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SEMINAR ON THE ORGANIZATION AND CONDUCT OF POPULATION AND HOUSING CENSUSES FOR LATIN AMERICA

Organized by the United Nations Economic Commission for Latin America, Statistical Office and Office of Technical Co-operation with the collaboration of the Inter-American Statistical Institute, the Latin American Demographic Centre and the United States Bureau of the Census

Santiago, Chile, 20-31 May 1968

REPORT

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I. INTRODUCTION

1. The idea of co-ordinating population and housing censuses on an international basis dates from the last century, but it is only in the last few years that progress has been made in this direction. The first Programme for the Census of America (COTA), organized by the Inter-American Statistical Institute (IASI), was carried out in 1950, and the following one in 1960. Under both programmes, population and housing censuses were conducted in virtually the whole of the Americas.

2. In its resolution 1054 B (XXXIX) of 16 July 1965, the United Nations Economic and Social Council requested the Secretary-General to proceed with the development of 1970 world population and housing census programmes. It recommended that the Member States of the United Nations undertake to carry out population and housing censuses during the period 1965-1974 and that they take into account the international recommendations in order that the censuses may meet national requirements and facilitate the study of population and housing problems on a world-wide basis. The Organization of American States, for its part, has expressed, in a number of meetings and resolutions, its continuing interest in the Programme for the Census of America, as part of its efforts to intensify inter-American co-operation for the improvement of national statistical services.1/

1/ See resolution 50/54 adopted at the Meeting of Ministers of Finance or Economy (Fourth Extraordinary Meeting of the Inter-American Economic and Social Council, Rio de Janeiro, Brazil, December 1954) in Annals of the Organization of American States, volume VI, N° 4 (Washington, Pan American Union, 1954), and the decisions taken by the Council of the Organization of American States at its special session on 8 July 1959 (document C.sa-331). See also the annual report of the fourth annual meeting of the Inter-American Economic and Social Council, held at Buenos Aires from 15 March to 1 April 1966 (document OEA/SER.H/XII.II), and the final report of the Fifth Inter-American Statistical Conference, held at Caracas in October 1967 under the auspices of the Organization of American States (document 5517b).

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3. The Programme for the 1970 Census of America is now being carried out. Handbooks containing methodological principles and international recommendations are being prepared for the purpose, the previous handbooks having been updated on the basis of fresh experience and the views expressed by specialized bodies and national authorities. The Seminar on the Organization and Conduct of Population and Housing Censuses for Latin America, which took place at Santiago, Chile, from 20 to 31 May 1968, was organized by the United Nations as part of the preparatory work for the 1970 censuses. The purpose of the Seminar was to discuss census methods and to enable the government officials responsible for conducting population and housing censuses in their own countries to exchange ideas on the subject.

/II. ORGANIZATION

II. ORGANIZATION AND PARTICIPANTS

4. The Seminar was organized by the United Nations Economic Commission for Latin America, Statistical Office and Office of Technical Co-operation, in accordance with the regional programme of technical co-operation, and in co-operation with the Inter-American Statistical Institute, the Latin American Demographic Centre and the United States Bureau of the Census.

5. It was attended by forty-one participants and observers from the following countries: Argentina, Barbados, Brazil, British Honduras (Belize), Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, the Netherlands, Panama, Peru, Trinidad and Tobago, United States, Uruguay and Venezuela.

6. The following agencies sent representatives: the Latin American Institute for Economic and Social Planning, the International Labour Organisation, the World Health Organization/Pan American Sanitary Bureau, the Food and Agriculture Organization of the United Nations and the Inter-American Statistical Training Centre.[2/]

7. The following officers were elected: Chairman: Mr. Sergio Chaparro (Chile); First Vice-Chairman: Mr. Rubén Gleason (Mexico); Second Vice-Chairman: Mr. Dexter Rose (Jamaica); Rapporteur: Mr. René Arturo Orellana (Guatemala).

8. The discussions were based on the following agenda:[3/]

1. Planning of population and housing censuses;
2. Co-ordination between housing censuses and population censuses and of these censuses with other statistical inquiries and compilations;
3. Geographic work for census purposes and preparation and use of census control lists;
4. Selection of census topics and preparation of a census tabulation programme;
5. Preparation of census questionnaire and of instructions for enumeration;

2/ The list of participants is given in annex I.

3/ The list of background documents is given in annex II.

6. The enumeration;
7. Checking, coding and editing of census questionnaires;
8. Electronic processing of census data;
9. Design and execution of a census publication programme;
10. Methods of evaluating the reliability of population and housing census data;
11. Use of sampling in population and housing censuses;
12. Census tests and the experience of American countries in carrying out pilot censuses and surveys in connexion with 1970 censuses.

III. SUMMARY OF DISCUSSION

Planning of population and housing censuses

9. For the discussion of this item the Seminar had before it the document entitled "Planning of a population and housing census" (ST/ECLA/Conf.32/L.1). In the introduction to this document, a population and a housing census was defined and the essential features of both types of census were outlined. The main points of the census planning were then dealt with, and then the problems and principles of the census organization and administration.

10. Under the head of census planning, the necessity of integrated census planning was discussed and the advantages of making such planning a continuous activity of the statistical agency were pointed out. Emphasis was laid on the necessity of starting planning operations early, especially when modern techniques are used, because this phase of the census work now takes longer than it used to do. The elements of a census plan were then presented, first according to their content and timing and, secondly, according to their nature. Lastly, the main considerations in the preparation of a census calendar were considered and a draft census calendar was presented as an example in annex I of the paper.

11. Among the different problems of census organization and administration, the legal basis of the census was first dealt with. The necessity of a general census law and the main subjects it should cover, and also the content of the subsidiary legislation were explained. Budget preparation and cost control were then discussed. Detailed information was given on the principles of census organization, at its three different levels: central census office,

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the field organization, and the census commissions. The importance of a permanent census office was explained and a scheme was presented for its internal organization. Lastly, the questions of staff recruitment and training were discussed.

Country census plans

12. The participants reported on the situation in their countries regarding plans for the next censuses. Of the twenty three countries represented at this meeting nineteen have taken final or provisional decisions on the date of their next census. Three other countries may conduct population censuses around 1970, but because of financial problems they have not yet decided on the exact date. Only one participant reported that there was practically no possibility of organizing a census during that period. A summary of the information supplied by the participants and of similar information from countries not participating in the Seminar is presented in annex III.

Census planning

13. There was a discussion of the problem that the final decision on census taking is not in the hands of the statistical authorities, i.e., of those persons who are responsible for the technical preparation and execution of a census; government authorities have to be convinced of the necessity of census taking. The main arguments which can help the individual countries' statistical agencies in this very difficult task were given as follows: (a) the census is the basis for social and economic development planning; (b) the census gives the analytical basis for many kinds of research; (c) a modern census is not only a source of simple statistics but also the frame for many continuous statistical investigations, partly based on sampling.

14. Because of its scope, a population and housing census is one of the most comprehensive statistical activities and therefore requires substantial appropriations of funds and considerable staff. The effort made in that direction is fully justified, however, by the important results obtained. To eradicate the illiteracy, disease, poverty and inequality found in the world today, it is necessary first and foremost to know how many we are, what we are like, how we are distributed geographically, and how we live. Every development and population policy requires that knowledge as a minimum. Both the scientific and the technical research into the economic, social and cultural complex and the policies that are framed to solve the burning problems of that kind which under-development involves are based, or should be based, or at least minimum knowledge about population.

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15. While it was recognized that a general census law which fixes the periodicity of census taking facilitates the government's acceptance and is a help in obtaining the necessary financing, some participants said that, in their experience, the census law - though a necessary condition - was not enough to secure the necessary resources for the census. It was recognized that it is necessary to convince the government authorities of the necessity of census taking at the time that preparation must be started.

16. The Seminar recognized that the census is basically a national operation and that, therefore, the national statistical agencies have to convince their own national authorities of the necessity of census taking and of obtaining the necessary financing. The role of international assistance in this phase was also discussed. Some participants expressed the view that the international recommendations and their acceptance by countries (in the United Nations Economic and Social Council and at the Inter-American Statistical Conference, and indirectly also through the Alliance of Progress) oblige governments to organize and conduct a census around 1970.

17. The Seminar expressed the view that the main help which international organizations could give to individual countries consists in specialized technical assistance especially in the form of experts in sampling and electronic data processing and of the organization of training courses for national census personnel.

18. The Seminar agreed that the careful planning of censuses is of crucial importance to the successful conduct of the operation and that, therefore, census planning must be a continuing activity of the national statistical agency, which implies the existence of a permanent census office.

19. The Seminar was of the opinion that a relatively long period is needed for the preparation of a census, which comprises many closely interrelated steps and must be planned well in advance if a proper and uninterrupted sequence of operations is to be maintained. It was also agreed that planning for a census could be limited to the preparation of a questionnaire and the determination of the census topics but must also include all the steps up to the compilation, evaluation, analysis and publication of the census results. The detailed planning of a modern census takes at least two or three years, and longer preparation is needed for modern census techniques, especially electronic data processing, than for the older methods. It is

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necessary, therefore, to extend the preparatory period for the census. On the other hand, a shorter post-enumeration period than before can be expected. Some participants informed the Seminar that the operations of their last census had been delayed because the census had not been planned carefully enough; no allowance had been made for the problems connected with the use of the new data processing techniques for instance.

20. It was felt also that the content of a census plan cannot be taken over from the previous census. Modern censuses have to satisfy more needs than formerly and modern census techniques can and should be applied.

Census calendar and critical path method

21. The draft census calendar which is presented as annex I of the discussion paper, and whose main features are set out in annex IV of the present report, was found acceptable. This calendar divides the census work into four main phases: (a) preparatory work; (b) pre-enumeration work; (c) enumeration work; (d) post-enumeration work.

22. Many of the participants expressed their interest in a new method used for census planning, i.e., the critical path method (CPM), and asked the secretariat to give technical help in that respect, for example, by preparing a manual on the application of this method in connexion with the planning of population and housing censuses. The critical path method is comparable to a flow chart which breaks each operation down into activities or tasks, relates each component to the next step in the operation, and establishes the minimum amount of time needed to finish each step and the latest date by which it must be completed in order not to interfere with any other part of the operation. The critical path method may be used to test whether each of the operations included in the census plan has in fact been completed in the time allowed for it. This method goes further than the calendar in that it takes account of the operational relationships among the tasks included in the plan. Before a critical path analysis can be carried out, each task must be linked both to the tasks which must be completed before it can begin and to those which cannot begin until it is completed. Since in practice the relationships between various tasks are not always clear, if there is any doubt whatsoever about the extent to which one task depends upon another, those directly responsible for the operations should be consulted.

23. Using as first assumptions the times established in the census calendar and the operational links just referred to, it is possible to set out graphically the network of tasks which make up the census operation and to isolate those tasks which determine the over-all timing. These are the critical tasks, and their sequence throughout the census operation establishes what is called the critical path. Any delay in the tasks along this path will delay the entire census operation unless a compensatory saving of time can be achieved in subsequent tasks along the path.

24. The method also shows the flexibility which exists for the timing of each of the tasks that are not critical, and to what extent they may be delayed without affecting the over-all timing of the census. This flexibility is expressed in terms of the time unit adopted and is referred to as "float". Almost certainly the first analysis will lead to some rethinking and some rescheduling, and further analyses will have to be carried out. Information on the amount of "float" that exists for each task also facilitates a possible transfer of available resources in order to reduce the time for the task which follows in the critical path, and hence the time required for the whole operation.

25. The graphic presentation of the final plan established with the aid of the critical path analysis serves a useful purpose for checking progress as the census operation proceeds. Any departures from the original schedule (either delays or accelerations) which may have occurred can be analysed in relation to their effect on the tasks lying ahead. This makes it possible to speed up certain operations or to reschedule them so as to obtain the most efficient execution of the remainder of the census programme.

26. The use of computers provides a means of testing the effects of a wide range of alternative assumptions with respect to the timing of the various tasks. Computer programmes may be prepared for this purpose or package programmes may be used. The data concerning a specific census programme are combined with a package programme and fed into the computer.

27. Needless to say, however, computers cannot take over the initial task of establishing the relationships between the operations to be performed or that of making the first assumptions concerning the time required for each operation. These are functions which must be fulfilled by the census planner in close collaboration with the census staff directly concerned with the operations. These initial steps in the analysis provide

a convenient means of examining the logic underlying the census plan, and it is suggested that they should be carried out even if computers are not used.

Legal basis

28. Regarding the legal basis of the census, the Seminar agreed on the necessities and advantages of general census (or statistical) legislation, which should cover if possible the obligation to take periodical censuses, the determination of the authority responsible for census taking (in almost all countries, the national statistical office), obligations of the public and the confidentiality of the individual census data. Many participants stressed the importance of this last point and the desirability of obtaining good co-operation from all groups of the population.

29. There was a detailed discussion of the relationships between a general statistical law and special legislation such as government decrees for the census. In this connexion, the view was expressed that special legislation which stipulates the date of the census and authorizes its organization and administration is very necessary. It was felt also that, when this legislation is adopted, the broad provisions of the census financial plan should be available though this does not mean that at this moment the budget itself has already to be worked out in detail, separately for each fiscal period.

Administrative organization

30. Attention was drawn to the necessity of establishing modern cost accounting methods in the census organization and of supervising the execution of the census budget by carrying out a continuous analysis of each operation.

