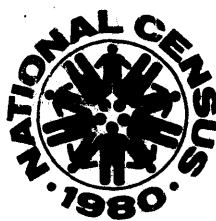


PAPUA NEW GUINEA



1980

NATIONAL CENSUS PROJECT

SUMMARY TECHNICAL REPORT

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This summary technical report on the 1980 National Population Census has been prepared for the East West Population Institute of the East West Center, for inclusion in its publication 'Censuses of Asia and the Pacific 1980-81'. It should be noted that the report is thus aimed at an international audience and particularly persons working in the population field.

It has been printed by the Census Project at this stage in response to requests from data users within Papua New Guinea for a summary overview of the census project. This summary report will form the basis for the broader Census Directors Report which will enlarge on many aspects more relevant to persons within Papua New Guinea. The Census Directors Report will be one of the Projects technical report series.

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I INTRODUCTION AND BACKGROUND

(a) General Description

Papua New Guinea became an independent nation on September 16, 1975. It occupies the eastern half of the island of New Guinea and some 600 associated islands, the largest of which are New Britain, New Ireland and Bougainville. The western half of the main island of New Guinea is the Indonesian Province of Irian Jaya, while Australia and the Solomons Islands lie to the south and east respectively.

The terrain of the mainland and the larger islands is rugged. High mountain ranges are a feature, extending up to 4000 metres in several places; the highest being Mount Wilhelm in central New Guinea which is 4706 metres above sea level. Fast flowing rivers descend to the coastal plains joining some of the worlds largest swamp systems.

The coastal population is generally thinly clustered in villages, but there are areas of higher density in some coastal areas such as the Gazelle Peninsula in East New Britain and the Maprik area of East Sepik. Over one third of the population live in the densely populated highland valleys of the New Guinea mainland.

Papua New Guinea is notable for the relative lack of contact by people from other countries. Prior to Independence, the southern part was an Australian colony and the northern part was administered by Australia, but under a mandate from the United Nations. Australia gained this mandate after the First World War, when New Guinea ceased to be a German colony.

Up until the Second World War, little development took place in the country. After World War II, development assistance from Australia increased considerably but even in the 1950's administration patrols were still establishing first contact with the people of some of the remote valleys.

Papua New Guinea is also noted for its cultural and linguistic variety, with over 700 languages being spoken. However, Hiri Motu and particularly Melanesian Pidgin have now spread widely and are the common lingua franca. English is the language of education, higher administration and commerce.

(b) History of Census Taking

Prior to 1966 there had been two distinct types of census conducted in Papua New Guinea. The least important one was that which covered the non-indigenous population at the same time as the Australian Census. This group comprised only 25,000 persons out of an estimated 2 million in 1961.

The other more important type were the administration censuses of the indigenous population. These censuses collected a considerable amount of information for administrative purposes and usually a summary of population figures for each patrol area or census division. They were of limited value for population information because of the few items which were only available in summary form, a lack of simultaneity and, often, incomplete coverage. Despite these limitations, they did provide the essential base for the first true census in 1966.

The 1966 census was the first to attempt to provide estimates of the total indigenous and non-indigenous population at the one point in time. A complete enumeration was conducted in all urban areas and rural non-villages (RNVs). RNVs is the accepted local census term for missions, plantations, and similar non-traditional rural settlements. A ten percent sample was taken of the traditional villages. The data available from the administration village census was the base for this sample. This first census raised considerable enthusiasm and was generally accepted to have been a success.

In 1971, a virtual repeat of the 1966 operation was attempted. However the social and political climate had changed considerably since 1966. It was an uncertain time, not very suitable for conducting such a major operation. Local political feelings which were building towards self government and independence resulted in a decline in numbers, quality and enthusiasm of the non-citizen staff available in rural areas. Non-citizens at this time still held most of the senior positions. The standard of the National staff was not high as most were new trainees. The support from Australia was also much less than in 1966 and only a very short preparation period was allowed.

Preliminary results of the processing of the 1971 census showed a probable major under-count. A demographer was commissioned to analyse the demographic data available from 1966 and 1971, and some very limited data available from small post-enumeration surveys. He produced a set of recommended adjustment factors which were applied to the data. Only the adjusted results were published. Unfortunately the adjustment process was never fully recorded and considerable doubt has been cast on the final figures.

Proposals were put forward in early 1975 to continue a five year census cycle by having a 1976 census. However there was little support particularly due to the closeness of independence in 1975. Proposals for a census were deferred each year until a firm date was finally fixed for 1980 to be the first post-independence census.

