CHAPTER 2

ADMINISTRATIVE DIVISIONS OF SRI LANKA

Censuses have traditionally provided population data for the entire hierarchy of administrative sub-divisions of the country. The utility and hence the demand for such data has risen with the increasing emphasis placed by the Government in the decentralisation of administration, extending not only to districts but down to Assistant Government Agent (AGA) divisions and even beyond to Gramasewaka (GS) divisions. Administrative divisions of the country have been subject to frequent changes when existing divisions were amalgamated or fragmentated in to new divisions as necessitated by political and other considerations.

This chapter outlines the historic development of the system of administrative divisions and briefly describes the administrative divisions in effect at the time of the 1981 census of population and housing.

A. PROVINCES

The current system of administrative demarcations is a gradual development of the provincial demarcations established in 1833 by the British rulers upon recomendations of the Colebrooke Commission.

By proclamation of 1.10.1833, the country was demarcated into five provinces for purposes of administration. These five provinces were named Northern, Southern , Eastern, Western and Central, following compass directions. The aerial distribution of these provinces as depicted in the Report of the Colebrook.Commission is seen in Figure 2.1.

As administrative and fiscal functions of the provincial administration expanded, the number and aerial boundaries were changed. The chronological order of these changes are as follows;

(1) The Western Province was divided into two as North Western and Western with effect from 1 October 1845.

(2) The North Central Province was created by amalgamating the Nuwarakalawiya district (the present Anuradhapura district) from Northern Province, Thamankaduwa district from Eastern Province and Demala Pattuwa of Sevenkorale from North-Western Province with effect from 6 September 1873.

(3) The Central Province was divided into two as Central and Uva with effect from 5 February 1886.

(4) The Western Province was divided into two as Western and Sabaragamuwa with effect from 4 January 1889.

Thus, in 1889 there were 9 provinces. Since then the provincial composition has remained unchanged except for occasional boundary adjustments.

B. DISTRICTS

When the 5 provinces were established in 1833, each province was constituted of several districts and there were 23 districts in all.
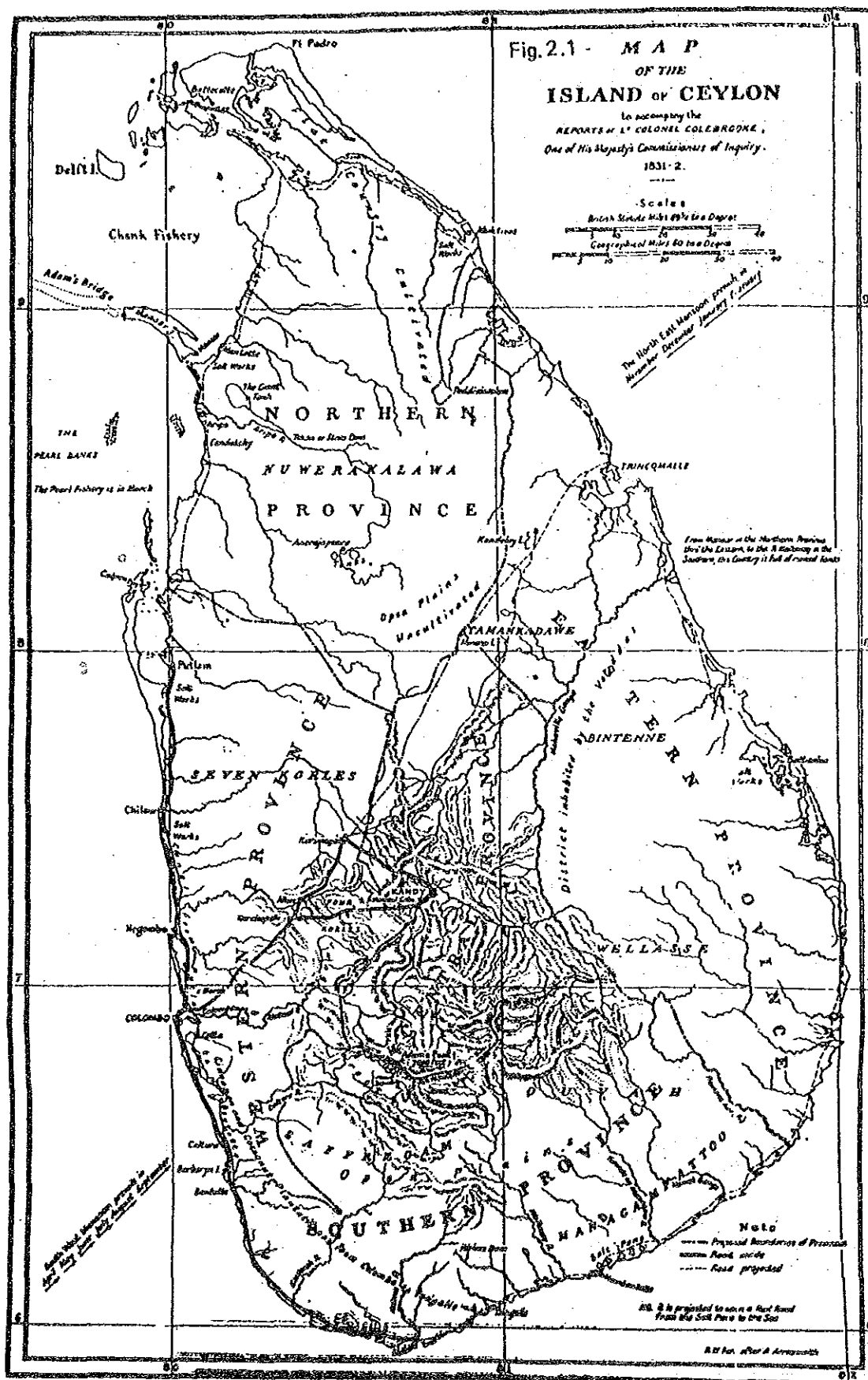
Fig. 2.1 - MAP OF THE ISLAND OF CEYLON