31. The problems of the administrative organization of the census at different levels were discussed in detail. It was generally agreed that a permanent organization should be responsible for the preparation and execution of the census at the national level. This office, which was called the "central census office" in most of the countries, is an integral part of the national statistical office and there is a direct line of authority between the director of the national statistical office and the chief of the central census office. The main advantages of such a permanent census office that were mentioned were as follows: availability of a trained and experienced staff, maintenance of records, continuity of the census

work between censuses, the possibility of better census preparation, and the availability of a nucleus of processing equipment and office space.

32. During the discussion, the two different forms of census field organization were mentioned. National experience showed that, in most of the countries, it is best for the census field organization to come directly under the central office instead of under the local authorities, though the need for the participation of the local administrative authorities in the census work was recognized.

33. In most of the countries, a census commission was established during the census preparatory period, with several sub-commissions which worked on different subjects relating to the census operation. On the whole, it was felt that these commissions have a co-ordinating and advisory task and that the executive responsibility must always be in the hands of the census office.

34. The difficulties of staff recruitment for census work were discussed. Census offices need trained and experienced personnel, which is not available in every country in the region and which can be retained by the office only with difficulty. The necessity of organizing training courses at different levels and in different subjects was stressed. Some participants pointed out the need for obtaining international help for the training of technical personnel, especially in the sampling and data processing fields. The Seminar was informed that the United States Bureau of the Census planned to hold a special Latin American census workshop in Spanish, in addition to its general training course which is conducted in English for participants from all over the world.

Co-ordination between housing censuses and population censuses and of these censuses with other statistical inquiries and compilations

35. Discussion of this item was based on the document entitled "Co-ordination between housing censuses and population censuses and of these censuses with other statistical inquiries and compilations" (ST/ECLA/Conf.32/L.2). A document entitled "Co-ordination of Censuses and Inter-censal Inquiries on Population and Housing Census Data in the United States" (ST/ECLA/Conf.32/L.21) was also available, for reference.

36. The former dealt first with the relationships between population and housing censuses and then with the relationship of each of these inquiries

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to other statistical inquiries and compilations. For the population census, the relationships investigated were those with the census of agriculture, the census and register of establishments, demographic and labour force sample surveys, housing sample surveys, multi-purpose sample surveys, population registers, the vital statistics system and the international migration statistics system. For the housing census, the relationships considered were those with the census of buildings, the census of agriculture, the census of establishments, housing sample surveys, demographic sample surveys, multi-purpose sample surveys, housing registers and a system of current housing statistics.

37. Apart from a brief consideration of the need for an integrated system of data collection, discussion at the Seminar was concentrated on the relationships between housing censuses and population censuses and the relationships of these two censuses to censuses of agriculture. The participants recognized the need for co-ordination of all of the statistical activities designed to secure data on the demographic, economic and social characteristics of individuals and households and on their housing, in order to enhance the value of the results for each activity, particularly as they contribute to economic and social development planning. It was agreed that the usefulness of census results and of the data from other inquiries and compilation, can be greatly enhanced if, as part of an integrated system of data collection, the inquiries and compilations are co-ordinated with respect to timing, concepts and definitions.

38. It was pointed out that the close connexions between the censuses of population and housing, on the one hand, and many inter-censal sample surveys, requires consideration of how censuses can most effectively contribute to the design of the sample for a subsequent survey. Provision of a sampling frame is not automatic and, therefore, steps must be taken to ensure that the censuses provide total population and housing figures for the smallest clearly defined areas of a country so that maximum information may be available for the drawing of small samples.

Population censuses and housing censuses

39. An especially close association exists between housing censuses and population censuses, which should never be considered independently of each other because essential elements of each census are common to both. For example, an essential feature of a population census is the identification of

each occupied set of living quarters and of the persons living therein, and an essential feature of a housing census is the collection of information on the characteristics of each set of living quarters in association with the number and characteristics of its occupants.

40. Even though housing censuses and population censuses have traditionally been held concurrently in the countries of the Americas, this practice should not be taken for granted but, as is true of all other census practices, should be reviewed periodically. It was agreed, however, that for the 1970 censuses, it was to the advantage of the countries of the region to take the two censuses simultaneously.

41. If the two censuses are carried out as a combined operation, close co-ordination is essential at all stages, especially during cartographic work, the preparation of control listings, enumeration and data processing. Special attention was drawn to the last two points.

42. For a joint enumeration it is necessary to consider: (a) whether the needs of both censuses can best be served by canvasser enumeration or by householder enumeration, or by a combination of both; (b) the problems of training; and, (c) the timing for the collection of data (data for both censuses to be collected at one time or some housing data to be collected prior to the main enumeration, etc.).

43. For the processing of the results, it will be necessary to establish a system of priorities so that the data most urgently required on population and on housing will be made available as early as possible, with neither subject field unduly subordinated to the other.

Population and housing censuses and agricultural censuses

44. In regard to the relationships between population and housing censuses, on the one hand, and agricultural censuses, on the other, it was pointed out that they do not have so close an association as population censuses and housing censuses because they lack certain essential factors in common. Although both population and agricultural censuses collect information on persons engaged in agriculture, they do not use the same definition for this group of persons. The information for the agricultural census is collected for a particular farm or holding, and classifies as agricultural workers all those who work on it, whether or not they have another occupation. In the population census, on the other hand, the persons considered as agricultural workers are solely those whose principal branch of activity (or occupation) is agriculture.

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45. Another concept that differs in the two censuses is that of "agricultural population" or "farm population". In the agricultural census, this group comprises all the members of the census household of a farm-holder and all other persons living on the agricultural holding. In the population census, the group is composed of all the economically active persons whose principal branch of activity (or occupation) is agriculture, and their dependents.

46. These differences in concepts are to a great extent the result of the fact that the unit of enumeration in the agricultural census is the holding, while the unit of enumeration in the population census is the individual within the household. It is sometimes considered that simultaneous enumeration of the two censuses is advantageous because it may lead to certain economies and provide an occasion for relating some characteristics of the agricultural holdings to characteristics of the population and of households associated with these holdings. The attention of the Seminar was called to the fact that the Statistical Commission of the United Nations has, however, come to the conclusion "that efforts to take the two types of censuses together should not be recommended for linking purposes only, because of the burden this would place on the statistical services involved, the risk of lowering enumerator reliability, the timing problem, the potential delay in processing the large amount of material which would result and the inability of countries to analyse the results of such a large-scale inquiry".4/

47. Some participants stated that their experience strongly supported the conclusions of the Statistical Commission, and that they would not hold the agricultural census simultaneously with the population and housing censuses. Other participants, however, were of the opinion that it was entirely feasible to hold the three censuses concurrently in their countries. Some participants felt that separate enumeration would increase the costs of planning, training and execution because it would require two distinct operational organizations.

4/ Official Records of the Economic and Social Council, Forty-second Session, Supplement N°3, para. 28.

48. In regard to comparative costs of simultaneous and separate enumeration, it was mentioned that, although simultaneous enumeration might be less costly, spaced enumeration permitted the spreading of costs over a longer period. It was also noted that combined training, although less costly, might well be less satisfactory than separate training because the training required for enumerators in the agricultural census was quite different from that required for population and housing census enumerators. Spaced enumeration also permitted better utilization of a smaller staff.

49. In view of the arguments advanced for and against simultaneous enumeration, it was suggested that the final decision in each country would depend on the capacity of the census organization to plan and successfully carry through all three censuses at the same time. Consideration would also have to be given to the enumerators' capacity to collect information on topics in all three fields at one time and to the possibilities of respondent fatigue from having to answer a large number of questions at one time.

Geographic work for census purposes and use of census control lists

50. This topic was discussed in two parts: (a) cartography for census purposes, and (b), the use of census control lists. Discussion was based on documents ST/ECLA/Conf.32/L.4 and L.13 on these respective topics.

(a) Cartography for census purposes

The paper on cartography (ST/ECLA/Conf.32/L.4) dealt mainly with the need for maps for census operations, the functions of a geography office, census map requirements, map acquisition, operational steps in a mapping programme, and map and graphics publication.

51. In addition to the more obvious needs for cartography, such as the delineation of boundaries, it was noted that maps furnish some indications of the speed with which the enumeration can take place and they help provide a framework in which to measure internal migration and the rate of urbanization. Maps gathered during intial phases of the work may also be helpful in providing background information which can then be used in planning and operational activities. They can, for example, indicate the capabilities of the transportation network, show settlement types and location of housing or reveal land use patterns. The organization charge with the responsibility of preparing maps and establishing area controls can also lay out statistical areas and develop maps for publication.

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52. In connexion with the development of maps and determination of boundaries, a wide range of data may often be sought from various kinds of censuses and surveys in order to formulate programmes for specific areas. Such information might be required, for example, in economic development work or in urban planning. Thus, it would be useful if the areas for which data are gathered, regardless of the type of inquiry, were kept the same. This would facilitate the establishment of statistical series covering a wide range of topics for the same area. However, this would require close co-operation among the subject matter divisions planning a census, and there is a problem that physical, socio-economic and political changes in an area may often require that new boundaries be chosen for it. Since boundaries of places in some countries may be subject to variation, it may be desirable to establish a cut-off date after which further changes will not be reflected in the census statistics, or it may be more desirable to attempt to pass a law or issue some type of edict which would prevent boundary changes from taking place after a certain date, except under rather unusual circumstances.

53. Several common mistakes in construction of enumeration maps were stated to be: (1) the map may be made of paper which deteriorates rapidly with use; (2) it may be of a scale which makes it too large to handle easily in the field; (3) the features and names shown may be too small, and they may therefore be hard to read or subject to misinterpretation; (4) if the peripheral zone does not extend out far enough to cover an identifiable point beyond the area being enumerated, the location of the boundary may not be clear; (5) doubtful boundaries, particularly those following imaginary lines, must be field checked (if this is not done, the margin for error is increased); (6) single line roads enhance the chances of inaccurate enumeration; (7) if dwelling units and other buildings are incorrectly located on the map, they tend to confuse the interviewer. As a general precaution, a field team should not normally be sent into an area without at least some rudimentary sort of map from which to start its work.

54. It is difficult to develop an accurate time schedule for mapping operations. Obviously, there will probably be a close relationship between time expanded and the magnitude of the job. It was suggested that a three-year period, on an average, is needed to do the work. In any event all maps

should be available at least three months before the census is to be taken and maps needed for establishing enumeration areas should be available at least six months before the enumeration.

55. The three principal functions of an office of cartography and geography are: (1) the development of maps and determination of boundaries; (2) the establishment of statistical areas; (3) the publication of maps. The geography office must consider, as a mandatory task, the establishment of close working relationships with other mapping agencies in its Government. It should also maintain active contact with private and international organizations which can help supply it with maps and with information which will be of value in taking a census.

56. The discussions of the Seminar centred mainly on the measures required and those being taken to ensure that the 1970 censuses of population and housing would be carried out on an adequate cartographic base. Many participants stressed the fact that adequate mapping was of the utmost importance for census taking and that it would be difficult or impossible to take a census without suitable cartography. In connexion with the availability of maps for census taking in Latin American countries, attention was drawn to a study which had been carried out by the Pan American Union. The results of this study indicated that, in general, statistical maps were greatly inferior to those used for general purposes throughout the region, and it was surmised that many countries had conducted their 1960 censuses without suitable maps. It was noted that, in some cases, countries do not have sufficient resources for adequate cartography and that they need advice and technical assistance. It was also observed that national cartography, even though it may be well advanced, may not be useful for census purposes.

57. Aerial photographs, if current, show physical and cultural features in their correct perspective and may be of great help in base map preparation. However, their use as maps is limited because of the constraints imposed by time and costs. Note was taken of the importance of fully describing the boundaries delineated in maps, whether they refer to enumeration areas, administrative areas or statistical areas, and attention was drawn to the usefulness of dividing cartographic work so that mapping for rural and urban areas would be handled separately. It was suggested that, in rural areas, it might not be so important for each enumerator to be provided with a map and that a simple diagram might serve the purpose.

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58. Special emphasis was placed on the use of maps during the post-enumeration phase of a census, in connexion, for example, with the receipt and control of questionnaires, the editing and collation of census data, the analysis of census data, and the publication of census data according to a spatial distribution.

Map requirements of census offices

59. The central office requires a map of the entire country, showing major population agglomerations, terrain features and drainage and the transportation network. Regional offices require full map coverage, including continuous areas to the region. Maps of intermediate and minor civil divisions, and maps for supervisors, crew leaders and enumerators are also needed. District or local offices require coverage of pertinent administrative areas, plus copies of crew leaders' and enumerators' maps.

60. Some countries prepare census control lists some time before the census enumeration and use them to help determine the size of the enumeration areas. If time allows, it would be advantageous if the enumeration areas could be delineated prior to the listing and finally determined after information is received from local authorities or regional census offices. However, close working arrangements between census and geographic personnel would be required; given the limitations on time involved in map preparation, it may not always be feasible to attempt such an undertaking, desirable as it might be.

Statistical areas

61. A great deal of interest was expressed at the Seminar in the delineation of statistical areas. These areas are defined by criteria established by a national statistical office, on the basis of the needs of the planning agencies. The areas are delineated for data gathering purposes and differ from administrative areas in that the latter are civil divisions of a country which are defined and controlled by an agency of the government, while statistical areas are usually defined in terms of some sort of cultural or economic homogeneity.

62. There are several different types of statistical areas: those having similar social characteristics and market functions, economic areas and sub-regions having similar socio-economic conditions, large urban areas whose boundaries are determined on the basis of urban land use, and small homogeneous portions of cities which are also defined for data gathering purposes.

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63. The advantages of having statistical areas are manifold. For example, it should be possible to obtain a more meaningful series of data if they are gathered for homogeneous areas. Thus, urban planners could make good use of separate tabulations for a central business district or for the squatter settlements (callampas, barriadas, etc.) which are characteristic of many of the larger cities in Latin America. Furthermore, since boundaries do not readily change for statistical areas, comparable data can be provided from census to census. This is important mainly in those countries in which boundary changes of administrative areas are common.