(c) Legal status for conducting a National Census

The 1966 and 1971 Censuses were conducted under the authority of the Census (Papua New Guinea) Act 1966. There was also a Statistics Act 1950 in effect. Both of these acts were considerably out of date particularly after Independence in 1975. Work commenced on a revised Statistical Services Act in 1976 which was circulated to all concerned departments and agencies in 1977. It was intended that this act cover both the Population Census and all other statistical collections. In 1977 the draft new act met a certain amount of opposition. It was re-drafted and re-circulated in 1979 with the expectation that all stages of approval would be completed by 1980 so that the 1980 Census could be conducted under the authority of this new act. Unfortunately it was not fully approved until February 1981. When it became obvious that the new Statistical Services Act would not be approved in time for the 1980 Census a submission was put to Cabinet to re-validate the Census (Papua New Guinea) Act 1966 for the 1980 census. This was approved and the census was conducted under the authority of the 1966 Act.

(d) Organisation of the National Census Project

As noted earlier, the 1980 Census was the first census to be fully organised and processed within Papua New Guinea. In the early stage, the scale of the project was badly under-estimated. It was initially assumed that the project could be conducted by a relatively small section working under the Bureau of Statistics. As planning progressed it was realised that this was impossible and the project was up-graded and enlarged to become a semi-independent Division of the Prime Minister's Department although formally still linked to the Bureau of Statistics.

It was realised very early that the project would need the resources (staff, transport etc.) of many branches of the government if it was to be a success. Thus a high level co-ordination body was essential. Initially it was proposed that such a co-ordinating committee be at ministerial level or at least chaired by a minister. This was rejected. Finally it was decided that a National Steering Committee would be established at Department Head level under the chairmanship of the Secretary, Prime Minister's Department. The Steering Committee was given the full support of Cabinet and in particular the Prime Minister. The National Steering Committee only met twice but it did give the authority necessary to the working sub-committees, which met more often, and to the day-to-day operations of the project itself.

The Users Advisory Committee was formed quite early and submitted proposals on coverage and topics for the census. It and its sub-committees met more often during the stages of development and in the post-census stage as tabulations and publication strategy were being firmly decided.

During the early stages of development of the Census project, the Papua New Guinea Government decided to establish 19 separate Provincial Governments in the country. The Provincial Governments were to take control of most government functions in their province. Thus it was essential to have a separate Provincial Steering Committee in each province. These were established and usually chaired by the Administrative Secretary of that Province. Senior Headquarters project staff attended at least one meeting of the steering committee in each province but the Provincial Census Officer was the key person servicing the committee for his province.

These co-ordination arrangements are shown in Appendix A.

The organisation of the Census project itself was changed considerably during the development phases. Staffing at the senior levels was a continuing problem. Positions were not highly enough classified initially and were temporary and thus unattractive to national officers. A large proportion of the positions eventually had to be filled with overseas staff but most were under-studied by a national officer.

Appendix B gives the final functioning structure of the project in early 1980. The urban operations section largely consisted of staff of the permanent urban surveys section of the Bureau of Statistics (later the National Statistical Office). The tabulation and publications section was the part-time commitment of the permanent population section of the Bureau of Statistics. Due to staff shortages, research staff were almost all assigned to operational duties later in 1980 and were reformed as a unit at a much lower level in 1981. The operational branch continued on a much reduced level in 1981 to service the 1981 sample operations. Conversely the processing branch built up to full strength in early 1981 and is now slowly decreasing in 1982.

The project organisation will formally terminate at the end of 1982.

The permanent sections of the Bureau of Statistics will be fully re-activated and it is hoped that some additional positions will be approved to create an on-going new Population and Social Division of the new re-named National Statistical Office to control all continuing census functions.

II DESIGN AND EXECUTION

(a) Preparation and planning

1. Coverage

Early in the planning stages of the 1980 Census it became obvious that the project would only have full support if it undertook a complete enumeration. The two previous censuses, in 1966 and 1971, had been sample censuses of the rural village sector. The major factor in the demand for a complete count was the desire for small area data for planning purposes. Census project staff advised the Government that a complete enumeration was possible but the collection period would have to be spread over at least three months. Also all branches of Government would have to be willing to release a large proportion of their staff, transport and other resources for varying time periods. This commitment was given and planning proceeded on this basis. Major factors which had to be borne in mind were the logistical difficulties of operations in Papua New Guinea at this stage of development and the relatively low education level of many of the staff available.

As expected, members of the Users Advisory Committee initially proposed a very large number of questions for the Census. Census staff were very aware that nothing too ambitious should be attempted in this, the first complete census. Many of the user requests for economic topics were particularly applicable to the urban areas or the rural non-villages (RNVs). Other requests would be reasonably satisfied if only provincial totals were available. This particularly applied to the more detailed demographic questions. Thus the following compromise strategy was recommended to the Government and accepted.