Table 2.1   DISTRICTS IN SRI LANKA AS AT CENSUSES, 1871 - 1981

District	1871	1881	1891	1901	1911	1921	1931	1946	1953	1963	1971	1981
Colombo	X	X	X	X	X	X	X	X	X	X	X	X
Negambo		X	X									
Gampaha												X
Kalutara		X	X	X	X	X	X	X	X	X	X	X
Kandy	X	X	X	X	X	X	X	X	X	X	X	X
Matale	X	X	X	X	X	X	X	X	X	X	X	X
Nuwara Eliya	X	X	X	X	X	X	X	X	X	X	X	X
Badulla	X	X	X	X	X	X	X	X	X	X	X	X
Galle	X	X	X	X	X	X	X	X	X	X	X	X
Matara	X	X	X	X	X	X	X	X	X	X	X	X
Hambantota	X	X	X	X	X	X	X	X	X	X	X	X
Jaffna	X	X	X	X	X	X	X	X	X	X	X	X
Mannar	X	X	X	X	X	X	X	X	X	X	X	X
Vavuniya		X	X					X	X	X	X	X
Mullaitivu	X	X	X	X	X	X	X					X
Batticaloa	X	X	X	X	X	X	X	X	X	X	X	X
Ampara										X	X	X
Trincomalee	X	X	X	X	X	X	X	X	X	X	X	X
Kurunegala	X	X	X	X	X	X	X	X	X	X	X	X
Puttalam	X	X	X	X	X	X	X	X	X	X	X	X
Chilaw			X	X	X	X	X	X	X			
Anuradhapura	X	X	X	X	X	X	X	X	X	X	X	X
Polonnaruwa										X	X	X
Monaragala										X	X	X
Ratnapura	X	X	X	X	X	X	X	X	X	X	X	X
Kegalle	X	X	X	X	X	X	X	X	X	X	X	X
Total number of districts	18	21	22	20	20	20	20	20	20	22	22	24

District boundaries have undergone frequent changes and as a result the district composition has changed from one census to another. The districts of the country as at each census are tabulated above in Table 2.1. The changes that have taken place in the composition and boundaries of districts are far too numerous and a documentation of all the changes is beyond the scope of this chapter.

At the census of 1871 there were 18 districts as shown in the Table. Subsequently, Negombo, Kalutara and Vavuniya districts were created in 1875, 1876 and 1879 respectively. Therefore, there were Twenty-one districts during the Census of Population in 1881.

In November 1887, the Puttalam District of North-Western Province was divided into two as Puttalam and Chilaw districts. Therefore, the island was divided into twentytwo districts at the census of population 1891.

In 1875, Negombo district was constituted with Alutkuru korale and Hapitigama korale detached from the Colombo district. The lifetime of this district was 21 years for it was reallocated to Colombo district in 1896. The district of Vavuniya was abolished in 1898 and the boundaries of all districts in the Northern Province were adjusted. In this adjustment process the Tunukkai division was detached from Mullaitivu district and attached to Jaffna district; the Panankamam division of Vavuniya district was attached to Mantai division of Mannar district; the rest of the Vavuniya district was attached to Mullaitivu district. As a result of integration of Negombo and Vavuniya districts into other districts there were twenty districts at the Census of population in 1901.

This district composition lasted until 1953, except for occassional boundary changes and a change of name,- the Mullaitivu district was renamed Vavuniya when the Head Quarters of the distr- ict administration was moved from Mullaitivu AGA Division to Vavuniya AGA Division in 1930s. But in 1 October 1953 Polonnaruwa district was created by elevating the Thamankadewa AGA Division of the Anuradhapura district to district status. At the same time Chilaw and Puttalam were integrated into one district. In 1959, Moneragala district was created by carving out Wellawaya, Buttala and Wellassa Division, from Badulla district of Uva Province, The district of Ampara was established on 10 April 1961 by amalgamating Korale Pattu, Eravur Pattu, Manmunai Pattu North, Part of Bintenna (G.S. Division 146) Pattu, Eruvil Porathivu and Manumai South, Karawahu and Nittavar Pattu taken from Batticaloa district. These changes had resulted in twenty two districts at the time of the 1963 census of population, and they remained unchanged until the 1971 census.

Changes in the Intercensal Period 1971 - 1981

All changes in the administrative districts effected in the intercensal period 1971 - 81 are listed below.

In September 1978 two new districts Gampaha and Mullaitivu were created. Gam- paha was carved out from Colombo district by taking its AGA Divisions North of the Kelani River. These included Negombo, Minuwangoda, Wattala, Diulapitiya, Meerigama, Gamapaha, Attanagalla, Weke, Mahara, Ja-Ela and Kelaniya AGA Divisions. Maritime Pattu and Puthukudyiruppu Assistant Government Agent Division of Vavuniya district, Manthai East Assistant Govt. Agent Division of Mannar District and part of Thunnukkai Assistant Govt. Agent Division from Jaffna District were amalgamated to create Mullaitivu district. With the addition of Gampaha and Mullaitivu to the list of districts, there were 24 districts at the time of the 1981 census.

Besides the creation of two new districts, boundries of several other districts namely, Kandy, Nuwara Eliya, Moneragala, Ampara, Anuradhapura and Trincomalee, were changed as follows.

(1) Udahewaheta AGA Division was transfered from Nuwara Eliya district to Kandy district with effect from 11 January 1979, but it was returned to Nuwara Eliya district with effect from 22 September 1980.

(2) Bintenna Pattuwa North and Bintenna Pattuwa South AGA Divisions were detached from Ampara district and attached to Moneragala district with effect from 10 April 1961, but they were returned to Ampara with effect from 1.3.1977.

(3) Tennamarawadi (No. 31 E) and Pulmuddai (No.31 G) Gramasevaka Divisions of Ku- chchaweli AGA Division and Paranamedavachchiya (No.31 F) Gramasevaka Division of Gomarasankadawala AGA Division were detached from Trincomalee district and attached to Padaviya AGA Division of Anuradhapura district with effect from August 1972.

(4) Padavi Sripura (No. 31 D), Tennamarawadi (No. 31 E) Parenamadavachchiya (No. 31 F) and Pulmuddai (No. 31 G) Gramasewaka Divisions of Padaviya AGA Division were detached from Anuradhapura district and attached to Trincomalee district with effect from 13 May 1982.

The hierarchy of administrative sub-divisions within districts are the Assistant Government Agent (A.G.A.) Divisions, Gramasewaka (G.S) Divisions and villages. The urban areas falling within these districts form separate administrative units.

At the 1981 Census in the 24 districts of the country there were 245 A.G.A. Divisions, 4,113 G.S. Divisions, 25,451 villages, 12 Municipal Councils, 39 Urban Councils and 83 Town Councils. The numbers of these divisions within districts are given in Table 2.2.