64. Some participants drew attention to the problem that information required to establish statistical areas is frequently not available until the census has been taken. Others demonstrated the way in which data from a previous census had been used for this purpose and also cited indicators and indexes which had been established, on the basis of which statistical areas were defined in their countries. It was emphasized that, in delineating statistical areas, census takers should determine as far as possible the needs of the prospective users. It was suggested that, in developing the work on cartography at the international level, full advantage should be taken of the conclusions of two seminars on cartography which took place in Central America in 1964 and 1966, particularly with respect to the criteria to be used for establishing statistical areas.

65. Although there are obvious advantages in maintaining unchanged statistical areas it was noted that where the need to change them does arise, the boundaries may be adjusted more easily than those of political or administrative areas which are subject to special legislation. However, it was also observed that although statistical areas provide a valuable basis for the interpretation of data and for planning purposes, data will continue to be required for political and administrative areas because of the needs of local bodies such as local governments, school boards, etc.

66. Some participants felt that it would be desirable to develop definitions of areas which would be of significance for the collection and interpretation of census data. These might include metropolitan areas, economic regions, economic sub-regions, urban areas, non-urban areas, etc.

67. It was suggested that, in countries using computers, the use of geographic co-ordinates, in addition to the more traditional descriptions of the location of units of enumeration, might be explored as a means of providing greater flexibility with respect to the areas for which data might be tabulated.

/Map acquisition

Map acquisition

68. Maps can be obtained from a variety of sources: from government agencies, highway agencies, departments of interior or conservation; an agricultural ministry; a geological survey agency; defense agencies. Other sources of information may be planning departments, cadastral survey offices, development banks and area development organizations and health and education agencies. Local governments may furnish maps or they may be obtained from air, rail and trucking firms, construction companies, utilities, engineering organizations, farm co-operatives, libraries, insurance companies and cartographic firms. International agencies and geographic institutes may also have usuable maps.

Map inventory

69. The first step in determining the magnitude of the job of preparing maps for a census is to take a complete inventory. This entails the establishment of a list of all areas for which data are to be reported. The map collection is then examined and compared with this listing in order to determine both quantitative and qualitative coverage. It should be understood that the inventory must be made in close collaboration with the subject division in charge of the census; only such an office can determine the framework in which the enumeration is to take place.

Map and graphics publication

70. One of the required tasks of a geography office in a census organization is to prepare area identification maps for publication. These show the boundaries of areas and the location of places for which data are to appear in print. The publication of data in map and chart form is a fairly inexpensive yet advantageous way to show some of the results of the enumeration. The capabilities of graphic computer outputs should be fully exploited in planning the publication of data according to a geographic distribution in map and chart form.

(b) The preparation and use of census control lists

71. The working paper (ST/ECLA/Conf.32/L.13) prepared for this aspect of the discussion referred to the use of census control lists, their coverage, format, responsibility for preparation and timing and to the content of the lists, methods of preparation and handling of completed lists.

72. During censuses of population and housing, irrespective of whether they are carried out separately or as a combined operation, all places

/which could

which could conceivably be occupied by people must be investigated. Lists of these places, prepared prior to or during the enumeration, serve as a control to ensure that all living quarters in the territory concerned, and/or their occupants, are included in the censuses. Because inadequacies in the control lists thus compiled may adversely affect the entire census operation, the function, content and method of preparation of these lists should be carefully considered in planning a census. Where, as sometimes occurs, the list is to serve as a basis for other inquiries in addition to censuses of population and housing, the consequences of a poorly prepared list are multiplied, and careful preparation is even more vitally important.

73. An examination of country experience indicates that the lists may be used, inter alia, to assist in achieving complete coverage in carrying out censuses of population and housing, as a control or frame for other statistical inquiries, for certain aspects of census planning, for the collection of statistical data, and as a means of providing advance census results. Which of these purposes the list is to serve in any particular census must be decided in the country concerned; however, its function as a factor to ensure complete coverage represents without question a most important aspect of the census operation.

74. The coverage of a control list usually corresponds to that of the census to which it refers. Where the distance to be travelled in sparsely populated areas presents a problem and two visits to each household or to each set of living quarters are not feasible, the preparation of lists prior to the enumeration may be limited to urban or built-up areas. As a means of preventing omissions in sparsely populated areas, a pre-census list is sometimes compiled on the basis of postal records and of the agencies of electricity, water and gas supply or from information obtained from local doctors, missionaries, chiefs, etc. Even a partial list may help to prevent omissions. This preliminary listing may be corrected and completed as the enumeration in these areas proceeds. Although this is a bigger operation than up-dating a more complete list, it is essentially the same procedure.

75. The census control list will often be the first form to be completed during the census operation. In many cases the information entered on this form will serve as the basis for the collection of all information in the census. The personnel responsible for compiling the lists need to be thoroughly trained in the procedures to be followed, and they should be

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provided with clear instructions concerning all aspects of their work. It is especially important that they should be perfectly clear about the units which they are to identify and record.

76. Buildings are normally recorded for purposes of control, and arrangements should be made so that living quarters which are not located in buildings are also included in the lists. If a housing census is being carried out simultaneously with a census of population, living quarters should be individually recorded; it would also be useful to record them even in those cases where only a population census is being taken. The recording of households in addition to living quarters will be necessary since, by definition, more than one household may occupy a single set of living quarters and the recording of at least the number of households in each set of living quarters will be of assistance to the enumerator. The further identification of each household by recording the name of the head provides an even more reliable means of ensuring that households are easily located at the time of, or following, the enumeration. Provision should be made in the listing for recording questionnaires distributed, completed, or collected and for indicating living quarters or households that need to be revisited.

77. Of the twenty-seven countries in the American region for which material was examined, nineteen prepared control lists prior to the enumeration, and nine prepared a list during the enumeration (one country prepared a list both before and after the enumeration). The length of time between the preparation of the listing and the enumeration ranged from a few days to several months.

78. The timing of the control list depends upon the purpose for which the listing is to be used and also upon the estimated time required to prepare it. If the listing is to be used for planning purposes, for example, to estimate the number of enumerators and other personnel required or the quantities of census materials needed, sufficient time should be allowed for the ordering of materials, printing of forms, recruitment and training of personnel.

79. The Seminar confirmed the need for census control lists for planning purposes, for supervising and controlling the work of enumerators and as a convenient means of furnishing advance information on population and housing. A great deal of emphasis was placed on their use in connexion with the selection of sample units during the census of population and housing

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and as a frame for subsequent sample inquiries. Attention was drawn also to their usefulness for the collection of information to serve as a basis for a subsequent census of agriculture.

80. In one country a function of the lists which had not previously been considered is their use in providing a list of names of household heads from which a preliminary selection of candidates who might serve as enumerators could be made. It was noted that, for this purpose, it had been found useful to include in the listing a question on age, as a guide to the suitability and eligibility of those whose names appeared.

81. With respect to the preparation of the lists, attention was drawn to the difficulties of compiling good lists in squatter areas where housing units appear and disappear with some rapidity and where they are not located according to an orderly system of streets and blocks. It was suggested that lists from previous censuses and lists obtained from utility companies, post offices, etc., might serve a useful purpose for the compilation of census control lists.

Selection of census topics and preparation of a census tabulation programme

82. Discussion of this item was based on document ST/ECLA/Conf.32/L.5, "General considerations relating to the selection of topics, tabulation and publication of data in the censuses of population and housing", prepared by the Inter-American Statistical Institute.

83. The Seminar stressed the need to define, as clearly and concretely as possible, both the general and specific objectives of population and housing censuses. In this connexion, it took note of the conclusions of the Meeting on Population Policies in Relation to Development in Latin America,[5/] particularly as regards the definition of "population policy". It was felt that, so far as possible, a population census should provide the data needed as a basis for formulating population policy in each country and for planning and applying measures designed to encourage the optimum use of

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5/ Held at Caracas, 11-16 September 1967, and organized by the Organization of American States and the Aspen Institute for Humanistic Studies, with the co-operation of the Government of Venezuela.

the human potential. Similarly, the basic purpose of a housing census should be to supply the statistical information needed by the countries of the region as a basis for their housing policies.

84. In particular, the participants pointed out that, in order to define the topics to be investigated, consideration should be given, inter alia, to the following points: (a) requirements for national and international data; (b) level of the country's statistical development, organization of the services that would be responsible for planning and taking the censuses, census experience, availability of trained personnel and suitable teams for processing the data gathered; (c) financial resources available to cover the expenditures of all phases of the censuses; (d) cultural level of the respondent and his ability to provide required data; and (e) procedure for the selction of topics.

85. Both national and international requirements for data should be defined well in advance, the latter including the data needs of the country studies reviewed annually by the Inter-American Committee on the Alliance for Progress.

86. It was felt that serious problems of organization and statistical administration and of availability of qualified personnel might make it advisable to reduce the number of topics to be investigated in the censuses, since it was preferable to take a modest census whose results would be available in a reasonable space of time, than to embark on ambitious plans without the proper conditions for carrying them out.

87. It was felt that the use of sampling and quality control in various phases of the population and housing censuses should be given special consideration when the topics to be investigated were determined.

88. In determining the topics, the availability of both material and financial resources should also be taken into consideration. The former included electronic data processing equipment, which was being used more and more frequently and which was essential for obtaining certain types of data that were difficult to obtain by other methods and for making the data available to the user as soon as possible.

89. It was pointed out that some important facts to be taken into account in the choice of topics for a population and housing census included the respondent's cultural level and ability to understand the scope and purpose

of the census as a whole and to furnish the information requested with a reasonable degree of accuracy, and his willingness to submit the information required.

90. In discussing the tabulation programme, the four following questions were considered: (a) the statistical tables that should be obtained as the final product of the investigation; (b) priority (sub-programmes) for the tabulations themselves; (d) time periods for obtaining the results, and (d), data-processing methods.

91. The statistical tables obtained should fulfil the previously defined objectives of the population and housing census. In that respect, it was stressed that the census results should be presented not only by conventional geographic divisions but also by socio-economic divisions so that the information could serve as a basis for regional economic programming.

92. Determination of priorities for the tabulation of the data should be based on weighing the urgency with which the information is needed against the practical possibilities of attending to the requirements without increasing the cost of processing and issuing the data. There was a consensus on the need to determine tabulation sub-programmes, which might include: (a) provisional tabulations obtained through sampling; (b) tabulations of final data; and (c) tabulations for specialized users.

93. In the tabulation of final data, account should be taken of the urgency with which information on the previously determined geographical divisions was required. Determination of priorities might be based on the probable utilization of the results by the national, regional and local institutions responsible for economic planning; priority might also be determined on the basis of the stage of economic development reached by each geographic division or its population.

94. The establishment of time periods for completion of the tabulations depended on the users' requirements, particularly if the studies were on current problems and were based on the data provided by the census. It was agreed that the time periods for completion of the tabulations should be established at the same time as the priorities, with due regard for the available resources and the yield that might be obtained at each data-processing stage.

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95. The mechanisms suggested for the choice of topics and tabulation of the results included the technical statistical committees and, in particular, the working groups which carried out the preparatory studies on which the census authorities based their decisions regarding both the choice of topics and the tabulation of results. It was deemed advisable that those groups, whose work was of a highly specialized nature, should be composed of persons of recognized technical ability and experience in both enumeration and the processing of data. It was also felt that both the working groups and the agency responsible for adopting decisions on census matters should include representatives of the users of this kind of information, particularly national and regional planning bodies. That would not prevent the basic decision on the choice of census topics and the tabulation programme from falling on the office responsible for carrying out the census programme.

96. Lastly, it was agreed that it was impossible for satisfactory headway to be made in the economic and social development of the Latin American countries and in regional economic integration without a comprehensive and well balanced set of reliable, adequate and up-to-date statistics. The carrying out of statistical research and particularly of population and housing censuses, should be based on the expected use of the data requested and its prompt availability. To that end, it would be necessary to take account of the need for data not only on countries, but also, for purposes of international comparison, on sub-regions or groups of countries, continents, and the world as a whole. In order to produce statistics which are calculated to fulfil the users' requirements, the national statistical services must programme their activities. It was stated that the population and housing censuses to be conducted in accordance with the Programme for the 1970 Census of America - which would provide only a small portion of the information needed for development programming - should be considered as part of the integrated programme for the development of statistics rather than as an independent operation.

Preparation of the census questionnaires and instructions for enumeration

97. The discussion of this point of the agenda was based on a document entitled "Preparation of the census questionnaire and instructions for enumeration" (ST/ECLA/Conf.32./L.6).

98. The introduction to this document explains the importance of the questionnaire and of careful preparation of the instructions and the place and timing of both in the census planning. If the census is to be prepared in a logical order, it is obvious that the tabulations programmes must first be defined and the content of the census questionnaire derived from it. Consideration is also given to the different types of questionnaire which can be used, in terms of the number of units for which information is shown on each questionnaire (i.e. single person, single household or single set of living quarters; multiple household or multiple set of living quarters) and of whether the questionnaire is intended for the collection of the basic census data or for subsidiary information. With reference to the style of the questionnaire the line, column, and block form are mentioned; which one is to be used will depend on their relative advantages and disadvantages in each case. Census questions may be framed either affirmatively or interrogatively and there exist three different types: those which require an affirmative or negative reply; those which present a limited number of options; and open questions. The document also deals briefly with the content of the questionnaire. Annex I of the document gives details on the preparation of the different parts of the census questionnaire and annex II a model of the population questions.