- . All urban areas, RNVs and a sample of rural villages would be covered with a 'long' questionnaire containing 26 questions.
- . The remaining rural villages would be covered with a 'short' questionnaire containing 12 questions. (These 12 questions were also on the 'long' form).

As planning proceeded field officers stated that this strategy was too complex. Field supervisors in rural areas could not operationally manage two questionnaires, two sets of training materials and two field plans. The original strategy was also tried in the major pilot test and besides operational problems, it was found that people were missed in the boundary between sample and non-sample areas because of the lack of clear definition.

With Government approval, the rural sample with the 'long' questionnaire was deferred to 1981 and all rural villages were covered with the 'short' form in 1980.

The 1980 operation was then far more manageable and the limited 1981 operation allowed more attention to be given to the rural 'long' form sample. The rural data has been of a much higher quality than would have been achieved in the original plan.

2. Sample Design and Coverage

The essential base for the rural village sample was the village census books. These books which were originally up-dated regularly during administrative patrols had fallen into disuse in many Provinces during the 1970's. They were re-activated in all provinces during the period 1977-80 as part of a separate but very closely related project titled the Provincial Data System (PDS). The aim of the PDS project was to re-activate and expand population summaries similar to those in the past and also to collect social data for village units on a uniform basis (e.g. access to schools and aid posts). With the full operational staffing of the Census project in early 1979 the PDS was totally integrated into census preparation. Completion of at least the first round of PDS was the first task of all provincial census officers. This task did fall well behind schedule and some areas were still being covered in early 1980 and some very remote areas were never covered. This delay in PDS as a base for the rural sample was an added reason for the deferral of the sample operation to 1981.

As PDS data was completed for a province the census divisions (CD's) were placed in two to five strata, depending on the size of the province, to form the base from which the sample would be drawn. Stratification was done using factor analysis applied to most of the data items available from PDS. Most weight was given to demographic items as the major purpose of the rural sample was the fertility and mortality measures. Strata derived in the office were field checked with provincial staff and adjusted if thought desirable.

A two stage selection method was then used. Two CD's were selected (with replacement) from each stratum, on a probability proportional to size basis. The villages in the selected CD's were then grouped into clusters of approximately 1000 inhabitants and one cluster selected from each CD. In a few cases CD's were doubly selected and two clusters were selected (without replacement) from that CD. Selection of two clusters per stratum allows calculation of standard errors for estimates using the World Fertility Survey Program "CLUSTERS".

The national sampling fraction was approximately 1:15 but was allocated between provinces in proportion to the square root of the rural (short form) population. The number of strata were varied to accord with the sample allocation; e.g. a sample allocation of 10,000 resulted in five strata, with two clusters of 1000 per stratum.

Considerable assistance in sample design was given by personnel from the Australian Bureau of Statistics.

3. Mapping and Dwelling Listing

(i) Rural

Rural Villages: The first basic step in the rural mapping programme was a thorough stocktake of available base maps. It was soon established that there was no comprehensive set of maps available of village locations. There had been some attempt to map the location of village sample clusters for 1966 and 1971 censuses. Also the university and several other organisations had produced partial maps for some provinces or some areas showing locations of most villages during the 1970's. However there had been no comprehensive programme ever mounted to show all village locations. It was thus decided that the major initial effort for rural mapping would be directed at producing a series of maps showing the location of every village. A major advance which made this possible was the production of a 1:100,000 series covering the whole country by the Royal Australian Survey Corps. These 1:100,000 maps became available during 1978 and 1979 and formed the base for the census series. The 1:100,000 maps showed some but not all of the villages and were based on aerial photography of several years previous. Thus the first initial task of the mapping programme for the Provincial Census Officers was to locate every village unit on their 1:100,000 maps or a similar base. To do this they had to also establish an up-to-date list of village units. This was not an easy task as villages move, join and are deserted over time. An added problem was that, in some areas, there are not nucleated villages but a dispersed settlement pattern. For these areas the rest house for that clan or sub-clan was taken as the location. The rest houses were established points where clans gather for most administrative services e.g. voting, health services, etc. However during the 1970's some of the rest-houses had fallen into disuse and local field investigation was often necessary to establish a suitable alternate location.