Table 2.2. DISTRIBUTION OF A.G.A.DIVISIONS, G.S. DIVISIONS, AND
URBAN AREAS BY DISTRICTS, 1981

District	A.G.A. Div.	G.S. Div.	Villages	M.C.	U.C.	T.C.
Colombo	8	121	188	2	4	6
Gampaha	13	389	836	1	6	9
Kalutara	10	230	630	–	4	6
Kandy	16	430	1998	1	4	2
Matale	10	170	881	1	–	3
Nuwara-Eliya	4	98	648	1	2	1
Galle	16	274	1445	1	1	7
Matara	11	214	690	–	2	2
Hambantota	8	165	1014	–	2	4
Jaffna	16	150	551	1	3	9
Mannar	4	33	581	–	–	1
Vavuniya	4	23	579	–	1	–
Mullaitivu	4	26	297	–	–	1
Batticaloa	7	87	667	1	–	2
Ampara	12	108	467	–	1	2
Trincomalee	9	48	374	–	1	3
Kurunegala	17	510	4141	1	1	3
Puttalam	10	178	1001	–	2	5
Anuradhapura	16	189	3402	–	1	1
Polonnaruwa	5	60	381	–	–	2
Badulla	14	151	1126	1	2	4
Moneragala	8	88	873	–	–	1
Ratnapura	13	175	1586	1	1	3
Kegalle	10	196	1097	–	1	6
Total	245	4113	25453	12	39	83

STATISTICAL DATA PROCESSING AND
THE POPULATION DATA BASE OF SRI LANKA

by
R. B. M. Korale

STATISTICAL DATA PROCESSING AND
THE POPULATION DATA BASE OF SRI LANKA

Introduction

The Department of Census and Statistics (DCS) is the central government agency which is responsible for the collection, compilation, analysis, and dissemination of statistical data and information requirements of the government. The DCS is also charged with the functions of providing trained professional staff to all government agencies, undertaking statistical services and for establishing statistical standards and for the co-ordination of statistical activities and it thus serves as a focal point and performs the services of a central statistical organisation.

The DCS was established in 1947 and initially functioned under the Ministry of Finance and was assigned to the Ministry of Planning and Economic Affairs in 1970 which was under the Prime Minister. Since the establishment of the Executive Presidential form of government in 1978 the Department has been functioning under the President as a Department assigned to the Ministry of Plan Implementation, except for a brief period in March - April 1988 when a separate Minister of Plan Implementation was appointed.

Subjects and Functions

The DCS functions as the central statistical agency of the government and it is responsible for conducting censuses of all socio-economic subjects including population, housing, industry, agriculture etc. The Census Ordinance (which was first enacted in 1868) and its amendments provides for the conduct of regular censuses on socio-economic subjects as determined by the Minister in charge of the Department with the Director functioning as the Superintendent of Census. The DCS also has legal authority under the Census Ordinance and Statistics Ordinance of 1935 to collect data from individuals and firms relating to personal and economic matters guaranteeing confidentiality to the respondents.

In terms of a policy decision taken by the government in 1951 the DCS is required to service all government ministries and departments by recruiting and placing professional statistical staff required by them to undertake statistical programmes to meet their information needs.

Responsibilities

There are several activities which were entrusted to the DCS from its inception. The scope of these activities have increased over time. These activities include the conduct of censuses on socio-economic subjects, undertaking of national household and sectoral surveys, surveys of industrial establishments, collection of data on subjects such as wages and prices and preparation of reports of surveys and analytical reports providing statistical

data and information to meet the needs of planning and policy review. The legal authority vested in the Department and its location within an apex ministry has enabled the DCS to successfully undertake decennial series of censuses of population, housing, agriculture, industry and national household survey programmes achieving very high rates of response in these statistical inquiries. It also designs and carries out surveys to meet the data needs of other government sector organizations. The Department has also conducted several surveys in collaboration with a number of international agencies.

Apart from provision of processed statistical data to users the DCS has been assigned responsibilities in 3 - 4 other areas, recently. One such area is the provision of user oriented outputs, such as the construction of forecasts and projections, construction and upgrading of socio-economic indicators, undertaking of special analytical studies and research. The paucity of demographers, econometricians and quantitative economists in planning and administrative positions have made it necessary for the DCS to undertake these activities. The organisation and design of these studies require trained and experienced staff at high level with special skills, who are now in short supply in the DCS. Another such area is the advisory services on statistical subjects and this is important from the point of view of statistical co-ordination. The technical divisions are called upon frequently to help both governmental and non-governmental organisations on survey design and sampling. In the case of government ministries and departments having DCS staff the Department is called upon to advise them on questionnaire design, survey taking, data processing and related matters. One of the most important responsibilities that has devolved on the DCS is the provision of assistance in data processing.

The DCS acquired computer capability at the end of the 1960s and was one of first institutions to do so. Consequently DCS has been called upon to process records for a number of organisations of the government. The organisations which utilized the data processing facilities include the Treasury, the Registrar-General, Customs Department, Labour Department, Police Department etc. The Data Processing Division which takes care of all processing jobs of the DCS including nation-wide censuses and surveys and in addition when it has to provide services to a number of Ministries and Departments and other institutions require a very strong capability by way of hardware and trained and experienced programming staff. The proposed computerisation of field officers of the Department would also cast additional responsibilities on the Data Processing Division of providing necessary assistance to ensure the proper functioning of Data Processing Units at these field offices, specially during the early phases of Project implementation.

Organisation

The DCS is located as a Department within the Ministry of Plan Implementation. The chief executive officer of the Ministry is the Secretary, Ministry of Plan Implementation. The DCS is administered by a Director and its organised with centrally located subject matter divisions and service divisions with branch offices in Ministries and Depart-

ments and field offices at sub-national level. The total staff cadre of the Department amounts to 1212 employees in all grades. A breakdown of the staff by post and level is given below:

TABLE 1

Staff by January 1988 -

Director	01
Additional Director	01
Deputy Directors	04
Assistant Directors	11
Statisticians	46
Statistical Officers	128
Statistical Investigators	446
Analyst Programmers	20
Computer Operators	12
Data Entry Operators	73
Clerical/Stenographers/Typists	188
Other Staff	282
TOTAL	1212

Subject Matter of Technical Divisions

Technical Divisions have been established at Head Quarters to cater to the following subjects and functions:

(1) Agriculture Statistics
(2) Data Processing
(3) Demography and Research
(4) National Accounts and Prices
(5) Population and Housing Censuses
(6) Sample Surveys
(7) Statistical Field Operations
(8) Statistical Standards and Co-ordination
(9) Statistical Training
(10) Trade and Industry Statistics

An Assistant Director is responsible for the administration of a technical division and some of the larger technical divisions such as Sample Surveys, Population and Housing Censuses, Agriculture Statistics, National Accounts and Prices, Trade and Industry have 3 - 4 trained Statisticians, 5 - 6 Statistical Officers, and support staff, num-

bering 40 - 50 officers and employees. In addition to these technical divisions there are service divisions and Units for Administration, Accounts, Printing, Publications and Library Services.

Field Offices

The country is currently divided into 9 provinces and they are further sub-divided into 25 districts. The districts are divided into 268 Assistant Government Agent's Divisions. The DCS has a field organisation with statistical offices attached to the Kachcheries (District Secretariats) and it also reaches the 268 AGA Divisions to which the country is divided through a Statistical Investigator attached to each Divisional Office. The main functions of the statistical field organisation are to provide the statistical data and information needs of institutions and organisations functioning in their areas and to assist the head quarter technical divisions in the design collection and compilation of current data on socio-economic conditions of the population.