99. The document also discusses the general characteristics of the instructions for enumeration. It mentions the different types of census instructions, first by the form in which they are presented (included in the questionnaire or in a separate booklet), then by the type of persons for whom they are intended (respondents, enumerators or supervisors). The paper also refers to the format, content and layout of the manual for enumerators.

100. The discussion mainly dealt with the following three questions of questionnaire preparation: (a) the unit of enumeration; (b) questionnaire style; (c) presentation of the questionnaire.

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101. The Seminar agreed that the best type of questionnaire which can be used for population and housing censuses is that which collects simultaneously data on all the members of a single household or a single set of living quarters. This type of questionnaire presents the following advantages: it is quicker to enumerate, edit and code; it gives clearer information on household and family composition; and it makes it easier to collect the geographical data.

102. Some participants emphasized the advantages of an individual census questionnaire, in which data on only one person are collected separately. There are several advantages to this type of questionnaires: it is small and therefore can easily be handled by the enumerator; a larger amount of information can be shown on it; it adapts extremely well to more advanced processing techniques, such as optical reading devices. A list of the members of the household or set of living quarters or a subsidiary questionnaire can be appended to it to provide a check on the reliability of the individual schedule and to facilitate the coding of household and housing characteristics. The latter operation can also be facilitated if the questions on housing and households are set out on the opposite page of the individual questionnaire of the head of the household and a common code-number is used for identifying all the members of a household or all of the occupants of a set of living quarters.

103. The Seminar discussed in detail the characteristics which determine the best questionnaire style. Most of the participants expressed the opinion that for a modern census it is best to use the column (or vertical) form, where the headings or questions are set out vertically on the left-hand side of the questionnaire, a separate vertical column being used for each person of the household or of the set of living quarters. With this format, a relatively large number of questions can be asked; some questions may be put in a longer interrogative form, which has the advantage that they can be set out exactly as they should be put to the respondent; examples or definitions may be given for all the more complicated questions; and pre-coding is possible for the answers to all questions where a limited number of options exist. The only disadvantage of this form that was mentioned was that it limits the number of persons who can be enumerated on one questionnaire to between 5 and 8.

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104. The participants agreed that the sheet on which the questionnaire is printed should not be too large for convenient handling, but it should be big enough for easy reading and there should be plenty of room for the answers and columns. The necessity of using a good quality of paper was also stressed, together with the importance of agreeable appearance and a suitable type of print.

105. Two participants mentioned that at their next pilot census they want to try out a new format of questionnaire. They plan to prepare a pamphlet or booklet format for each household. In one of these countries, it is planned to include in this booklet a housing questionnaire, a household questionnaire, and as many individual questionnaires as there are members in the particular household. In the other, the pamphlet will include a standard household questionnaire, but this is divided into several parts presented on consecutive pages, each of which contains a limited section of the census questions. A relatively small size is envisaged for both of these formats, which will make them easy to handle, but at the same time will make it possible to include a great many questions. It was suggested that the population questionnaire might be designed in two parts, which could be on the same sheet or on two separate sheets. One part would comprise the questions common to most persons, and the other would include the questions which are put only to specific population groups, such as those relating to economic characteristics, which are obtained only from persons who have reached a specified age. Stress was laid on the advisability of adopting this form of questionnaire, which would mean a considerable saving of space, since some questions apply to only a small proportion of the population.

106. Most of the participants agreed that the household questionnaire makes it possible to enumerate both the personal and housing data at the same time. But it is necessary to decide on the enumeration unit, i.e., whether the questionnaire is to cover all members of a household, or all occupants of a set of living quarters. In both these cases, instructions must be given on the form of enumeration if more than one household occupies the same set of living quarters and, if a living quarters questionnaire is used, the method of separating each household from the others must be established.

107. The Seminar expressed the view that it would be desirable to use roughly similar questionnaires in all countries, in which the questions and the pre-coded answers would be in the same order. Though the model

questionnaire annexed to the document was considered a good example for the purpose, it was recognized that a uniform questionnaire and coding system cannot be agreed upon until the experience of the next census period is available. But at the 1970 censuses some neighbouring countries or some sub-regions might possibly use a more or less uniform system, if the general socio-economic, planning and statistical conditions of the countries are similar. A good example in this respect is given by the Commonwealth countries of the Caribbean, which plan to use the same questionnaire and to process their data jointly at their next census.

108. The Seminar agreed that many different types of census instructions are needed for the different levels of census personnel. It was pointed out that, besides the instructions for respondents, enumerators and supervisors, separate instructions must be prepared for the officials of the census field staff at different levels, such as heads and members of the local census offices. One participant stressed the necessity of preparing a training manual for the enumerators which would serve for the oral pre-census instructions and would differ from the working manual, which is more for practical use and for reference.

The enumeration

109. Discussion of this item was based on the document entitled "The enumeration" (ST/ECLA/Conf.32/L.7), which covered the immediate pre-enumeration operations and the enumeration procedures. The pre-enumeration operations considered were the recruitment and training of field staff and census publicity. Enumeration procedures included: (a) the method of enumeration; (b) the census date and moment; (c) the period of enumeration; (d) the place of enumeration and (e) the enumeration itself.

Recruitment and training of field staff

110. The discussion revealed that most of the countries of the region recruited enumerators and supervisors primarily from the ranks of teachers, civil servants other than those of the statistical and census offices, university students and some students in the higher secondary school grades. In most cases this personnel was not directly paid for its services, although occasionally some supplementary payment was made for difficult assignments, because enumeration work was considered to take the place of the regular work the persons would otherwise have performed. In the countries where enumeration

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was conducted only after the completion of the normal working day, a small fee was paid in recognition of the fact that the staff was actually doing two jobs in one day. Indirect payment sometimes took the form of the granting of a short period of leave from regular duties after the completion of the enumeration, extra credit towards advancement in the teaching system, or extra university credits.

111. In some cases a small number of paid enumerators and supervisors also had to be hired to supplement the unpaid staff. Some countries found it necessary to use members of the police and military forces as enumerators in rural areas that were very difficult of access and where the police were well acquainted with the local population. It was stated that, in spite of the fact that the document under discussion cautioned against the use of the police as enumerators, they had been used very successfully.

112. In contrast to the usual practice, one country had used paid enumerators only. It had found that an experiment in combining teachers, as unpaid enumerators, with a group of paid enumerators hired from other sources, had been quite unsuccesful, and that the teachers had done a poor job. Another country had a constitutional provision under which persons could be drafted to work as unpaid enumerators for the census. As part of the pre-listing of the households for the census, information on age, sex and occupation of each head of household. This information was then used as a basis for selecting persons to act as enumerators for the one-day census.

113. The problem of the quality of the enumerators and other field staff was discussed at some length. It was felt that the major problem posed by the enumerators and supervisors was the difficulty of training, in a short time, the large number of persons required for an enumeration which took no more than a few days and, in some cases, only one day in certain areas. The question was raised as to whether it would not be preferable to spread the enumeration over a longer period of time, so that fewer enumerators would be required and they could be chosen more selectively and trained more intensively. This procedure would raise at least two additional problems, however. In the first place, a more extended enumeration might make it impossible to use civil servants, who could not be spared from their regular jobs for more than a very brief period. Recourse would then have to be made to the use of paid enumerators from other sources. It was feared, however, that in most countries, there was not a sufficient number of qualified

persons who were not regularly employed - and who would, therefore, be available for the census - and that even if such persons were available, it would be very difficult to obtain sufficient funds to pay their salaries. The second problem was that, with a longer period of enumeration, it would not be possible to obtain accurate figures of the composition of the population according to the place where each person was present at the census day, which was the type of distribution traditionally obtained in most of the countries.6/

114. Another point discussed in regard to training was the respective use of centralized and decentralized training. While it was recognized that it would be advantageous to provide centralized training for a special group of trainees who would then go into the field to train all enumerators, supervisors and other field personnel, it was felt that this system was difficult to use in the larger countries, where enumerators, in particular, had to be trained in small local areas. There would, therefore, have to be an added stage during which centrally-trained chief instructors would instruct local personnel, who would then instruct the enumerators.

115. It was agreed, however, that no matter how much centralization was achieved in training, there was a great need for well regulated, uniform training which was not left to the decision of individual instructors. Particular emphasis was given to the need for a training manual in addition to the usual enumerator's handbook. The purpose of the latter was only to serve as a reference guide in the field during the actual enumeration. A much more complete training manual should be used during the training period. It was recognized, however, that reliance could not be placed entirely on the manuals, since many trainees would not read it carefully. Systematic classroom instruction on the basis of the training manual was also required. It was also considered that individual aspects of the instruction might have to be different for urban and for rural enumerators, who face different problems. The participants were interested to hear of a method of programmed learning developed in the United States, which could be used in training enumerators in the region. The essence of this method is that it provides, in written form, both instruction and testing at the same time, so that the trainee knows immediately whether or not he has understood the instruction. Various devices are used so that the trainee can see for himself if he is

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6/ For further discussion of this point see paragraphs 119-122.

giving the correct answers to a series of questions; these devices at the same time impress the correct reply on the trainee's mind and sometimes even prevent him giving erroneous replies.

Publicity

116. The participants expressed their awareness of the importance of adequate census publicity, not only to dissipate any anxiety regarding the purposes of the census but also to explain the reasons for the various questions on the questionnaire and to give some guidance as to the manner in which these questions should be answered. It was suggested that, since public relations and publicity had become an expert field, it should be advantageous for the census offices not to attempt to prepare their own publicity but to use the services of outside experts who specialized in this work.

Enumeration procedures

117. The seminar discussion of enumeration procedures dealt primarily with the method of enumeration, the period of enumeration, and the place of enumeration, as these were related to the difficulties of staff training and the kind of population distribution which would be useful for presentation of the census results.

118. Although there was general agreement on the desirability of reducing the number of enumerators so that they could be more adequately trained, concern was expressed over the effect that this would have on the duration of enumeration. Since a reduction of the number of enumerators would almost inevitably lengthen the period of enumeration, the improvement in the quality of the enumerators would be offset by the probable inability of respondents to give correct information about all the persons present on the date of the census. It was felt that self-enumeration could not be employed on a wide enough scale to reduce the duration of the enumeration. Nevertheless, a number of participants urged consideration of a combination of self-enumeration and the use of canvassers, in whatever manner would be most feasible. This might take the form of complete self-enumeration in some urban areas, or of a combination in these areas of self-enumeration for some questions and the use of enumerators for others.

119. Of greater concern to the participants was the possibility that a longer period of enumeration would necessitate the collection and tabulation of data on the basis of place of usual residence rather than on the basis of the place where each person was present at the time of the census. In this

connexion, the Seminar was informed that the international agencies and the training centres represented at the Seminar generally considered that tabulations based on place of usual residence were more useful than those based on a present-in-area population. It was also pointed out that there could be a difference between the place at which information for each person was collected and the place to which the person was allocated for tabulation purposes.

120. Some participants were of the opinion that it was not yet possible to collect information in the Latin American countries on the basis of place of usual residence. Others stated that this might almost inevitably have to be done in the future and that its feasibility should be investigated in census tests. One participant mentioned that his country had found it feasible to tabulate household information on a usual-residence basis and individual data on a present-in-area basis.

121. There was general agreement, however, that the concept of usual residence was not a simple one to apply since it involved not only a question of fact but also of intention to remain in a given area. Its successful use demanded definitions of usual residence, temporary absence and internal migration, none of which had yet been recommended on either a world-wide or a regional basis. Important considerations of the best method of collecting information according to usual residence and of whether it would be feasible to determine for each individual and household both the usual place of residence and the area in which present at the time of the census were also involved.

122. Because of the complexities of the problem and the limited time for its discussion at the disposal of the Seminar, a small group of participants met in informal session for further discussion of experience in different countries. For the report on this meeting, see annex V of this document.

Checking, coding and editing of census questionnaires

123. The discussion was based on a document entitled "Checking, editing and coding of census questionnaires" (ST/ECLA/Conf.32/L.8).

124. The introduction to this document indicates the interrelationship between the three phases of the operations in the preparation for mechanical data processing, i.e., checking, editing, and coding, on the one hand and

between these operations and the mechanical data processing itself, on the other hand. It also explains the necessity for adequate organization and timely planning of these operations.

125. With regard to checking, the paper gives the main considerations governing the location of this operation, i.e., in or near the field and in the processing offices, and its content. The different methods of checking coverage and entry omissions are discussed in detail. A scheme for filling in entry omissions is presented. The document also refers to the types of codes; consideration is given to simple codes, where pre-coding is possible at the enumeration stage, and to complex codes, which have to be treated differently. The document gives some examples of the form of coding and refers to the modern techniques of quality control of coding by computer. Finally, it deals with automatic editing methods, as applied to entry omissions and to the checking of inconsistencies in census data.

126. The Seminar agreed that it is necessary to use the most simple and automatic methods of checking, coding and editing. But in addition to mechanical checking and editing, many countries used a manual operation in their last census. It was mentioned that not only the computer technique but also the use of sampling in these census operations speeds up data processing. The possibility of a combined editing and checking operation, based on both manual and mechanical methods, was also discussed.

127. It was felt that the use of pre-coding, as proposed in annex II of the document, is a very great help in the operations. Experience with the use of that method was generally very favourable. If a regional or sub-regional data processing centre is used, the complex coding which should be done by each country individually, must take account of the standard codes and the instructions relating to them. The national and local characteristics, names, occupations, etc., can however be better coded in a national centre than in a regional one. On the other hand, coding should not be too decentralized, because it is easier to ensure uniform coding practice in the central office.