When firm lists were drawn up and locations marked, the lists and maps were sent to census headquarters for checking. From the base maps, a provincial map was drawn for each province in ink on transparent matte base drafting film. The maps varied in scale from 1:400,000 to 1:100,000 depending on the density of census units for that province. The lists were entered on computer records to form the key register for the census. Dyeline copies of first drafts of the maps and copies of the computer listings were sent back to provinces for checking. The cycles of checks and corrections took several rounds and several months. The maps showed roads and rivers as well as village locations.

Preliminary plans were for the next stage to be a mapping of dwellings within villages. It was acknowledged that this was impossible to attempt for the whole country but it was hoped to map dwelling locations for at least the clusters of sample villages. Early pre-tests were directed at determining the feasibility of this dwelling mapping and the subsequent field procedure of house to house enumeration. It was found that house to house enumeration was not practical and mapping of dwelling location for villages was abandoned. This is discussed in more detail in the pre-testing section.

Rural Non-Villages (RNVs): Rural Non-Villages (RNVs) is the local terminology for non-traditional settlements in the rural areas e.g. schools, missions, plantations. The same initial tasks had to be done for RNVs as for villages. A comprehensive list had to be drawn up and the location of each unit plotted. Listing of RNVs was more difficult in one aspect in that they were not originally covered by administrative census patrols and thus there was no established list to use as a base. However many were shown accurately on the 1:100,000 series and also they often occupied alienated land of which there were good records. Also the 1966 and 1971 censuses had attempted to draw up lists of RNVs. From all sources it was possible to establish a comprehensive list and to locate the RNVs on the base maps. Thus the listing and plotting of RNVs became part of the system of village listing and plotting. RNVs were generally added to the provincial maps in the same way as villages. However in some provinces the larger RNVs were shown by shading their land area. This was particularly effective for plantations and settlement schemes.

In some areas of the country, particularly near the major towns, there is a very dense clustering of RNVs. These particularly include migrant settlements some of which are organised and recognised by the government, others are not. To ensure coverage of these, special aerial photographs were taken in some areas and larger scale maps drawn.

It was always planned that RNVs should be censused house to house and thus detailed sketch maps of dwelling locations were essential, if at all possible. Instructions were issued to add RNVs to the round of village censuses being done during 1978/79 as part of the Provincial Data System (PDS)

and as part of general national census preparations. The RNVs were to be sketch-mapped and dwellings numbered sequentially on the sketch as well as, at least, an estimate obtained of the total population. Unfortunately this instruction and the necessary list of RNVs were often issued late and not all RNVs were covered. However most of the major RNVs were mapped and numbered and the numbered maps served as a dwelling list for enumerators. RNVs which were migrant settlements were a particular problem as dwellings changed rapidly. (e.g. new ones added, others demolished etc.). For these settlements the sketch maps usually only showed the location of clusters of dwellings. The urban settlement procedure of using a dwelling sticker was applied during the actual enumeration. Usually the dwellings were not pre-numbered but the sticker was put on the dwelling after it was censused to show it had been covered. This enabled supervisors to check for complete coverage of all dwellings at that cluster or for the whole rural settlement. Aerial photographs of settlements also proved ineffective for detailed dwelling location as many dwellings were obscured by trees.

Census Division (CD) Boundaries: Census Divisions (CDs) were the accepted terminology for the division of provinces into groups of villages. CDs were usually only defined by the villages in them and no accurate mapping had ever been done to locate boundaries. Each CD usually contained people of a similar cultural and linguistic group and were usually a geographic grouping so that the one administrative patrol could cover the whole CD during the one continuous (originally walking) patrol. One of the major tasks of the base rural mapping was to show the CD boundaries for the first time. Attempts were made to follow geographic features wherever possible e.g. rivers, ridge tops.

Census Unit Numbering: As part of the listing and locating exercise a unique number had to be allocated for each census unit. Considerable development work went into the derivation of this numbering system as it was realised that once developed it would be used for a considerable number of other purposes besides the census. An attempt was also made to ensure that the system was the same or at least compatible with any existing numbering systems if at all possible. The final system derived was:

1st and 2nd digit: 01 - 20 Provinces numbered sequentially
 3rd and 4th digit: 01 - 99 District number within province
 Maximum number allocated 7
 5th and 6th digit: 01 - 99 CD numbers within province grouped
 as follows

01 - 74 Rural CDs
 75 - 79 Rural CDs administered by one
 province but legally in another
 province.
 80 - 99 Urban CDs

7th to 9th digit: 000 - 999 CU numbers sequentially within CDs grouped
 as follows:

	<u>Rural</u>	<u>Urban</u>
001 - 399	village numbers	Urban CUs within
400 - 499	small RNVs	gazetted town
500 - 599	large RNVs	boundary

600 - 699	Urban CUs only - outside gazetted town boundary	
900 - 999	Rural CUs administered by one province but legally in another province	

The final result was a unique nine digit number for each CU.