The district statistical offices are small and they have remained in the present form for more than 2 decades. They are headed by a sub-professional level officer. The need to upgrade this post and restructure these offices has been accepted. The decentralisation of planning functions through the establishment of district planning offices and undertaking of regional development programmes and several sectoral programmes have increased the statistical information provision responsibilities of these offices. The demand for statistical information is expected to increase substantially with the proposed devolution of political authority and the establishment of Provincial Councils. In order to meet these increasing responsibilities, upgrading of staff at this level and the provision of micro computers to improve the data processing capability of these sub-national level offices were accepted as important aspects of statistical development programmes. Strengthening of these statistical offices by installing micro computers is a major component of the Population Information Project financed by Japan International Co-operation Agency (JICA) and is being undertaken under a phased programme.

Statistical Offices in Ministries and Departments

Government Ministries and Departments which require professional staff in the field of statistics are required to have their cadre created under the DCS, and these Statistical Offices in Ministries and Departments are provided with centrally recruited professional staff by DCS. It is the responsibility of the DCS to supply staff trained in the required specialisation having the requisite experience to man these offices. About 50 Government Ministries and Departments including Agriculture, Industry, Health, Education, Finance and Planning, Customs, Police, Prisons, Social Services, Forests, Land, etc. are provided with statistical staff of the DCS. Apart from the very wide variation in the subject specialisations needed to service their needs, the level and quality of work has become sophisticated in many of them. The officers posted to these departments should

be able to meet with the backgrounds and experience necessary to design statistical documentation, and collect, extract, edit, process and supply information needed by these organisations.

One broad area in which the statistical staff attached to these offices should acquire skills is in the use of micro computers and statistical computing. Some of these Ministries and Departments have already acquired computers and therefore there is some urgency in the provision of data processing skills to the statistical staff. A request for assistance to programme this training under the Population Information Project has been favourably reviewed and recommended by the JICA Review Mission April, 1988. Its proposed to commence this training from the second half of this year.

Statistical Data Processing
Data Processing Division

The Data Processing Manager is responsible for the administration of this Division. He is assisted by 3 Analyst/Programmers Grade I in the supervision of systems development and programming. The system design and programming work devolves directly on the Analyst/Programmers Grade III and Grade II in which the approved cadre is 17. Computer operation work is in charge of a Systems Operations Assistant and he is assisted by 4 Systems Controllers and 12 Systems Operators. There are 5 Assistant Data Controllers to supervise the work of Data Entry staff which has a cadre of 73. The custody of computer material is in charge of a Tape Librarian. The Data Processing Manager is assisted by the Officer-in-Charge who attends to the administrative and clerical work. The Division also has the services of a Expert in computer programming work in the Population Information Project financed under the Japanese Government Technical Assistant Programme. The Expert is concerned with the supervision of the installing of IBM 9337 main frame and peripherals and systems design for the Population Data Base. He will also be directly involved in training both counterpart staff, and sub-national level officers in Data Processing. The total strength of Data Processing Division is 135.

Data Processing Activities

The DCS acquired its electronic data processing equipment in 1970. Since then data for all large scale censuses and survey operations undertaken by the Department were computer processed by the Data Processing Division. The major statistical jobs undertaken in the 1970s included the Census of Population and Housing 1971 and the Agriculture Census 1973. A number of medium sized surveys were also conducted by the DCS during the 1970s, the Socio-Economic Survey 1969/70, the Sri Lanka Fertility Survey 1975, Survey of Manufacturing Industries (annual), Paddy Crop Estimation Survey (half yearly), Determinants of Changes in Fertility in Sri Lanka 1979 sponsored by the World Bank, etc., all of which were processed by the Data Processing Division. Except for some small case studies where computerization of data was not essential all other statistical survey data undertaken by the Department have been computer processed.

The Data Processing Division has serviced all the technical divisions of the DCS which are responsible for carrying out statistical surveys and studies. An annual survey programme has been established under the National Household Survey Capability Programme and the first survey was conducted in 1980/81. The sample size of this survey was increased to 25,000 in 1984. Several demographic and fertility surveys were also undertaken after 1982 with technical assistance from foreign donor agencies. In addition to the Population and Housing Census 1981, the Agriculture Census 1982, and the Census of Manufacturing Industries 1983/84 were conducted. The sample size of the Annual Survey of Manufacturing Industries was also increased to 5,000 establishments. In addition to these, several ad-hoc surveys and studies have also been undertaken during the past years. Thus there has been a substantial increase in the volume of work that devolved on this Division, since the beginning of the 1980s.

The DCS was the first government sector organization to acquire Electronic Data Processing (EDP) capability by installing its first computer in 1970. A number of state sector institutions have sought and utilized the data processing facilities of the DCS. In addition to ad-hoc users who made requests off and on, regular EDP services were provided to the following organizations for the undermentioned work:

	Organization	Period	Activity
1.	General Treasury	1971 - 1986	Government Accounts.
2.	Registrar-General	1970 to date	Births, Deaths, Marriages Statistics.
3.	Customs Department	1974 to date	Import and Export Commodity Information.
4.	Department of Labour	1971 to date	Employment, Earnings and Hours Surveys.
5.	Police Department	1977 to date	Road Accident Statistics.
6.	Ministry of Plan Implementation	1978 - 1983	Employment Data Bank (Job Bank) Scheme.
7.	Ceylon Government Railway	1974 - 1980	Passenger Statistics.
8.	Inland Revenue	1973 - 1979	Taxation Statistics.

Some of these users have paid for the services rendered, however these funds are not available for utilization by the Department as they have to be credited to revenue.

The undertaking of these regular services specially when large jobs, such as processing of census data are in hand have severely strained staff and resources of the Division. The Division lacked adequate hardware capability and adequate cadres to process large jobs such as censuses without having to spread the time duration making it difficult to produce timely data. In this situation it was not unusual to spread the data entry and processing work from censuses over periods as long as 3 - 4 years.

Processing Census 1981

The Census of Population and Housing 1981 was taken on 17th March 1981, the completed census schedules were received from the 24 districts at Head Office. Processing of schedules was carried out in 2 stages with manual editing and coding being done at the Census Division and computer processing in the Data Processing Division. Manual editing procedures adopted had been developed to ensure that -

(1) Area identification codes were recorded and corrected.

(2) Age was recorded and if not an age was imputed.

(3) District of birth and district of previous residence was coded by the enumerator.

Office coding had been kept to a minimum in the development of the schedule except for 3 questions on educational attainment, occupation and industry, the others had been pre-coded or self coded. For the coding of these questions a staff of 50 editor-coders had been recruited and trained and their work had been supervised by Statistical Officers under the directions of a Senior Statistician. Initially the codes had been subject to a 100% verification but after the error rates had declined, verification had been brought down first to 10% and eventually to 1% sample of the coded schedules.