Electronic processing of census data

128. The following documents served as a basis for discussion: "Electronic Processing of Census Data" (ST/ECLA/Conf.32/L.9 and Add.1) and "Electronic data processing in censuses of population and housing in the United States of America" (ST/ECLA/Conf.32/L.17).

129. Part I of the first of these documents recalls that most of the 1960 censuses were tabulated with conventional punch-card methods and that for many countries of the region the 1970 censuses will represent an initial exposure to the use of computer techniques. The document further describes both the advantages and the disadvantages of the computer.

130. Among the advantages described in the document are the tremendously greater potential for speed, versatility and accuracy than that of previous methods of processing census data. This new capacity represents a qualitative difference compared with earlier devices, and makes practical the use of new techniques in statistical operations. It is possible to transfer to the computer many manual operations, such as editing and correcting data, and assigning values when information is omitted in a questionnaire or when information is inconsistant or impossible. The computer can do these operations with strict consistency and uniformity and, by recording its actions, it provides a means of measuring the quality of the enumerated data. It also makes possible the development of more detailed or more informative statistics. At reduced cost, it can produce key ratios and relationships as incidental by-products of tabulations; it can handle more variables by more detailed cross-classifications, match census data with those from other sources, prepare final tables for printing by offset printing processes, and if magnetic tape is used, it requires only a fraction of the space normally needed for the storage of punch-cards.

131. The document also identifies some disadvantages involved in the transition to computers. These include the requirements for more systematic data organization, and the preparation of highly detailed and explicit instructions to the computer before it will proceed with any operation. Failure to consider all contingencies may bring the computer to a halt or result in the rejection of large numbers of records. For this reason, the programming and supervisory staff must be well trained and highly competent. Successful computer application demands a much higher degree of precision and discipline in planning census operations than was required with previous techniques.

132. There is a need, as the document points out, for early planning when computers are to be used. Data processing methods and equipment are directly related to the objectives and results of the census, and have a broad impact in virtually all operations. The data processing personnel should be

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represented in the planning and organization of the census from the very beginning as integral members of the over-all census planning group. The capacity, speed, and configuration of the computer have great bearing on the processing plan and in many cases will dictate the approach to the design of the enumeration form field work, coding, input preparation, editing and tabulation. Therefore, it is essential to decide, at least in general terms, on the equipment which will be used for processing the census data.

133. With respect to system design and programming, the document mentions the general tendency in all countries to underestimate the magnitude of the effort required to programme and install computer systems, the need for fully testing computer programmes, and the training requirements for efficient computer operations.

134. The addendum to the first document reviews some computer operations and gives special attention to some factors affecting the optimum use of computer capacity, the detection and correction of errors by the computer, and the production by the computer of final tables for photo-offset reproduction.

135. Document ST/ECLA/Conf.32/L.17 is specifically related to the experience of the United States in the development and uses of electronic data processing in censuses of population and housing. It emphasizes the need for early and intensive training of computer personnel, the development of a team approach that includes data processing experts in the planning of census and other statistical systems, and the importance of direct and understandable communication between those responsible for computer utilization and those guiding the decision-making processes.

136. The document summarizes the processing steps of the 1960 censuses; identifies changes in data processing equipment and techniques planned for the 1970 censuses; describes a number of problems that have been important stumbling blocks in the way of those learning how to use computers and how to increase the efficiency and effectiveness of their operators; and presents a distribution of census costs. Costs directly attributable to data processing for the 1960 US population and housing censuses amounted to approximately 13 million dollars. In addition capital outlays of about 5 million dollars were made for the purchase of electronic equipment, parts and magnetic tape, and the construction by the Census Laboratory of the Census Bureau's Film Optical Sensing Device for Input to Computers (FOSDIC) and the

purchase, construction or modification of other equipment. The total cost of the 1960 censuses of population and housing was approximately 102 million dollars.

137. The discussion of the documents presented to the Seminar was preceeded by the collection of the following information from participants about their current utilization of computers and plans for obtaining new computers:

23 countries were represented in the discussion of data processing;

14 countries now have computers available for this census and 9 do not;

13 of the countries which have computers have located them somewhere in the government;

9 of these countries have a computer located in the census or statistical office;

6 of these census or statistical offices charge computer time directly to each project;

5 of these offices do computer work for other public agencies;

5 of these offices also do computer work for private organizations;

4 of these offices charge for the computer work done for other agencies;

2 of these offices are authorized to use reimbursements received for computer work done for other agencies to pay for the costs of the work; the other offices must return their receipts to the treasury;

9 countries that now have computers available plan to use new computers for their next census;

Of the 9 countries which do not now have a computer available for the census:

5 plan to use a computer in their next censuses;
5 will use a computer located in the government;
4 will have the computer located in the census or statistical office.

It appears from this information that 19 of the 23 countries that participated in the discussion intend to use computers in their 1970 censuses of population and housing and that of the 14 countries that plan to buy new computers, 5 will be using computers for the first time.

138. The discussion of the problems presented by the expanded use of new electronic data processing equipment revealed an appreciation of many problems confronting the census authorities. Among these were the following:

(a) While the computer has great potentiality for the improvement of statistical systems, its mere presence will not solve problems,

but will in fact create new problems which will require the attention of professional and technically trained personnel. The introduction of new computers should not be expected to lead to immediate reductions in the cost or time requirements for data processing. Because more time is needed to train programmers and to write programmes than is generally available, the importance of early decisions with respect to the purchase or rental of a computer was stressed, and mention was made of the possibility that it may be too late to get a computer for a census to be taken in 1970. It should also be borne in mind that adequate physical preparations need to be made for the location of the computer if delays and extra costs are to be avoided.

(b) The need for reorganizing the census or statistical office when a computer is introduced was discussed and there was agreements that data processing must not be regarded as something to be decided upon after other census problems have been considered. Those responsible for data processing must be included in the earliest planning activities of the census, and they must have direct access to the director of the census or statistical office.

(c) A study undertaken for the purpose of determining the feasibility of using a computer requires both expert attention and the participation of the principal staff members who will be responsible for the supervision, programming and operation of the computer system. Such a study should include consideration of the problem of compatibility among computers. The availability of other computers that may be used in case of need and the ability to interchange programmes with other countries can be highly important.

(d) The use of computers may provide a means of reducing transcription errors if direct input of data can be accomplished through optical scenning of the original questionnaires. This input can be produced also by regional centres, which avoids the necessity for sending all material to the central office.

(e) If excessive programming time is required, this is due to lack of effective communication between subject matter specialists and programmers. There is a need to standardize specifications. The

use of decison tables was discussed as one such method. The use of standard computer languages such as Fortran or Cobol should be helpful.

(f) The salaries of computer personnel should be studied in each country to ensure levels that make it possible to retain trained personnel.

(g) Training for programmers should be initiated at as early a date as possible. Computer manufacturers generally provide only initial training. Where special institute or university training in systems analysis and programming is not available, the possibilities of securing training fellowships or grants through international or national organizations should be explored.

(h) Some countries may need consulting or technical assistance advisory services from international or other sources. Because of the increasing demand for such services prior to and during the 1970 world censuses of population and housing, full-time experts may not be available. In such cases, the needs might be met by short-term consultation.

(i) The use of sampling in the quality control of punch-card verification was mentioned as a means of cutting costs and saving time while keeping quality within established tolerances. If incentives can be provided for those whose performance is above the approved standards, production can be increased while costs are further reduced and the morale and income of the better operators are improved. In all aspects of data processing it is necessary to establish an acceptable margin of error.

(j) Great interest was shown in the electronic processing of census data, and several participants felt that it would be desirable to hold a special seminar on this subject.

Census publication programme

139. Under this item, the Seminar had before it a document entitled "Design and execution of a census publication programme" (ST/ECLA/Conf.32/L.10). This document points out that, by their nature, national censuses are not complete until the data collected have been compiled and published. As unpublished data are of no value to most of their potential users, a census

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limited to the investigation of a few important characteristics, the results of which are published as soon as possible after the enumeration, is better than a very detailed census which may jeopardize or prevent timely publication of the data collected.

140. However, there is no need to publish all the census results that have been tabulated, and some of the data may even be left untabulated until they are required.

141. In this respect, it is essential to have a soundly conceived plan that is carefully carried out. As the publication and tabulation plans are interrelated questions of publication must be decided during the early stages of the over-all plan.

142. It was pointed out that modern data-processing and reproduction techniques make it possible to publish census results more rapidly and at less cost than in the past. The final tables can be reproduced directly by the method of offset printing from those prepared by the computers. This obviates the need for subsequent ckecking, since the computer makes the necessary adjustments and prevents new errors.

143. The first stage of publication is that of the preliminary results, which are based on control lists and other information provided by the enumerators and are generally subjected to preliminary criticism and revision. Although subsequent changes in the data may impress public opinion unfavourable, the publication of the preliminary data affords too many advantages to be abandoned for this reason. The data in question gives population totals by sex, and the total number of living quarters by general type and principal administrative division, and they should be issued as soon as possible. They can be supplemented by data obtained by the sample method.

144. While acknowledging that publication of the preliminary results, is extremely useful, the participants pointed out that it might have the effect of postponing or even suspending publication of the final data.

145. The publication of final census results is the main purpose of all census publications. There should also be published an evaluation of the quality of the data, together with a description of census methods and procedures used, the organization, the problems encountered and their solutions, and a complete historical account of the census. The publication of this information can accompany the results or constitute a separate

volume. A further volume, possibly issued by a university in conjunction with the statistical and census office, might contain a scientific analysis of the data and a comparison with earlier census results.

146. During the discussion it was urged that each chapter of the census publications should be preceeded by full explanatory notes and that all such publications should be of the same size.

147. A price should be fixed for census publications so as to avoid unnecessary expenditure, although a certain number of copies would always be distributed without charge. Income from this source is usually very small in any case. It is difficult to calculate in advance the exact number of copies of the publications that will be needed. Too many may therefore be printed in some cases and too few in others. In any event, it is necessary to disseminate the publications more widely to the various statistical and census services. The Seminar paid tribute to the work done by the Inter-American Statistical Institute in that connexion.

Methods of evaluating the reliability of population and housing census data

148. Discussion of this item was based on the document entitled "Methods of evaluating the reliability of population and housing census data" (ST/ECLA/Conf.32/L.11) and the reference paper "Métodos de evaluación de los censos de población: algunas aplicaciones hechas por el CELADE" (ST/ECLA/Conf.32/L.18).

149. The basic document stressed the fact that the importance of census results and their influence on economic and social development programmes make it imperative to ascertain the degree of reliability of the information they contain, so that it can be effectively used, and that an understanding of the sources and causes of error in the census data is of great value for the improvement of future censuses.

150. Because most processing errors can be corrected during processing, it was assumed that the bulk of the errors in census results originated during the enumeration. Accordingly, attention was devoted to the causes of enumeration errors and their evaluation.

151. Errors in census enumeration were classified as errors of coverage and errors of content. Coverage errors are those which affect the total population figure or the total figure of living quarters and also the

distribution of the population and/or living quarters among the geographic divisions of the country. They can also affect the data on particular characteristics of the population if they occur primarily within a particular population group. They are attributable to omission or under-enumeration, duplication or over-enumeration, and erroneous inclusions.

152. Content errors include mistakes in reporting and/or recording information concerning the characteristics of living-quarters, households and individuals. These are errors which affect the quality of the results, as contrasted with quantitative errors, which affect their magnitude.

153. The basic objectives of a complete evaluation programme are to determine the level of accuracy of the census results especially in regard to the completeness of coverage; to indicate to the users of the data the limitations of the results; and to determine the causes of errors in the characteristics of the living quarters, households and persons involved. The first two provide the information concerning the reliability of the published data which are needed by the users of the statistics. The third is conducive to improvements in the methodology of future censuses and other statistical inquiries, and thus to the solution of some of the difficulties inherent in the compilation of social and economic statistics.

154. Among the direct methods of evaluation (those which involve the checking of census returns against independently obtained records) are field checks, comparison with records from various registers, and internal checks of duplication. Field checks include ad hoc post-enumeration sample field checks and also labour force surveys. Indirect methods of evaluation consist of the critical analysis of the internal consistency of the census results and of the way in which the results conform to expected values obtained from other sources.

155. The reference paper (ST/ECLA/Conf.32/L.18) illustrated some of the indirect methods applied by the Latin American Demographic Centre (CELADE) in evaluating specified results of the recent population censuses of a number of Latin American countries, and the findings of these evaluations.

Errors in census enumeration

156. It was agreed that the results of population and housing censuses in Latin American countries contained significant errors which seriously reduced the usefulness of the census contribution to programmes of economic and social development and to demographic studies per se. The attention of the Seminar

was drawn to the fact that certain kinds of errors in the population census results, such as under-enumeration of males in the 15-39 year age-group and an understatement of the total number of births to each woman, occurred repeatedly. Stress was laid on the great need for more information on the nature of these and other errors and on their causes, so that steps could be taken to reduce their extent.

Objectives of an evaluation programme

157. The Seminar agreed with the stated objectives of an evaluation programme but considered that generally these objectives have not been realized to any great extent in the region. It was felt that countries would have to examine their programmes to assess their success in supplying the kind of information which would enable users of the census data to determine a course of action on the basis of the census results. The view was expressed that often the only result of an evaluation programme was to inform the users of the data that the census was not successful, without giving the users an adequate indication of what might be the correct figures or, at least, what might be the degree of variability of the figures.

158. It was suggested that an order of priority should be set to insure that evaluation of the most important attribute distributions for immediate use (e.g., age, sex and economic characteristics) would be undertaken first.