Example:

PROVINCE	DISTRICT	CD	CENSUS UNIT
1	9	0	2
1	2	1	3
0	3	0	3
2			2

For mapping purposes the number was shown only once at the relevant geographic level e.g. CD number shown only once with the name for the whole CD, CU number given with the name for that location e.g. 025 Bitapaka Village.

Final Rural Maps: The resulting rural location maps were a major advance for the country and were warmly received by many branches of the government. Copies of the relevant section of the provincial map were supplied to the census patrol going to that area. In practice, local knowledge was used more often for direction finding than the map. The standard of map reading of field staff is very low. It had been hoped that field staff would also supply corrections to the maps. In practice very few were received. There is no doubt that the rural mapping exercise was an essential one. The maps and the associated lists were the key base for coverage. The maps themselves were rarely used in the common manner practiced in other countries but they were the first step towards the international system, if it is applicable, in future. They were all that was necessary, given the field system applied in 1980. The rural census maps are still in great demand and will be of great use in interpretation of the results of the census and for other purposes. In particular they have been used as a base for a series to show electoral boundaries accurately for the first time.

(ii) Urban

The definition of an urban area adopted for the 1980 Census was very similar to that adopted for the 1966 and 1971 Censuses. This was that the settlement should be generally urban in character, a minimum population of 500 persons and a minimum density of 500 persons per square mile at the time of the census. The boundary criteria was relaxed slightly in 1980 to ensure that migrant settlements associated with an urban area were included with that urban area.

It was decided to separate urban preparations from rural preparations and place urban mapping and listing under the control of a special section located at Census headquarters in Port Moresby. This Section's first task was a complete stocktake of all available base resources. Some records and maps were available from the 1971 Census but the boundaries of both the total urban areas and each CU were not at all clear. It was decided to embark on a complete exercise of clearly defining every urban area and re-drawing new CDs. Papua New Guinea is fortunate in that most urban areas have been

surveyed and cadastral maps at scale 1:4000 were mostly available. Also recent aerial photography was available for many of the urban areas. As with most developing countries, urban areas in Papua New Guinea are a mix of formal sub-divided areas usually of high or low cost housing, and areas of planned or unplanned settlements or villages usually with self help or traditional housing. The methodology to be adopted in the different areas explains the mapping and listing system which had to be applied.

Planned Urban Areas: These were to be completely pre-listed during 1979 and 1980. Each interviewer was to be given a folder showing his area clearly defined and an accompanying list of the dwellings starting from a clearly marked start point. An enlarged aerial photo of his CU was also to be supplied wherever possible.

Settlement or Village Areas: Only the boundaries were to be clearly defined early and in the week prior to the census the supervisor was to stick a census sticker, with the CU and consecutive dwelling number, on each dwelling. He would draw up a listing at the same time. The dwellings would then be allocated to interviewers.

Non-Private Dwellings: These include hotels, hostels, communal workers quarters, jails and single barracks. These were to be done by a special team using a sketch map for each of the non-private dwellings. They were extracted from normal CU workloads, usually in planned urban areas.

The task of the urban mapping and listing section during 1979 and 1980 was:

- (i) Define the boundary of each urban area so that it followed geographic features wherever possible and included all migrant settlements or other locations closely connected economically with the core urban area. This boundary was drafted in headquarters and later confirmed or adjusted in the field.
- (ii) Using aerial photographs and cadastral maps divide the planned urban areas into Census Units (CUs) of approximately 50 dwellings.

Again the CU boundary was to follow geographic features wherever possible. Every attempt was also made to follow electoral ward boundaries and the 1971 CU boundaries, if available. The headquarters team for that urban area then listed every dwelling in each census unit. CU boundaries were adjusted on return to headquarters wherever necessary to meet the size or boundary criteria. Non-private dwellings were sketch-mapped separately and given a separate CU number.

- (iii) Using aerial photographs and field checks clearly delineate the boundaries of urban settlements and villages. While in the field an approximate count was made of dwelling numbers but no detailed list was made.
- (iv) When all boundaries were finalised they were transferred by the mapping section to transparent matte base film copies of the 1:4000 cadastral maps. The boundaries and CU numbers were shown by stick-on, transparent screened numbers and symbols. After careful checking copies were produced using an ammonia dyeline printer with 2 tone paper. The screened symbols and numerals showed up as red whilst solid linework copied as a blue colour.
- (v) Interviewer folders were prepared as described earlier.
- (vi) Master control maps, lists, dwelling summaries and aerial photomosaics were prepared for urban supervisors and integrated into an overall control programme.