The edited and coded schedules were transferred to the Data Processing Division for computer processing. The data processing plans had recognized the limitations in capacity and late acquisition of equipment as having prevented the development of and finalizing of data entry and tabulation programmes, and therefore the need to publish a series of reports based on a 10% sample. The IBM System 34 with 14 Data Entry Terminals and 24 IBM 5280 Data Entry Stations which replaced 20 Card Punching Machines and 19 Card Verifiers, had been used for data entry work. The data from these two sources were transferred to a magnetic tape File in the IBM 4331. The system design had provided for a number of edits including consistency checks and imputation of missing values. Computer editing included range and validity checks, and consistency checks using intra record and inter record data at household level. The imputation of items was restricted to selected fields. Three edit programmes have been used to provide for the editing of urban and rural records separately. Data editing was done by A.G.A. division. The edit checks have provided for the records containing errors to be printed for manual correction. The records had been corrected manually checking against the original schedules wherever necessary. The corrected records had been re-entered and verified against the edit checks up to a maximum of

three times. Manually corrected error records were updated with the entire error free file to avoid duplication. To process the tabulations 6 sub-master files have been created.

The release of the 10% sample commenced in mid 1982. The processing of all the schedules were completed only towards the end of 1984 and a number of district reports based on the census were produced from then onwards and the final report of the Census was released in 1986.

Future Plans

Considering the increased volume of data processing work that has devolved on the Department as a result of regular survey programmes and the experience of the 1980 series of censuses which had caused long delays in releasing of data, upgrading of data processing facility was identified as a priority area of highest importance in statistical development programmes. By this time several Technical Assistance Missions had also highlighted this need. The inadequacy of data processing capacity had also prevented the DCS from fully utilizing the data generated through its censuses and survey programmes. This limitation particularly applies to population information which had been gathered through a decennial series of censuses, vital registration statistics and from a number of fertility and demographic surveys conducted by the Department.

A Japanese Government Technical Assistance Mission in 1986 was appraised of this position and they agreed to send a team to conduct a feasibility study. The Japan International Cooperation Agency (JICA) sponsored a Mission in March 1987 which evaluated the data processing needs of establishing a population data base. In evaluating the capacity, the requirements for the various operations including the census programmes of the 1990s was taken into account. The configuration described at Page 12 with IBM 9377 Main Frame Computer with 8MB Memory and 16 MB Virtual Storage and peripherals including 5 Disk Drives having a capacity of 4000 MB, 2 Fast Tape Drives and 20 Terminals were recommended. The implementation of the Population Information Project commenced in November 1987. A JICA review Mission reviewed the Project in April 1988 and has recommended further strengthening of the Project by increasing the disk storage to 8 units having 6400 MB to cater to the anticipated additional needs for creating a village level population data base. The capacity of the main processor and the disk storage provided would be adequate to meet the needs of the 1991 Series of Censuses.

The equipment required for inputting the 1990 Census of Population data was also evaluated, and according to assessments made approximately 120 terminals will be required to enter, verify and edit the data over a 10 month period in a two shift operation. Provision for a building to house the census schedules which will be received at the head office and to code and edit them and to instal the 120 data entry stations is planned for construction in 1989 and is included in the Government Budget. The work on the

designing of the Census 1991 schedules has already commenced and Analyst/Programmers have been associated from the inception. The testing of questionnaires is scheduled for 1989. Systems design and preparation of data entry, edit and imputation programmes and tabulation programmes will be started when the design of the questionnaire reaches a degree of finality. The responses of users for inclusion of topics is still being received and it is expected that the draft schedule would be finalized by the end of the year. In order to avoid the delays in the release of data which has been a feature in some of the past censuses, acquisition and installing of equipment, and data processing plans will be finalised well ahead of the census scheduled for March 1991.

Computerising Regional Statistical Offices

The computerisation of district statistical offices was planned with a view to meeting the rapidly increasing information needs at district level. It is proposed to provide district statistical offices with data files relating to the respective districts so that information relating to sub-national level statistics particularly tabulations relating to population and other socio-economic subjects on which data is available can be produced on request. The provision of micro-computers for this purpose has been included in the Population Information Project. The installing of these micro computers will be undertaken under a phased programme.

In the first phase statistical offices in provincial towns will be provided with micro computers. The equipment would consist of -

IBM PS 2 Model 80

1 MB Micro-Computer

Printer

Plotter, where necessary for graphical presentation of data. Standard statistical packages such as Data Base III and SPSS will be provided. The staff has already been selected for 2 districts, Ratnapura and Gampaha, and they are undergoing training. The micro-computers will be installed shortly when staff training is concluded in June 1988. Under the Population Information Project micro-computers are expected to be installed in about 18 of the 25 districts before March 1990.

Data Processing Technology

At the time the Department of Census and Statistics was established in 1947, the census taking operations of the Census of Population and Housing 1946 had just been concluded and the machines that were acquired for tabulating the data were available to the new Department. It was at this Census that machines were used for the first time in Sri Lanka to process census results. These tabulating machines formed the nucleous of the Machine Section of the Department. The mechanical punching, verifying, sorting and tabulating equipment acquired for the Census 1946 were used for processing the Census of Population and Housing 1953 data too. These machines were upgraded for the 1963 census operations. The machines installed in 1963 consisted of the following.

IBM Model 101 Statistical Machine
IBM Model 402 Accounting Machine
IBM Model 029 Punching Machines (20)
IBM Model 029 Verifiers (20)
IBM Model 082 Sorters (2) - (One with a Counter)
IBM Model 514 Reproducer

The Machine Section at the time was in charge of a Statistician. This equipment was used in processing the data from the Census of Population and Housing, 1963. It is worthwhile to note here that the data from this Census was not processed fully and only 2 reports based on 10% sample tabulations were released at the time.