159. The view was also expressed that, although evaluation of census results was of great importance, it was possible for the countries of the region to reduce enumeration errors significantly in their 1970 censuses simply by improving their enumeration methods. In particular, a lengthening of the period of enumeration, so that fewer enumerators would be required and they could be more adequately trained, would serve to eliminate many of the errors which are commonly known to exist in the region. Improvements of this kind would be of a more immediate benefit than complete evaluation programmes. It was, however, considered convenient that countries should experiment with alternative methods to evaluate coverage and content errors.

160. Finally, some participants explained the evaluation measures used in connexion with their 1960 censuses and the plans for evaluation of the 1970 census results.

/Direct methods

Direct methods of evaluation

161. Discussion of the direct methods of evaluation was almost entirely confined to the ad hoc post-enumeration field check, which was the principal direct method used in evaluating the results of the 1960 censuses in the region, although some brief mention was made of checking against information from various registers containing information on specific groups of the population. Use of independent registers for evaluation of census data is rarely possible in Latin America since such registers are, in most cases, deficient in many ways. This is specially important with respect to the registers of vital events (especially of births), which could otherwise serve as a direct evaluation measure.

162. Most participants were of the opinion that the ad hoc post-enumeration sample field checks used in an effort to evaluate the 1960 census in some countries of the region had not been successful. It was not possible to be certain that the results of the field check were more accurate than those of the original enumeration. In at least one case, it was felt that the great number of differences in replies received for the two enumerations might be as much a reflection of the poor quality of the field check as of the census enumeration. In another case, it was found that enumerator fatigue from two consecutive enumerations contributed to many errors in the field check.

163. In view of the high cost of sample re-enumeration and the relatively low benefits derived from it, some participants expressed serious doubts about the advisability of using this check in the 1970 censuses. Others, however, stated that their countries were still intending to conduct a post-enumeration field check in the next censuses. It was pointed out to the Seminar that such a field check is not a simple procedure and that it requires strict adherence to certain requirements if is to be effective. There is growing doubt that the post-enumeration field check will generally be successful in producing quantitative estimates of census errors, although it will be valuable in determining types of errors and their causes.

Indirect methods of evaluation

164. Great interest was displayed in the indirect methods of evaluation, such as those used by CELADE, and in the corrections it was applying to population census results in attempting to use the results for purposes of demographic research. A number of participants requested additional information about both the methodology and the results.

165. A substantial number of participants felt that such indirect methods (e.g., use of a "balancing equation" to assess the reliability of the total population figure revealed by a census, the application of life table functions to evaluate the reliability of the census age-distributions, and other techniques of measuring errors in reported characteristics of the population) were very good evaluation tools for the countries of the region. It was felt that one of the benefits of such methods was that they represented a much lower cost than the direct field methods.

166. It was brought to the attention of the Seminar, however, that even though the application of demographic methods might produce usable estimates of the total population and its distribution by various characteristics, the results were not a substitute for those of a good census and of a complete vital registration system. Furthermore, the indirect methods could reveal only the deficiencies in the census results but could not in themselves reveal the causes of the errors. It was still essential, therefore, for countries to continue to determine and to correct the causes of errors so that adequate first-hand information would be available for demographic studies and for the many other uses of census results.

167. Nevertheless, the valuable contribution that could be made to the evaluation of census results by such research bodies as CELADE was recognized and also the help that such bodies could provide to national census offices in pointing out the kinds of errors that were likely to appear in the census results. It was suggested that, to aid countries of the region which did not have the resources to conduct such evaluations themselves, it would be very useful if CELADE could apply its evaluation studies to groups of countries with similar population characteristics, in an effort to arrive at conclusions valid for each group as a whole. It was recognized, however, that this possibility might not be readily attainable because of the nature and extent of national differences, which make it necessary to evaluate the data of each country in different ways.

Sampling

168. The discussion of this item was based on a discussion paper, "Use of sampling in population and housing censuses" (ST/ECLA/Conf.32/L.12), and following reference papers: "Some application of sampling to population and housing censuses" (ST/ECLA/Conf.32/L.19); "Sampling applications in censuses of population and housing in the United States" (United States Bureau of

the Census) (ST/ECLA/Conf.32/L.20 and Add.1); "The role of sampling in population censuses its effect on timeliness and accuracy" (ST/ECLA/Conf.32/L.22); "The census sample operation programme (ONUECE) of the Latin American Demographic Centre (CELADE)" (ST/ECLA/Conf.32/L.23).

169. The discussion paper (ST/ECLA/Conf.32/L.12) divides sampling uses into two categories, namely, sampling as an integral part of the census, and the use of the census as a sampling frame for subsequent inquiries.

170. In the former category, the advantages and disadvantages of sampling are enumerated. The advantages of saving in time and money are the prime reasons for sampling being seriously considered in the census context. The document discusses important pre-conditions for acceptable sample operations, namely: consideration of the cost and census resources available for the design and execution of the sample, a statement of the precision demanded in the sample estimates, and the availability of a sample frame and the specification of the units to be sampled.

171. The document deals with the major areas in which sampling techniques are employed in a national census, including the following: (a) samples of census respondents for the purposes of obtaining responses to further census questions; (b) using post-enumeration checks to study the quality of the census data; (c) control of the quality of the census processing by quality control plans; (d) preparation of early provisional estimates of the census results; and (e) preparing additional studies by special tabulations of a sample of census records. The document also refers to the fact that tests of census procedures are in the category of uses of sampling.

172. The document submitted by the United States Bureau of the Census (ST/ECLA/Conf.32/L.20 and Add.1) traces the historical development of sampling in censuses of this country and indicates the factors that led to the decisions to adopt sampling. The document gives illustrations of uses of sampling in the major areas cited above.

173. The Seminar noted that these uses of sampling are evidence that modern experience in the use of sampling techniques has confirmed the fact that it is not necessary to gather all demographic and housing information on a complete basis; the use of sampling actually saves a good deal of time and money and furthermore, under certain circumstances, the sampling approach alone ensures data of acceptable accuracy.

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174. The Seminar recognized further that it is wrong to consider complete counts as being without error, and that it is also wrong to consider differences between complete counts and samples as reflecting the difference between truth and approximation.

175. The Seminar recognized that while the sampling processes may be simple, they often involve the work of large numbers of persons, and for this reason serious biases may be (and often are) introduced. It is then essential to set up and use controls of these procedures to detect and make corrections for the more serious defects introduced by some of the staff. There is ample evidence to show that sampling should not be used simultaneously with the census enumeration, if these processes of control are not employed.

176. The Seminar agreed that a more extensive use of sampling is necessary in all phases of census activities because of the advantages arising out of the savings in cost and time. The three main areas for increased uses of sampling in the region were considered to be: (a) enumeration of additional items of information by means of a sample; (b) preparation of provisional estimates; and (c) quality control of data processing operations.

177. A number of participants drew attention to the need of statistical experts to assist in the direction of many of the sampling and quality control tasks described. Several suggestions of ways of meeting these needs were put forward, including the following:

(a) Organizing a seminar dealing primarily with sampling procedures;

(b) Placing greater emphasis on the practical aspects of university training in statistics;

(c) Greater emphasis should be placed on sub-regional co-operation along the same lines as in Central America;

(d) More effective utilization of existing training programmes should be achieved. It was pointed out that as of now only about sixty students from ten participating countries have completed the course of CIENES which includes sampling, and of these students, the representative knew of only two who were still employed in statistical offices;

(e) Attempts should be made to solve the problem nationally, perhaps by supporting students at the national universities or at CIENES, or by sending students for study in universities of other countries.

/Attention was

Attention was also drawn to the shortage of sampling personnel with practical experience and to the need for training courses in the practical aspects of sampling;

(f) Other participants noted the difficulty of retaining competent statistical help once such help had been trained. It was agreed that special consideration should be given to statistical technicians, along with computer programmers, in order to increase the probability of their remaining with the statistical offices. It was noted that during a census, sampling questions were only one of a number of urgent and critical problems to arise; this further complicates the problem of keeping the trained statisticians working on sampling problems.

178. During the discussion, a number of participants described the experience of their countries in previous censuses or their plans to prepare preliminary tabulations based on a sample of census returns in the next census. In general, the procedure was reported to have produced useful results much earlier than the final census tabulations. Some participants indicated that, with the use of computers, less importance would need to be given to the use of sampling because computers would substantially reduce the time required to prepare the complete tabulation. Other participants felt that the use of computers for the first time in the next census might give rise to many large and unforeseen problems, and therefore the need of sampling for preliminary estimates should still be recognized.

179. Some participants reported the experience of their countries or their plans for collecting additional information in the census from a sample of census respondents. The usefulness of sampling to increase the scope of the census was recognized.

180. The savings arising out of the preparation of scientifically designed quality control systems was reflected in the reports of a few countries. It was felt that this use of sampling should be further exploited, particularly because of the savings to be gained in the time and cost of the processing operations.

181. It was pointed out that another use for the application of sampling in the population censuses was to collect sample cards from the various countries of the area, not only for purposes of an inter-American comparative analysis

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of the population, but also to facilitate a subsequent examination of population factors, in accordance with new tabulations which might be envisaged for the next censuses. CELADE's experience in the development of a programme for the collection of this material (OMUECE) showed that it was advisable to standardize the order of the questions on the census schedules and the codes used in the various countries, so as to facilitate the processing of the material compiled in the future, without prejudice, of course, to the countries' freedom to investigate subjects of special interest to them. It was noted that the Central American countries were already preparing their census activities for 1970 in close co-operation with each other, which would make it possible to standardize procedures. A number of countries, expressed their willingness to continue co-operating in the programme sponsored by the Latin American Demographic Centre.

Census tests and the experience of American countries in carrying out pilot censuses and surveys in connexion with 1970 censuses

182. The discussion of this item was based on the document "Census tests" (ST/ECLA/Conf.32/L.3) and on the following reference papers: "Censo de prueba de la comuna de Valdivia (Chile)" (ST/ECLA/Conf.32/L.14);* "El censo experimental de Costa Rica (informe preliminar)" (ST/ECLA/Conf.32/L.15)** and "Experiencia del censo experimental en la República Dominicana" (ST/ECLA/Conf.32/L.16 and Add.1).*

183. During the discussion several participants gave details on other pilot censuses, for which reference papers had not been prepared.

184. Census tests refer to all types of tests connected with a census, whether a questionnaire test only, a field trial or a pilot census. The volume of work that is required for the organization and execution of a census, and its high cost, make it advisable to use census tests. A population and housing census should be continuously modified, in the light of social and technological change, to satisfy the need for new information that such change demands. Even where there is no intention of making many changes in the national census, census tests will serve to check personnel

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* Available in Spanish only.

** A summary of this document is available in English.

training or to combine the training of personnel with the trial of new methods and questions, because if these are wrongly used, they may irreparably distort the general census data and results.

185. A census test can have different purposes, on which will depend the type of test to be made. A distinction can be drawn between general and special types of census tests. General census tests are intented to try out the three main stages of the census. These are: the preparatory work before the enumeration, the enumeration itself and the post-enumeration work (see document ST/ECLA/Conf.32/L.1). Special census tests are intended for one or more stages of the census operation, as well as to try out new methods. The most important special tests are those relating to the questionnaire, enumeration, and data processing.

186. In document ST/ECLA/Conf.32/L.3 information is given on the census tests which Argentina, Bolivia, Chile, Costa Rica, Cuba, the Dominican Republic, Mexico and Panama have carried out or are planning to carry out for the 1970 censuses. It was reported that Jamaica was planning to carry out a questionnaire test and a field trial in August-September 1969; that Peru intended to conduct pilot censuses in Ica (urban area) and Cuzco (rural area) in September 1969; that Trinidad and Tobago would undertake trials in an urban and a rural area in the course of 1969; that Venezuela would carry out a general test in the Victoria municipio in June 1968; and that in the Netherlands Antilles (Curaçao) a methodological and questionnaire test would be conducted in July 1970.

187. The Seminar was informed of the objectives of the methods applied in the pilot censuses in Chile (Valdivia area), Cuba (San Antonio de los Baños), Costa Rica (city of Grecia and two rural districts of this canton in Alajuela province), the Dominican Republic (Sabana Grande de Palenque) and Venezuela (Victoria). The main objectives, except in Costa Rica, were: (a) to train census personnel in census field work; and (b) to try out methods, procedures and forms of organization.

188. The experimental census in Costa Rica was conducted by CELADE in co-operation with the Statistics and Census Office and other international agencies. It represented an attempt to test methods of obtaining population data which might help to improve the quality of the information gathered in the Latin American countries.

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189. It was agreed that census tests of the kind described represent a valuable means of applying theoretical knowledge and that because of the long period between two population and housing censuses and the turn-over of census personnel, this practical experience is essential for the staff of national census offices about to engage in a full scale census. The census test is the only way of acquiring the necessary practical experience, which cannot be obtained in any other way. As local conditions differ, a number of tests should be carried out in various parts of the country. No attempt should be made to seek an ideal situation for the census tests, or to use only highly-qualified staff, since it will be impossible to find an ideal situation for the general census.

190. Census tests were considered to be indispensable even for countries with considerable statistical and census experience. As a rule, it is preferable to make several special tests rather than one general test, although the latter may be necessary in countries with little experience of taking censuses.

191. It was noted that certain aspects of population and housing censuses can and should be tested without necessarily using a complete coverage census test. For example, alternative questionnaires might be tried out on small population groups, the adequacy of cartography might be evaluated by means of field checks, etc. Attention was drawn to the fact that the preparations for a census test need to be just as carefully carried out as those for a full scale census if the results are to be a valid indication of census procedures.

