
(a) Public lighting	x	x		x		x		x	
(b) Domestic consumption	x	x							
(c) Manufacturing and mining	x	x		x	x	x	x	x	
(d) Commercial and other	x	x		x	x	x	x	x	
2. To resale and other enterprises	x				x	x		x	
Value of receipts under the head of repairs, installations and other services	x			x				x	x
Value of goods sold in the same condition as purchased	x					x			

Notes: 1. Distinguishing between persons of under and over 18 years of age.

2. Employees and managerial and technical staff.