The above programme was extremely ambitious and only just met its deadlines. However we are confident that, as a result the urban coverage was very thorough and the best possible.

4. Pretests and pilot test

There were strong reasons for planning a comprehensive testing programme for this the first complete enumeration in Papua New Guinea. The testing programme for the two previous censuses had been very limited and the 1971 census had produced a sizeable under-count. There had also been considerable changes in the country during the 1970's with self government and independence. A two form strategy was decided early and both a 'short' form and a 'long' form with associated field controls, manual and training materials had to be developed.

The pre-testing programme commenced in 1978 and culminated in the Madang District Pilot test, a full dress rehearsal which concluded in February 1980. The broad aims of the pre-tests can be summarised as -

- . To investigate all aspects of coverage in as many varied situations as possible to ensure everyone was counted once and once only.
- . To arrive at standardised operational procedures for enumeration in villages, rural non-villages and urban areas.
- . To develop and finalise questionnaire design.
- . To develop and finalise field staff selection and recruitment procedures.
- . To develop and finalise a system of field quality control.
- . To assess individual and team work rates and thus recommend workload and team composition for differing operational conditions.
- . To provide information and realistic examples for use in training manuals, workbooks and verbatim guides and to test these materials in field conditions.
- . To give staff experience in conducting census activities.

The total pre-testing programme covered 17 of the 20 provinces and 6 urban centres. The pretests are best discussed in four groups:

- (i) Early urban tests - Urban censuses were conducted in five urban centres in 1978. The project was not fully established or staffed at this stage and these censuses were the result of provincial requests rather than part of an organised series of tests. However the opportunity was taken to test sections of draft questionnaires or urban operational procedures at each of the censuses. The final census in 1978 of Lae,

the second largest town, was a major test of both the draft long form questionnaire and most urban procedures. Some of the results of the urban tests were:- the numbering system for settlements was evolved; a two visit system was tested and abandoned; an urban control system was developed; the decision to bind books of questionnaires was made; a quality control system was developed; a basic workload of 50 dwellings per interviewer was arrived at, and considerable progress made in questionnaire design. By the end of 1978, a broad operational system had been decided for urban areas and attention was re-directed to the rural areas.

- (ii) 1979 Rural 'short form' tests - These tests centered on the development of an operational system in the rural villages to ensure maximum coverage. House to house enumeration was tested and rejected as it was found impossible in a reasonable time period to locate all the dwellings even in nucleated villages. Nuclear villages have outlying clusters of houses and garden houses or beach houses which are periodically occupied and very difficult to locate. Also men often sleep together in 'Men's Houses' but eat and work with their families which caused confusion. In areas of scattered settlement, problems were even more severe with houses for the one clan often miles apart and scattered across rugged virtually inaccessible terrain. The alternative was to use the established procedure for the earlier administrative censuses in which all the people for that village or clan gathered at a central point and were enumerated there. In this procedure it was possible to check against the village census books which had been re-established during the pre-census round of the Provincial Data System (PDS). Tests did show that house to house enumeration was more effective than the central point method in some cases, but the time taken to locate every dwelling made it impractical for universal application.

It was decided to tie the 1980 census very closely to the village books and concentrate on improving on them as a base. In the final procedure each family was called up in turn from the list on the village book. For the purpose of this 'line up' census a 'Household' was defined as a nuclear family unit, normally a 'Head' with his wife or wives and unmarried children. They were asked about additional family members or visitors, and their name, age and sex from the village book transcribed onto a 'family record card'.

This card had been developed during the pretests to formalise the interview process, to relieve interviewers of the task of sorting out household composition, and particularly to alleviate the problem of complete recalculation of age. They took the card to one of a team of 1980 census interviewers who again checked for additional members or visitors as they completed the census form for the family. Both the central man with the village book and the census interviewer were to check the age as recorded and re-estimate if necessary. A revised 'Notable Events Book' was produced to assist with this. A check was also made for additional families after the list of persons from the village book was exhausted. It was established that considerable publicity would have to be targetted at encouraging people to gather for their village census.

During this series of tests the Census questionnaire, short form, was changed from a vertical format (questions on the top) to a horizontal format (questions on the side). The wording and order of the questions was also improved. Attention was particularly given to translation problems and mis-interpretations. A Pidgin and Motu version of the questions was developed.

Tests were also conducted on interviewer recruitment and field quality control which resulted in a recommended standard and selection test being set for interviewers and a field quality control procedure being established for supervisors.