192. One of the main problems with respect to testing census methodology which preoccupied the participants was the question of the period of time to be covered by the enumeration, i.e., whether the aim should be to carry out the enumeration in as short a period as possible with a large number of enumerators or whether efforts should be made to extend the time and use a smaller number of more highly qualified enumerators. It was agreed that tests of both approaches would provide countries with information on which to base their decision in this respect.

193. In connexion with the test of census publicity it was noted that in one country a copy of the census questionnaire had been published in the newspapers prior to the census test, and the relative advantages and disadvantages of

such a procedure were discussed. Some participants felt that this procedure helped to secure more accurate responses because it familiarized respondents with the questions. Others, however, considered that it might have the disadvantage of giving respondents who wished to conceal the truth an opportunity to plan their incorrect replies.

194. With respect to the CELADE experiment in Costa Rica, attention was drawn to the value of tests for the purpose of evaluating alternative methods of framing questions and also determining the best sequence. Particular attention was given to the efficacy of alternative methods of collecting information on fertility in a census.

Annex I

LIST OF PARTICIPANTS

1. Countries

ARGENTINA

Participants:	María J. Cerisola	Chief, Population Division, National Statistics and Census Office
	Enrique Spadari	Director of Statistics and Censuses, Province of Buenos Aires
Observer:	Jorge Fernández-Bussy	Statistical Adviser, Statistical Office, Province of Buenos Aires

BARBADOS

Participant:	Charles G. Alleyne	Director, Statistical Service

BRAZIL

Participant:	Heitor Da Camara Vellozo	Director, Census-Taking Division, Brasilian Geographical and Statistical Institute

BRITISH HONDURAS (BELIZE)

Participant:	Donald R. B. Gill	Head of Planning Unit, Ministry of Finance

CHILE

Participants:	Sergio Chaparro	Director of Statistics and Censuses
	Omar Rojas	Executive Director of the Census, Statistics and Census Office

/Observers:

Observers:	Osvaldo Pérez	Chief, Geography and Census Department, and Mechanical Processing Department, Statistics and Census Office
	María Eugenia Baltra	Chief, Population Department, Statistics and Census Office
	Héctor Kappes	Chief, Research Department, Statistics and Census Office
	Odette Tacla	Chief, Population Analysis and Estimates Division, Statistics and Census Office
	Fresia Donoso	Chief, Population Analysis and Estimates Section, Statistics and Census Office
	María Angélica Marín	Chief, Vital Statistics Division, Statistics and Census Office
	María Miranda	Ministry of Housing
	Claudio Vila	Research specialist, Centre for Statistical and Mathematical Studies (CEDEM), Universidad de Chile
COLOMBIA		
Participant:	Alvaro Pachón	Chief, Organization of Population and Housing Censuses, National Statistics Administration
COSTA RICA		
Participant:	René Sánchez	Director-General of Statistics and Censuses
CUBA		
Participant:	Ramón Sabadi	Chief, Census Department, Central Planning Board
DOMINICAN REPUBLIC		
Participants:	Manuel de Jesús Goico	National Director of Statistics
	Aníbal Castaing	Director, Population and Housing Censuses Department, National Statistical Office
Observer:	Adolfo Gaete	United Nations Expert in Vital Statistics and Censuses

/ECUADOR

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Participant:	Jaime Espinoza	Chief, Population and Housing Section, Statistics and Census Division, National Economic Planning and Co-ordination Board
EL SALVADOR		
Participant:	Luis Raúl Rodríguez	Deputy Director, Statistics and Census Office
GUATEMALA		
Participants:	Edgardo Nájera	Director-General of Statistics and Censuses
	René Arturo Orellana	Technical Co-ordinator of Censuses and Surveys, Statistics and Census Office
GUYANA		
Participant:	Joseph John	Acting Chief Statistician, Statistical Bureau
HAITI		
Participant:	Roger Mellon	Chief, Population Department, Haitian Statistical Institute
HONDURAS		
Participant:	Roberto H. Rosales	Technical Census Adviser, Statistics and Census Office
JAMAICA		
Participant:	Dexter L. Rose	Director, Department of Statistics
MEXICO		
Participant:	Rubén Gleason	Director-General of Statistics
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PANAMA

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PERU

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TRINIDAD AND TOBAGO

Participant:	Vincent Bailey	Chief Census and Surveys Officer, Central Statistical Office

UNITED STATES OF AMERICA

Participants:	Charles B. Lawrence, Jr.	Assistant Director for International Statistical Programmes, Bureau of the Census
	Robert H. Hanson	Assistant Chief for Programmes, Statistical Methods Division, Bureau of the Census
	Milton D. Lieberman	Deputy Chief, Manpower and Research Division, Population Service, Agency for International Development

URUGUAY

Participant:	César Vásquez	Member of the Advisory Board for Statistics and Censuses

VENEZUELA

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2. United Nations specialized agencies

INTERNATIONAL LABOUR ORGANISATION (ILO)

Luis Cabrero	Expert in Labour Statistics
Eduardo Troncoso	Ottawa Plan Expert

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)

Linda Nelson	Regional Home Economist

WORLD HEALTH ORGANIZATION/PAN AMERICAN SANITARY BUREAU (WHO/PASB)

Raúl Vargas	Regional Statistical Adviser, Pan American Health Organization/World Health Organization
Luis Dorich	Housing and Town Planning Adviser

3. Other United Nations bodies

LATIN AMERICAN DEMOGRAPHIC CENTRE (CELADE)

Valdecir López	Statistical Expert
Julio Morales	Population Expert
Carmen Arretx de Fretes	Population Expert

LATIN AMERICAN INSTITUTE FOR ECONOMIC AND SOCIAL PLANNING (ILPES)

Esteban Lederman	Chief, Human Resources Unit

4. Inter-governmental organizations

LATIN AMERICAN STATISTICAL INSTITUTE (IASI)

Bolívar Nieto	Specialist in Population Statistics

INTER-AMERICAN STATISTICAL TRAINING CENTRE (CIENES)

Oscar Miranda	Lecturer
Raúl Conde	Lecturer

/5. Secretariat

5. Secretariat

Pedro I. Mendive	Assistant Executive Secretary, Economic Commission for Latin America (ECLA)
Gustaaf F. Loeb	Director, Statistical Division, Economic Commission for Latin America
Beatrice R. Diamond	Statistical Office of the United Nations
Camille C. Le Long	Statistical Office of the United Nations
András Klinger	Chief, Demographic and Social Statistics Section, Economic Commission for Latin America
Rodrigo Bolaños	Chief, Statistical Section, Economic Commission for Latin America, Mexico Office
Roe Goodman	Regional Adviser on Sampling, Economic Commission for Latin America

Annex II

LIST OF DOCUMENTS

1. Discussion Documents	Source
Planning of a population and housing census (ST/ECLA/Conf.32/L.1)	Secretariat of the Economic Commission for Latin America (ECLA)
Co-ordination between housing censuses and population censuses and of these censuses with other statistical inquiries and compilations (ST/ECLA/Conf.32/L.2)	Statistical Office of the United Nations
Census tests (ST/ECLA/Conf.32/L.3)	ECLA secretariat
Cartography for census purposes (ST/ECLA/Conf.32/L.4)	Issued by the Statistical Office of the United Nations in collaboration with the Cartography Section of the Resources and Transport Division of the Department of Economic and Social Affairs. Prepared by Marvin F. Gordon, Associate Professor, Department of Geography and Regional Science, George Washington University, Washington, D.C., United States of America, Consultant to the Secretariat
General considerations relating to the selection of topics, tabulation and publication of data in the censuses of population and housing (ST/ECLA/Conf.32/L.5)	Inter-American Statistical Institute
Preparation of the census questionnaire and instructions for enumeration (ST/ECLA/Conf.32/L.6 and Add.1)	ECLA secretariat
The enumeration (ST/ECLA/Conf.32/L.7)	ECLA secretariat
Checking, editing and coding of census questionnaires (ST/ECLA/Conf.32/L.8)	ECLA secretariat
Electronic processing of census data. Part I. Machine processing of census data (ST/ECLA/Conf.32/L.9)	Secretariat of the Economic Commission for Asia and the Far East (ECAFE) for the Seminar on the Organization and Conduct of Population and Housing Censuses held at Bangkok, Thailand 24 November to 1 December 1967, for the countries of the ECAFE region

/Electronic processing

Document	Source
Electronic processing of census data. Part II. Some principles of computer processing of census data (ST/ECLA/Conf.32/L.9/Add.1)	Statistical Office of the United Nations
Design and execution of a census publication programme (ST/ECLA/Conf.32/L.10)	ECLA secretariat
Methods of evaluating the reliability of population and housing census data (ST/ECLA/Conf.32/L.11)	Statistical Office of the United Nations
Use of sampling in population and housing censuses (ST/ECLA/Conf.32/L.12)	Statistical Office of the United Nations
The preparation and use of census control lists (ST/ECLA/Conf.32/L.13)	Statistical Office of the United Nations
Censo de prueba de la comuna de Valdivia, Chile, abril de 1967 (ST/ECLA/Conf.32/L.14)*	Bureau of Statistics and Census, Chile
Censo experimental de Costa Rica. Informe preliminar (ST/ECLA/Conf.32/L.15)*	Latin American Demographic Centre
El censo experimental de población y habitación del distrito municipal Sabana Grande de Palenque, 17-18 julio 1963, planificación y organización (ST/ECLA/Conf.32/L.16 and Add.1)*	Manuel de Jesús Goico, Director-General of Statistics, Dominican Republic
Electronic data processing in censuses of population and housing in the United States of America (ST/ECLA/Conf.32/L.17)	Charles B. Lawrence, Jr., Assistant Director for International Statistical Programs, United States Bureau of the Census
Métodos de evaluación en los censos de población: Algunas aplicaciones hechas por CELADE (ST/ECLA/Conf.32/L.18)*	Latin American Demographic Centre

/Some applications

Document	Source
Some applications of sampling to population and housing censuses (ST/ECLA/Conf.32/L.19)	ECLA secretariat
Sampling applications in censuses of population and housing (ST/ECLA/Conf.32/L.20 and Add.1)	Joseph Waksberg and Robert H. Hanson, United States Bureau of the Census
Co-ordination of censuses and inter-censal sample inquiries on population and housing data (ST/ECLA/Conf.32/L.21)	Joseph Waksberg and Robert H. Hanson, United States Bureau of the Census
The role of sampling in population censuses. Its effect on timeliness and accuracy (ST/ECLA/Conf.32/L.22)	Joseph Waksberg, Chief, Statistical Methods Division, United States Bureau of the Census
Una aplicación del muestreo de los censos de población: El programa Omuece de CELADE) (ST/ECLA/Conf.32/L.23)*	Latin American Demographic Centre

2. Reference documents

A. General

Principles and Recommendations for the 1970 Population Censuses, Statistical Papers, Series M, Nº 44, New York, 1967 (UN publication, Sales Nº 67.XVII.3)

Principles and Recommendations for the 1970 Housing Censuses, Statistical Papers, Series M, Nº 45, New York, 1967 (UN publication, Sales Nº 67.XVII.4)

Handbook of Population Census Methods, Studies in Methods, Series F, Nº 5, Rev.1, New York, 1958 (United Nations publication, Sales Nº 58.XVII.6), Vol. I-III

Programme for the 1970 Census of America (COTA-1970): Census of Population: Proposed Standards, Inter-American Statistical Institute IX COINS, Venezuela, August 1967 (IASI document 5392)

Programme for the 1970 Census of America (COTA-1970): Census of Housing: Proposed Standards, Inter-American Statistical Institute IX COINS, Venezuela, August 1967, (IASI document 5424)

Organization and Conduct of Population Censuses, Report of the United Nation's European Regional Seminar, Turkey, June 1965, Conference of European Statisticians, Statistical Standards and Studies, Nº 8, New York, 1967 (UN publication, Sales Nº 67.II.E./Mim 13)

/B. Others

B. Others

Encuesta Demográfica Experimental de Cauquenes, Chile, Centro Latinoamericano de Demografía, Santiago, 1968.*

Guatemala, Censos 1964, Población y Vivienda, Ministerio de Economía, Dirección General de Estadística, República de Guatemala, mayo de 1968.*

1960 Censuses of Population and Housing, Procedural History, U.S. Department of Commerce, Bureau of the Census, Washington D.C., March 1966.

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* Available only in Spanish.

Annex III

LATIN AMERICA: DATES OF THE LAST AND THE NEXT POPULATION AND HOUSING CENSUSES

	Last census	Next census
Argentina	30-IX-1960	1970
Bolivia	5-IX-1950	1969a/
Brazil	1-IX-1960	V-1970a/
Colombia	15-VII-1964	1971
Chile	29-XI-1960	IV-1970a/
Ecuador	25-XI-1962	XI-1972a/
Paraguay	14-X-1962	...
Peru	2-VII-1961	5-VII-1970a/
Uruguay	16-X-1963	Undicided
Venezuela	26-II-1961	III-IV-1970a/
Costa Rica	1-IV-1963	Between 1970 and 1973
Cuba	28-I-1953	1969 or 1970a/
El Salvador	2-V-1961	V-1970a/
Guatemala	18-26-IV-1964	IV-1970a/
Haiti	7-VIII-1950	...
Honduras	17-IV-1961	VI-1970a/
Mexico	8-VI-1960	1970a/
Nicaragua	25-IV-1963	...
Panama	11-XII-1960	10-V-1970a/
Dominican Republic	7-VIII-1960	25-26-I-1970a/
Barbados	7-IV-1960	IV-1970a/
Guyana	7-IV-1960	IV-1970
Jamaica	7-IV-1960	IV-1970
Trinidad and Tobago	7-IV-1960	IV-1970b/
Netherlands Antilles	27-VI-1960 31-XII-1960	2-5-I-1971
British Honduras (Belize)	7-IV-1960	IV-1970

Sources: United Nations, Progress report on the 1970 world population and housing census programmes, Statistical Commission, fifteenth session, (E/CN.3/378), 8 January 1968; and information furnished directly by countries.

a/ Provisional.
b/ Population census only.