The introduction of electronic computers to process the data from the Census of Population and Housing 1971 was decided upon and the Department acquired its first Electronic Computer in 1970. This configuration consisted of the following:

IBM 360 Model 25 Central Processor 24 KB

Capacity was increased to 48 KB in 1972

2 Tape Drives Model Nos.

IBM Model No. 2415 Tape Drives (2 Nos.)
IBM Model No. 2415 Tape Drives (2 Nos.)
IBM Model No. 2311 Disk Drives (2 Nos.)
IBM Model No. 024 Punchers (20 Nos.)
IBM Model No. 056 Verifiers (19 Nos.)
IBM Model No. 2501 Card Reader (1 No.)
IBM Model No. 082 Sorter (2 Nos.)
IBM Model No. 1403 Liner Printers (1 No.)
Software Operating System TOS/DOS

The delayed acquisition of this equipment and the capacity of the machines had resulted in nearly 3 years being taken to process the data. The Final Report of the Census was released in 1977, 5 1/2 years after census taking. The inadequate capacity of the machines was recognised and the Department sought support to upgrade the data processing capability. UNDP/UNFPA technical assistance was obtained and the configuration listed below was acquired in 1980:

System 4331

| Central Processing Unit | 4331-101 | 512 K bytes main memory |
| | | Disket 1/0 |

Disk Drives	3310-A02	129 mega bytes
	3310-B02	128 mega bytes
Tape Drives (2)	8809-A02/002	1,600 bpi, 9 track
Line Printers	3203-005	1,200 lines per minute
	3262-001	650 lines per minute
Card Reader	3505-B01	800 cards per minute
Data Entry Keyboards (8)	3278-002	
Typewriter Keyboards (2)	3278-002	
System Console	3278-A02	

System/34

System Unit	5340-E23	128 K bytes main memory 27 mega bytes disk storage
Display Stations	5251 (2 sets)	
	5252 (Dual, 7 sets)	
Line Printers	3262-B01	650 lines per minute
Data Entry Stations (24)	5280	Commencing 1982.

This equipment was installed towards the end of 1980 just prior to the census taking operations scheduled for March 1981. The delay in acquiring and installing of this equipment prevented the finalising of design of system and programmes in time for the census. The undertaking of designing and programming work after the census taking operation and the capacity of the equipment which was inadequate to meet demands of data entry and verification operations led to the Population Census work being merged with the work connected with the Census of Agriculture - 1982, Census of Manufacturing - 1983 causing long delays in producing Census of Population and Housing data.

The upgrading of the data processing capability of the DCS is being implemented under the Population Information Project financed by JICA under the Japanese Government Technical Assistance Programme. As the current configuration consists of IBM equipment and the programmes and files have been designed to run on this equipment, JICA agreed to the request made by the DCS to provide IBM equipment of adequate capacity to meet the needs of the Population Information Project and the census programmes of the 1990s.

The configuration now being installed consists of the following equipment and software:

CPU IBM 9377 Model 90 8 MB Main Memory
Disk Drives (5 Units) Model 9335 855 MB each
Tape Drives (2) Model 3422 6250 bpi 9 track
Line Printer Model 4245-020 2000 lines per minute
System Console PS 2 Model/30
Display Terminals (4) Model 3191

Software

Operating System:	VSE
	VN
Data Base Software	SQL and CSP
Telcommunication	ACF/VTAM
Personal Computer (3)	PS2 Model 60 1 MB
	40 MB Hard Disk

In order to reduce the time lag in survey taking and release of data and also to reduce the burden on the Data Processing Division when undertaking ad hoc surveys and studies which caused delays on routine activities, and also to provide the subject matter staff with the opportunity of analysing the data base compiled through the censuses and surveys, a programme of providing micro-computers to the specialized divisions of the Department was initiated. Since 1985, a few micro-computers were procured from both bi-lateral and multi-lateral sources. This programme of providing micro-computers for the subject matter divisions is continuing. In addition under the Population Information Project provision has been made to supply micro-computers to the District Statistical Offices. The configuration for district offices would consist of -

IBM PS 2 Model 80 1 MB
Printer and
Plotter for graphical work where necessary.

The Population Information Project would have 16 micro-computers by mid 1989 for use at the Centre and in the districts. The number, type and make of equipment now installed is described below:-

Year	Model	No. of Units	Location	Supplier/ Donor
1986	IBM PC XT	1	Sample Survey Division	USAID
1986	IBM PC XT	1	Population Census Division	USAID

Year	Model	No. of Units	Location	Supplier/ Donor
1987	IBM PS AT 2 Model 30	1	Agriculture Division	FAO
1987	IBM PS 2 Model 50	1	- do -	FAO
1987	IBM PC AT	1	Population Census Divison	Westinghouse
1988	IBM PS2 Model 60	2	Data Processing Division	JICA
1988	IBM PS2 Model 60	1	Head Quarters	JICA
1988	IBM PS2 Model 60	1	Population Census Division	JICA
1988	IBM PS2 Model 60	2	Training Division	JICA

Internal Procedures

The DCS uses field staff of the Department attached to the districts and divisions to collect data for the censuses and surveys it undertakes. The census programmes require a very large staff apart from these cadres, and village level government officers are recruited as enumerators for data collection. The Census of Population and Housing 1981 required 66,000 enumerators and supervisors to conduct the census. Except in instances where specialized staff are required, such as in the case of health surveys, survey work is carried out by departmental staff. Generally field staff are brought to Head Office and provided with intensive training on administering the schedules before the survey is undertaken.

Checking of schedules for completeness and some manual editing of questionnaires are undertaken in the district offices of the Department. Manual coding and manual editing of schedules are undertaken by the specialized division responsible for the survey. The schedules are then transferred to the Data Processing Division for keying. Edit specifications are prepared by the subject matter staff and provided to the Data Processing Division. The computer editing and cleaning of data including the preparation of edit programmes, data entry programmes and tabulation programmes are the responsibilities of the Data Processing Division. In some of the recent surveys it was usual to adopt 'hot deck' methods of editing for imputation.

The application programmes for undertaking the editing, verification, imputation, data entry and tabulation are responsibilities devolving on programming staff of the Data Processing Division. The application programmes for these functions are generally

designed and written by them. The data processing staff have shown a preference for designing the system and writing their own programmes for the surveys rather than depend on packages available. Thus not many application software had been used by them. The software in use are CENTS, CONCOR and SPSS.

Report Preparation

The preparation of tabulations in printable format is undertaken by the Data Processing Division. Thus nearly all the tabulations that are prepared for printing are developed in this format. The Data Processing Division does not possess a letter quality printer, it is therefore necessary for the Printing Division to provide the table heading and use the text of the tables in printing of the report. Preparation of survey or analytical reports is the responsibility of the subject matter divisions. The services of the Data Processing Division which is housed separately have not been utilized for this work so far. However, the subject matter divisions such as the Census of Population Division and the Agriculture Division which have acquired word processing equipment are beginning to use the word processor for report preparation. So far maps and graphics have been prepared mainly by the Cartography Unit using manual techniques. This work will be undertaken shortly on micro-computers under the Population Information Project. The Data Processing Division will also be receiving a page printer in 1989 under the Population Information Project and it is proposed to produce some of the texts required to print publications such as the Statistical Pocket Book and Statistical Abstract directly using this equipment.