By August 1979 we were confident of our short form design and operational procedures to be used in the final pilot test. Most of the research team at this time, were fully occupied in producing a complete set of training materials including interviewer and supervisor verbatim guides, field manuals for interviewers, supervisors, district officers and trainers as well as interviewer and supervisor workbooks in which practical exercises were completed during training. The emphasis in the training was for trainees to be actively involved in mock interviews, oral tests and the like, culminating on the last day in a practical session in which a village census was conducted under close supervision. Only very limited testing of the programme and the materials had been possible in the pretests. The remaining research staff were joined by senior urban staff in producing and testing a revised 'long form'.

- (iii) 1979 Rural, Urban and RNV 'long form' tests - Very little work had been continuing on the long form since the Lae urban test. A re-design was produced which basically merged the now finalised short form with the additional questions from the Lae questionnaire. It was decided that the format would have to be horizontal to contain all the questions in a reasonably understood manner. This 1979 pre-test version also fully incorporated data processing requirements for the first time. Colour shading for code boxes and non-codable items was introduced for the first time and found to be highly successful both in the field and for later processing.

This series of tests particularly focused on questionnaire design for this, our major questionnaire. Tests were conducted in villages, RNVs and there were two small scale urban tests. Considerable improvements were made in wording and order of the questions as a result. Translations into Pidgin and Motu were also produced and taken into account when revising the English wording.

The rural village tests were used to re-test the recommended field procedures. The urban tests were particularly used to give staff experience in long form interviewing and some quality control formats were developed. Both sets of tests were used to determine workrates and to gain an insight into the extra skill needed for long form interviewing as contrasted to short form interviewing.

The rural non-village tests were the first major tests of procedures in RNVs. The use of dwelling stickers as a means of marking dwellings which had been censused, in rural migrant settlements and in government settlement schemes, was developed. This was later also applied in some peri-urban areas where rural villages often contained a high proportion of migrants. Plantation procedures were also tested and revised.

By November 1979, a very comprehensive pre-testing programme had been completed and questionnaires and procedures were ready for a thorough test in the main pilot test. The only other small test conducted was one with the Defence Force to establish how their normal operational procedures could be varied to fit in with rural census requirements.

- (iv) The Pilot test. - It was decided to have a major pilot test covering one complete district of Madang Province. This district contained approximately 100,000 persons and included an urban centre of 20,000 persons, a variety of RNVs and rural villages spreading from islands and a coastal belt to a mountainous hinterland. A full dress rehearsal operation was conducted and all questionnaires, control documents, manuals, training materials and administrative procedures were tested.

The major result of the pilot test was that it confirmed the recommendation to defer the rural sample to 1981. Field staff had considerable difficulty managing two different operations, one short form and one long form, with different questionnaires, manuals and training materials at the same time. Also sample clusters were not clearly defined and people were missed on the boundary between sample and non-sample areas.

The rural short form operation did go very well in the pilot test and few changes were recommended. The urban and RNV operation did expose some weaknesses and improvements were recommended to procedures, the long form questionnaire and to the training materials. The pilot test was the first major test of the training materials and overall the fully scripted verbatim training guides and accompanying workbooks proved to be a success.

Thorough de-briefings were held after each stage of the pilot and work rapidly commenced on re-drafting all forms, procedures, manuals etc for the main operation. Processing of the pilot data did commence immediately but unfortunately little feedback was possible into the final documents. One change which was made as a result of processing was the colour for the shading on the questionnaires. The pilot colour of pink proved wearing on the eyes of processing staff and was changed to green and blue for the main operation.

The major weakness of this very comprehensive testing programme was that the pilot test was too close to the main enumeration period. Little time was allowed to incorporate changes after the pilot test and, as noted, very little feedback was possible from processing or from the results.

5. Questionnaire content

The short form questionnaire sought the following information:

For each household member -

- . Name
- . Relationship to head
- . Sex
- . Date of Birth and/or Age
- . Citizenship
- . Province and District of Birth
(Country if born overseas)
- . Highest school grade completed
- . Current school attendance (yes/no)
- . Activity last week (choice of 10 activity codes)

For all members of each household -

- . Selected household economic activities e.g. growing coffee (9 categories)
- . Sources of non-wage income e.g. selling fish (8 categories)

The long form questionnaire covered the above questions plus the following:

For each household member -

- . Period of Residence at current location
- . Usual residence at time of Independence - Sept. 1975
- . Training details
- . Whether mother still alive & if so, person number on questionnaire.

For females 15 years of age & over -

- . Total number of children ever born (M & F) and whether now dead, living elsewhere or living at that location
- . Date of birth of last born child and whether now alive or dead.