Annex IV

ELEMENTS OF A CENSUS CALENDAR

I. PREPARATORY STAGE

A. Preliminary studies

01 Studies of previous census records
02 Studies on applicability of methods and procedures
03 Analysis of data requirement
04 Considerations on valid legal provisions
05 Control of existing cartographic materials

B. General program preparation

06 Determination of objectives
07 Discussion on census scope
08 General outline of census programme
09 Preliminary census calendar

C. Census organization

10 Preparation of legal basis
11 Determination of responsible office for the census
12 Organization (or extension) of central census office
13 Appointment of regional census commissioners
14 Organization of census commissions
15 Organization of field offices
16 Final detailed calendar

D. Financial and personnel plan

17 Preliminary estimates of expenses
18 Preliminary estimates of personnel
19 Staff recruitment (central office)
20 Staff recruitment (field offices)
21 Staff training (central office)
22 Staff training (field offices)

E. Pilot census

23 Preliminary selection of census topics (after discussions)
24 Preliminary tabulation plan
25 Draft questionnaire and instructions for pilot census
26 Plan of enumeration for pilot census
27 Plan of data processing for pilot census
28 Execution of pilot census
29 Analysis of the results of census tests

/Annex IV (continued 1)

Annex IV (continued 1)

II. PRE-ENUMERATION STAGE

F. Final programme preparation

30 Final tabulation programme
31 Final form of questionnaire
32 Definitions and classifications for data processing
33 Instructions for enumerators
34 Printing of questionnaires and instructions

G. Enumeration plan

35 Enumeration methods and procedures
36 Date and period of enumeration

H. Data processing plan

37 Processing methods, form and place
38 Organization of data processing
39 Planning and programming of data processing
40 Forms, materials instructions for data processing
41 Training of personnel for data processing

I. Publication plan

42 Design of publication programme
43 Assuring of printing facilities

J. Plan of sampling

44 Scope of sampling application
45 Detailed plan of sampling operations

K. Geographic work

46 Determination of territorial divisions and their limits
47 Preparation of census maps
48 Preparation of geographic codes
49 House identification (numbering, etc.)
50 Living quarter (household) listings
51 Determination of enumeration areas

L. Publicity

52 Design of publicity program
53 Execution of census propaganda

M. Preparation of enumeration

54 Despatch of questionnaires to field
55 Appointment of enumerators
56 Training of enumerators
57 Distribution of census materials
58 Preliminary survey of areas by enumerators

/Annex IV (conclusion)

Annex IV (conclusion)

III. ENUMERATION STAGE

N. Enumeration

59 Collection of census data
60 Supervision by supervisors
61 Supervision by field officers

IV. POST-ENUMERATION STAGE

O. Post-enumeration field work

62 Receiving the questionnaires
63 Preliminary checking questionnaires
64 Communication of preliminary summaries to central office
65 Despatch of census materials

P. Receiving and checking of materials

66 Receiving of materials
67 Checking the material (in central office)
68 Verification of completeness of coverage

Q. Data processing

69 Editing
70 Coding
71 Control of editing and coding
72 Punching
73 Tape-preparation, etc
74 Automatic correction and detection of errors
75 Advance tabulation (sampling basis)
76 Final tabulation (general data)
77 Final tabulation (special data)

R. Evaluation of results

78 Post enumeration field survey
79 Tabulation of post-enumeration survey
80 Analysis of the post-enumeration data
81 General evaluation of census data

S. Publication and analysis

82 Publication of provisional totals
83 Publication of provisional data
84 Publication of final data (general)
85 Analysis of census data
86 Publication of analytical study
87 Publication of final data (special)
88 Publication of administrative report
89 Preparation and publication of special surveys and studies

T. Recording of experiences

90 Systematic and continuous recording of experiences for the next census

Annex V

Report of the special meeting on place of census enumeration

1. During its discussion of the item "The enumeration" (on 24 May 1968), the Seminar on the Organization and Conduct of Population and Housing Censuses for Latin America requested some of its participants to discuss in detail the problems of the place of enumeration, and especially the procedures for enumerating the "present-in-area" and "resident" population.

2. This group of participants met on 27 May 1968 in informal session and discussed the requirements and possibilities for enumerating and tabulating information on the resident population. Participants in the Seminar from Brazil, Chile, Panama, Trinidad and Tobago, and Venezuela, and staff members of the Latin American Demographic Centre (CELADE), ECLA and the Statistical Office of the United Nations took part in the meeting.

3. The participants in the informal meeting agreed in general on the usefulness of information on the resident population because of the increasing need for data on households and families, housing and internal migration. They also agreed that tabulations based on place of usual residence were more useful for economic and social development planning than those based on present-in-area population. It was felt, however, that information on the present-in-area population was also required. A preference was therefore expressed for an enumeration which would make it possible to tabulate both present-in-area and resident population groups.

4. For this purpose, three categories of persons must be distinguished at each phase of the enumeration. These are:

A. Persons usually resident and present on the day of the census;

B. Persons usually resident but temporarily absent on the day of the census;

C. Persons not usually resident but temporarily present on the day of the census.

Categories A and C comprise the present-in-area population, which is obtained by what is termed a de facto enumeration. Categories A and B comprise the resident population, which is obtained by what is termed a de jure enumeration. Therefore, in order to compile both the present-in-area and the resident population, it is necessary either, (a), to collect some information on category B in the de facto enumeration, or (b), to collect

/some information

some information on category C in the de jure enumeration. In both cases, it is essential to indicate the category into which each person shown on the census questionnaire falls, so that the appropriate components of the population can be combined to produce both the total present-in-area population and the total resident population.

5. The enumeration and definition of the two different population groups in the two different types of census can be summed up as follows:

	Basic enumeration	Subsidiary enumeration
De facto census	A and C	B
De jure census	A and B	C

Irrespective of the method used in the enumeration the present-in-area population can be defined as A plus C, and the resident population as A plus B.

6. Country experience in the 1960 censuses showed that the greatest problem in distinguishing between residents and non-residents in the enumeration was caused by the fact that there was no clear definition of what constituted "usual residence" on the basis of which it would be possible to differentiate easily between the residents and non-residents of a household and which would ensure that persons treated as temporarily absent residents of one household were treated as temporarily present in the household in which they were found at the time of the census.

7. It was agreed that it would be desirable to have a single regional definition of "usual residence" but that it would not be possible to arrive at a suitable definition for the present. It was recognized that any definition would have to take into account the duration of the individual's stay at a given place, or of his absence therefrom, and also the cause of the stay or the absence. It was also agreed that, no matter how "usual residence" was defined for census purposes, the concept was frequently difficult for enumerators and respondents to apply. To ensure consistency, it was preferable to collect information which would make it possible for the final distinction between residents and non-residents to be made at the processing rather than the enumeration stage.

8. The experience of the last censuses and the few existing plans for the next censuses showed that two different practices exist:

(a) The instructions for the enumeration give a very simple definition of "resident" and "non-resident", or sometimes even leave it to the

enumerator or the respondent to make the distinction. Generally, persons "who live permanently in the dwelling or in the household" are considered to be residents, and no further details are given;

(b) The questionnaire asks direct questions to distinguish between residents and temporarily present persons. These questions include information on:

Place of residence

Duration of temporary presence

Cause of temporary presence

With these subsidiary answers it is possible to establish an exact criterion on the basis of which a clear distinction could be drawn between residents and non-residents.

9. The answers to these questions would provide a basis for defining the resident population, in accordance with the following criteria although it was recognized that every possible case would not be covered:

(a) All persons usually resident in the place of enumeration belong to the resident population;

(b) The term "usually resident" means that the person:

(i) Has no other place of residence (i.e., his only place of residence is the place of enumeration);

(ii) Lives somewhere else but works or studies at the place of enumeration, that is he usually lives in a place other than his "official" or "legal" residence (i.e., his answer to the question on "Cause for temporary presence" is "Work" or "Study");

(iii) Has another place as place of residence (when using an official or legal criterion) but has been living at the place of enumeration for a relatively long period. It is very difficult to generalize about the length of this period but normally it cannot be shorter than one month or longer than one year (the answer to the question on "Duration of temporary presence" can be used for this purpose).

10. Naturally, in order to have a complete picture of the two population categories, in addition to the present-in-area population, the temporarily absent residents (defined in paragraph 4 as population in category B) can also be enumerated and asked the following subsidiary questions:

Place where found on the day of the census;

Duration of absence;

Cause of absence.

11. The answers to these questions would provide a basis for defining on the absent population, in accordance with the criteria given in paragraph 9. This means that temporarily absent residents are those persons who usually live in the place of enumeration, but are absent:

(a) For a temporary cause (like a vacation, hospitalization, a visit, an excursion, etc.) which is given in the answer to the question on "Cause of absence" but not because of their work (these are not considered to be "absent");

(b) For a relatively short period (which should be the same period as the one accepted for the distinction between residents and non-residents, and which should not be shorter than one month or longer than one year). The length of the period is defined in the answer to the question on "Duration of temporary presence".

12. In practice it is preferable to enumerate all persons who live in the household, including the persons "absent but resident" (whose "place of residence" is the place of enumeration). Subsequently, during the checking phase, on the basis of these subsidiary questions, persons are accepted as "temporarily absent" only where the cause and duration of absence correspond to the criteria used in the census. Other persons are excluded from this category and are considered as residents at their "place of enumeration", even if the household regards them as members. Some countries, as they have information on this group, define another population category and call them "permantly absent persons" or "persons absent for a long period of time", and they use these data in some household and family tabulations.

13. It was agreed that there are broadly two basic procedures for collecting and tabulating information on both the "present-in-area" and the "resident" population. These are:

(a) In terms of the three categories listed in paragraph 4, information is collected, in the customary manner, either for categories A and B or for categories A and C, with the correct category indicated for each person. In addition, however, the names of all persons in either category C or category B, as appropriate, or at least the numbers of these persons, are also entered on the

questionnaire. This makes it possible to tabulate both total "present-in-area" and the total "resident" population even though the tabulations of the population by various characteristics are prepared entirely for only one of the two groups.

(b) Complete information is collected for all three categories of persons, with the correct category indicated for each person. This makes it possible to prepare all tabulations on the basis of "present-in-area" and/or "resident" population.

14. Because of the difficulties in applying the definition of "usual residence", the distinction between the two groups of the population may not be accurate, particularly if it is made at the time of enumeration. Persons absent from their usual residence may be enumerated as usual residents at more than one place (that is, at their residence and at the place where they are found at the time of the census), thus inflating the national "resident" total; they may be properly enumerated at the place where they are found but overlooked at their usual residence, thus deflating the "resident" count; or they may be properly enumerated at their residence but overlooked at the place where they are found, thus deflating the "present-in-area" total. In addition, even though they are included correctly at both places, conflicting information about their characteristics may be supplied.

15. To correct these kinds of errors, it is necessary, before the data are processed, to match and check the information for all persons entered on the questionnaires as absent residents and as non-residents temporarily present, in order to ensure that the former are included as temporarily present at some other place (or known to be out of the country) and that the latter are included as absent residents at some other place (or known to have no residence in the country). Omission discovered can then be corrected by transferring the relevant information to the place at which the person was omitted. Where it is found that persons have been properly included in both cases but that conflicting information was collected about some of their characteristics, re-enumeration may be considered to be in order.

16. The matching and checking technique is, of course, long and costly and it requires full information on names and addresses (both usual and temporary). It was felt that it could not be widely used at the 1970 censuses in the ECLA countries but that it might be possible to use method (b), without employing the matching technique, in order to obtain at least approximate data on the

"resident" population when enumeration is geared basically to the "present-in-area" population, or vice versa. They were, however, aware that unchecked data might be seriously misleading.

17. In conclusion, the participants of the group agreed that:

(a) Countries should test enumeration procedures that would permit identification of both groups of the population;

(b) It would be helpful if countries exchanged complete information on their experiences with these operations;

(c) The secretariat should prepare a report on the special meeting and present it as an annex to the final report of the Seminar.

18. After the meeting, a questionnaire was distributed to the participants in the Seminar, in order to obtain more information on national experience of this subject.

On the basis of answers from 18 countries, the following practices were observed:

10 countries asked directly the "place of residence";

3 countries asked directly the "duration of temporary presence";

2 other countries used this distinction in the instruction only;

7 countries made a distinction, in the tabulation, between residents and temporarily present persons;

4 countries based this distinction on the length of temporary presence; (3 of them accepted 6 months and one country 1 month as the maximum for "temporary presence").

19. The basis for the definition of "residence" was as follows:

In 9 countries the legal criterion;

In 3 countries the duration of presence (or absence); and

In 1 country the cause of presence (or absence).

7 countries enumerated the "temporarily absent but usually resident" persons;

2 countries asked directly where absent residents were at the time of the census;

3 countries made a distinction between permanent and temporary residents (2 of them accepted a "legal" and 1 a "duration" basis);

1 country also enumerated the permanently absent in a different way from the temporarily absent.

/20. The

20. The information collected on the experience of 16 countries in the last census tabulations indicated that the following number of countries based their tabulation on the present population or on the resident population:

Topics	Based on present population	Based on resident population
Preliminary population data	13	5
General population data	13	5
Migration data	11	7
Economic characteristics	13	5
Household (family) data	12	6
Housing data	12	6