Human Resources Development

Staffing

The data processing staff of the Department undertakes the processing jobs of the DCS, and provides services to other users. The staff of the Data Processing Division has been decided more by way of availability of hardware than on the basis of cadres required for processing the statistical work of the DCS and the work of other departments. Before the acquisition of the Main Frame IBM 4331 in 1980 the staff of the Division was strengthened to undertake the 1980 Series of Censuses. Several officers in middle level positions were provided with training abroad and others were provided with short inservice training programmes. The configuration used specially the data entry systems available both on-line and off-line fell far short of the requirements of producing timely output from the three censuses population, agriculture and industry undertaken at the beginning of the 1980s. The work of these censuses and other on-going programmes having to be undertaken simultaneously caused delays in all jobs and output. These delays on input and output were mainly because of an inadequate availability of hardware which reduced pressure on meeting programming job schedules and consequently on the need to increase staff cadre. Systems design and preparation of programmes including those in respect of major jobs have been undertaken by the DCS staff. The assistance of 2 UNDP Experts and a few short-term Advisers on an ad hoc basis have been available to the staff.

Considering the increased activities that have devolved on the Division in the recent past the number of Analyst/Programmers Grade III was increased by 5 posts from the beginning of 1987. By way of pure numbers the current approved cadre is adequate to undertake the present activities according to schedules established by hardware capacity, etc. However, an allowance has to be made for staff training and development as officers are not generally available for extended periods of time. Further because of high turnover the current strength is inadequate. It is necessary to set apart as much as 25% - 30% of the cadre as being unavailable for active work at recruitment and training stages.

The primary issue the Department faces is retention of data processing staff arising poor pay scales applicable to these grades and the availability of more attractive positions within and outside the public sector because of the rapid expansion in the use of computers. The installation of the new IBM 9377 System and peripherals has made it necessary to evaluate staff requirements. A study undertaken shows that it will be necessary to install around 120 data entry stations to undertake the Census of Population and Housing scheduled for 1991, to enter the data within 10 months in a 2 shift operation. This means that the total number of data entry stations that should be available to meet the requirements of the census programme and other routine work would be around 160. The data entry staff, supervisory personnel and the computer operational staff have to be substantially strengthened in time for the census scheduled for March 1991. Of these certain categories of personnel such as the Data Entry staff would be recruited about 4 months prior to the scheduled date of the Census and computer operating and supervisory staff will have to be appointed some-what earlier. The present staff can be upgraded into the latter positions by providing them with suitable training and orientation.

Staff Development Policy

Until now the Data Processing Division which is housed separately has been responsible for all aspects of work from the stage of data entry to the provision of computer processed tabulations. The DCS had a IBM 4331 Main Frame Computer and a IBM System 34 Mini Computer. The first micro-computer was acquired only in 1986. Currently it has about 10 IBM Personal Computers of PCXT, PCAT and PS 2, models located in several technical divisions. The absence of micro-computers did not create an immediate need to provide training in the use of micro-computers to the subject matter statistical staff. With the acquisition of this equipment the need to quickly have a cadre of Statisticians trained in micro-computer has become a matter of priority.

The decision to computerise the regional offices of the DCS by provision of micro-computers has also heightened the need to produce a cadre of Statisticians and sub-professional level officers competent in the use of micro-computers. It is not intended to provide Analyst/Programmers to the District Statistical Offices at least in the first phase of programme implementation. Therefore the main thrust will be to train personnel in Statistician, Statistical Officer and Statistical Investigator grades in the use of micro-

computers and software packages so that they could utilize the census and statistical data copied to them by the Data Processing Division and in using the data sets they themselves generate at sub-national level to provide estimates and projections, of population and population related variables in the early phase of their work. The DCS has already made arrangements to provide this training.

A course of training was organized in January - February 1988 with the use of local consultants, and middle level staff in the data processing and Technical Divisions were provided with training. Short training programmes have already been organized utilizing the facilities available with the vendors. A JICA Review Mission for the Population Information Project has favourably evaluated a request for local training under a 2 year phased programme. Utilising the JICA Expert staff and the few who are already trained on this subject, its proposed to organise a regular training programme to cater to both the staff in the specialized divisions and those attached to field offices. Initially the courses will be of about 3 - 4 weeks duration.

The DCS recognises the need to obtain the services of bi-lateral and other sources to procure trainers in this field to run short programmes of 3-6 weeks duration to upgrade the skills of the staff. A short programme was conducted in collaboration with SIAP, Tokyo in September - October 1987 to train the staff in the use of micro-computers and this made it possible to provide training to about 20 officers of the Department. Assistance of other donors will be sought to organize similar programmes of short duration. The DCS also expects to utilise short courses of training offered by bi-lateral and multi-lateral sources, such as the training courses offered by SIAP, Regional Training Centre, New Delhi and the Okinawa International Centre, Okinawa, Japan to train these personnel.

Training Facilities

Facilities available for training in data processing has substantially increased during the past 5 - 8 years with the growth in the use of computers and the number of institutions providing training in the use of micro-computers has increased. This training is offered mainly by vendors and firms engaged in commercial data processing work. The courses offered by the private sector are mainly of short duration of 3 weeks to 3 months and training is basically at introductory level. The acquisition of computers by the Universities and the strengthening of computer facilities in Universities which had acquired this equipment earlier had made it possible for the students following courses in Statistics, Physical Science and Social Science programmes to receive instruction and acquire basic skills in computer programming. The recent recruits to the Department to the Statistical and Analyst/Programmer grades have had the advantage of this background.

The social demand for training has also increased rapidly buttressed by opportunities available locally and in foreign employment. The rupee value of computer equipment and the pressure for training placements in an expanding field with opportu-

nities in the Middle-East and the difficulties of raising training courses fees have resulted in short courses where hands on computer time remains still very limited.

The National Institute of Business Management has been conducting a 1 year Diploma in Computer Design and a six months Certificate Course in Design and Development of Computer Systems. The University of Colombo, Department of Statistics and Computer Science has introduced a Post-Graduate Diploma in Computer Applications, a Certificate Course in BASIC and a Certificate Course in Scientific Application for FORTRAN. At the commencement of the Post-Graduate Diploma programme, 4 officers of the Data Processing Division were released to follow the Course.

The University of Colombo has now established an Institute of Computer Technology and the buildings and facilities of the Institute are now being constructed. The DCS would benefit mainly from the courses offered by the University of Colombo. It would be necessary to recruit and retain good teaching staff to conduct these programmes. The University has met with staff shortages in these subjects and other disciplines because of high staff mobility, and student unrest prevailing in Universities has also prevented better use of these facilities.

The DCS will have to obtain a few placements for some more time to train its key data processing personnel in systems design and computer applications in good courses offered by training institutions, such as the US Bureau of Census, ISPC, and the Okinawa International Center, Japan. The DCS would also need the services of a few short-term Consultants towards the final stages of the 3 censuses scheduled from 1991 to 1994 to obtain their advise on census data processing. These Consultants can be used to offer short in-service training programmes in the Departmental Training Centre to upgrade Data Processing and Subject Matter staff.

Current Status of Storage and Retrieval of Data

Sri Lanka has compiled a relatively good data base on population and population related variables through its decennial census programmes and the system of vital registration administered in the country. Regular decennial censuses have been undertaken since 1871 and the 12th Census of Population was taken in 1981. Published data on demographic characteristics of the population are available in the Census Reports from 1871. They provide fairly detailed statistics on age, sex, marital status, ethnic group, religion, literacy, industry, principal occupation, migration, housing, etc. This data cross classified by sub-national areas is available from nearly all the censuses. The data from the Census of Population and Housing 1971 and Census of Population and Housing 1981 were computerised and data relating to individual records are available on magnetic tape. Thus any type of cross tabulation of the information elicited through these two censuses can be extracted.

The registration of vital births and deaths was introduced in 1867 and the registration of births, deaths and marriages Ordinance which has been amended as occasion demanded have provided a fairly complete system of registration of births and deaths. These statistics have been published in the Report of the Registrar-General with a fair degree of detail. These reports are available for over 100 years. The vital registration data have been computerised by the DCS and records relating to births, deaths and marriages for the period after 1970 are also available on magnetic tape. The DCS has also conducted several surveys since 1969 to measure demographic aspects and fertility and these data files are also available on tape. The DCS has in its computer data files, data on all surveys conducted by the DCS after 1971. These include the Agriculture Censuses of 1972, and 1982; the Census of Manufacturing 1983; Annual Survey of Manufacturing (since 1979); Annual Paddy Crop Estimation Survey (since 1971); National Household Sample Surveys and other ad hoc surveys conducted by the Department. The retrieval of data from these data files is currently possible and the system that is now being installed will enable the reading and processing of these tape files.

Priority for Population Data

The demand for data that has emerged so far has been more for population data, presumably because of the demand having itself being determined by the supply of data. This demand has arisen primarily because of 2 factors. Firstly the emphasis given for population, family planning and fertility limitation programmes by the government during the past 2 to 3 decades, and the assistance given by international agencies to population programmes undertaken by government and non-governmental organizations. Thus priority for population related programmes have caused a demand for population information.

Secondly population break down by demographic variables is needed for most socio-economic plan formulation and project preparation activities and the information disaggregated by project and programme areas are frequently requested by planning organizations and line ministries. At the sub-national level too, the demand for data from district statistical offices have also been mainly for this information. Considering this demand for data the establishment of a population data bank was accepted for development under the JICA assisted Population Information Project. The Project which is of 3 years duration commenced in November 1987, and is scheduled for completion in October 1990.

Population Data Base

The principal object of the Population Data Base is to store and supply population and related information of general interest to government and public users. The data base that is being established provides for the storage in generalized formats of population and related statistical data collected in the decennial censuses, vital registration, demographic and socio-economic surveys and in establishment inquiries. The entire data base will

be held in direct access. In the preliminary stage only population and related data will be stored and this will be expanded to cover other subjects once the system becomes fully operational.

The data processing equipment required for establishing and operating the population data base has already been installed in the Data Processing Division of the DCS. At present test runs of the hardware and the operating systems are on-going. IBM 9377 main frame computer with 8 MB with 5 disk drives each with a capacity of 800 MB are available for the data base.

The direct access storage capacity will be further increased to 6400 MB by installing 3 additional disk drives by early 1989. According to preliminary evaluations the software of the operating system to run the computer and that of the data base would require around 1600 MB of disk space. Thus the balance installed disk drive capacity is available for population data files and processing.

At present two methods of structuring the population data base is under consideration and their merits and deficiencies in relation to the data files that are available are being examined. The data arrangement for the use of the cross section method whereby the table is broken down into cells and a unique code is attached to each record allowing the identification of the record in the file has certain advantages.

Firstly the volume of data is aggregated and space required is reduced and output also is suitable for analysis. However, it has been observed that the method will not be suitable for small area tabulation at the level of the village because quantity of data can then become too large. The data directory method of including identification information in a directory file and using the data file for processing is also being examined.

The data entry programmes would be designed to create new files, update existing files and also to provide for editing and correction to reduce errors being introduced into the data base. The software that will be used for data retrieval would be Structured Query Language (SQL). It is proposed to use the package Cross System Product (CSP) for screen making. The screen flow arrangement will allow for selection of source, classification, sub-national area, table, and retrieval and display of retrieved data.

Procedures will also be built into protect the data files and for house keeping operations. File protection is important as provision of direct access to external users is under consideration. In the first phase of the project tables from the Census of Population and Housing 1981 would be created. On completion of transfer of 1981 Census data incorporation of data from 1971 Census will be carried out. There are some difficulties of transferring this data as time series, due to changes in the boundaries of administrative areas and some changes in concepts and definitions, which need to be resolved. Data from other sources such as vital statistics will then be introduced.

As a matter of policy it has been decided that the data base should be capable of eventually accessing village level information. This will be achieved by retabulating individual census records in a second phase of the project towards the end of 1989 after having tested and evaluated the design and procedures for selected areas. When the system is fully developed it will provide data from a large base covering much more than the total output of published statistics on population and socio-economic survey data. The development of the full retrieval system could take time but it is anticipated that this could be achieved by the Project completion data of October 1990. The retrieval procedures that will be developed will allow the user to select the tables and series and also apply standard statistical techniques. on the retrieved data. The retrieval procedures will also provide for the printing of complete reports from the data base such as the statistical pocket books and statistical abstracts utilising the time series data that will be maintained in the data base.

The development of the Population Information Data Base has been organized as a Project of 3 years duration. The work on the Project formally commenced in November 1987. Japan International Cooperation Agency is financing the Project under the Japanese Government Technical Assistance Programme. Two Experts, an Expert in Demography and an Expert in Computer Programming are working on this Project since February, 1988. The selection of data for input will be largely decided by the Census of Population Division, and the Expert in Demography. The data processing equipment and facilities required for the data base has already been procured under the Project. The Expert on Computer Programming and the staff of the Data Processing Division are now engaged in test running of the IBM 9377 Computer and operating system and development of designs for the data base. According to current assessments it would be possible to get preliminary outputs from the data base by the end of 1988.

User Services

A wide variety of users would benefit from the population data base. Provision of direct access to the data base to government institutions is under consideration. This would allow economic planning agencies, population policy planning divisions and regional planning offices to have current information which they have not been able to earlier secure readily. Because of the time and cost considerations, it was' difficult to publish data for small sub-national areas needed by different authorities. The preparation of programmes for retrieval of such data when necessary specially from census files where time taken for creating and processing any data files is long and costly has prevented many

users from benefiting fully from the available information. The data base would also enable the construction of population estimates and forecasts for sub-national areas, the type of approximate estimates frequently required by planners and administrators at sub-national levels. The publication programme of the Department will also be facilitated by the production of print-ready complete reports of a number of statistical publications and the Project would thus substantially strengthen the user services provided by the DCS.

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