For all persons 10 years of age and over -

- . Language spoken most at home
- . Language spoken most at the market
- . Church membership and name of church

For all persons 10 years of age and over and engaged in money raising activities -

- . Occupation
- . Name of employer
- . Industry

For the dwelling unit -

- . Tenancy of dwelling
- . Type of dwelling (10 categories)

Copies of the two questionnaires are given as Appendix C.

(b) Publicity and Training

1. Publicity

The publicity campaign for the 1980 National Census was the most comprehensive and the largest single campaign to publicise a government project since independence was achieved in 1975. The diversity of Papua New Guinea's population presented a special challenge. The publicity campaign had to reach people who varied from doctors and lawyers to subsistence farmers and from urban dwellers to people in remote mountain valleys.

The high illiteracy and the variety of languages spoken presented special problems. The decision to make the 1980 census a complete enumeration made the task easier in some aspects than the previous census when only a sample was taken. The publicity campaign was designed with different facets to reach differing target audiences. The staff devoted full time to publicity from the project were few but considerable co-operation was given by most branches of the government and private media organisations in the country.

A major target of the publicity campaign were teachers and students. The schools provided the best means of spreading information throughout the country. Pamphlets and other material were distributed to teachers at in-service training courses in 1979 and 1980. Teachers distributed the material as part of population projects and encouraged their students to go home and tell their parents about the census and the reasons for it. The Education Department made 1980, 'Population Awareness Year' and gave considerable support and assistance. A particularly successful innovation was the distribution of thousands of colourful disks to school children with the project name, slogan 'count me in' and a smiling face on each. These were commonly worn by children around their necks on a piece of string and certainly helped awareness of the census.

The PNG press responded well to census releases and helped to achieve the aim of keeping people aware of census planning and of the main enumeration period. Both press releases and feature articles were used to keep the census in the public eye. From the onset it was realised that the broadcasting medium would have to play a major part in census publicity. In all, over 15 vernaculars were used for census publicity broadcasts as well as English, Pidgin and Hiri Motu. Feature programs, plays and discussion sessions were all used. A regular weekly program was very well received by the more educated sector of the population, particularly in urban areas. A film and several video tapes were also planned. However only one video tape was finally produced. A change of government in early 1980, prevented a major video tape with considerable segments by the previous Prime Minister from being used.

Despite a low level of literacy, much of the publicity material had to take a printed form. In some cases, material was printed in five highland languages as well as English, Pidgin and Motu. The booklets were commonly read to groups of people while they looked at the pictures. Static visuals and well-illustrated pamphlets played a major part in census publicity. Displays were used in some provincial shows and demountable photographic displays were distributed to all provinces for use in village situations.

Other media used were theatre advertising, stamps, sandwich boards, and car bumper stickers. A printed T-shirt was used as an official census interviewers uniform and proved an excellent way of alerting villagers and householders to the presence of census teams. Four competitions were run for a poster, slogan, song and essay at different stages of the publicity programme. The essays provided excellent feedback on all aspects of the Census operation and some poster designs were used in final publicity material and were widely distributed. A Census logo was also designed and used on all census stationery, questionnaires and equipment as a quick and easy way to identify the census.

As well as general awareness, the publicity programme focused on publicising the need for a national census and the uses to which the data could be put. Special pamphlets were prepared for public servants, women, census workers and teachers. A booklet was prepared on 'The Census Questions' and one on 'Questions and Answers about the Census'. The recruitment programme was integrated into publicity aimed at public servants, teachers and students. These groups formed the majority of census workers who numbered over 5000 persons.

A more restricted target group for publicity were the higher level policy makers or implementers at the National and Provincial level. Publicity material was integrated into all user meetings and meetings of National and Provincial Steering Committees. Special submissions were prepared for National and Provincial cabinets. A monthly newsletter was prepared and distributed from early 1979. It detailed the progress of the census program including pictorials of census operations and proved very popular.

The publicity programme did prove very effective and has been hailed as a model for future similar exercises in the country. Enthusiastic support was given to the project at the political and administrative level by all branches of government. Many private organisations also joined in to assist. Cases of refusal were extremely rare and there were no expressions of public opposition to the census. There were still cases of remote villages who had not heard of the national census before the census patrol arrived. It seems that without considerable additional expense there is no means of making such groups aware of such a project.

The post-census publicity program includes the production of poster maps of results for school children. Media releases are made as results become available and pamphlets are planned explaining the major results. The census newsletter has continued on a quarterly basis to keep higher level policy makers and other users informed on census processing and the availability of results. A detailed archival collection of all photographs and other publicity material has been established for future use.

2. Training

Considerable attention was given to training throughout the project. Very few staff from the highest to the lowest levels had any previous census experience.

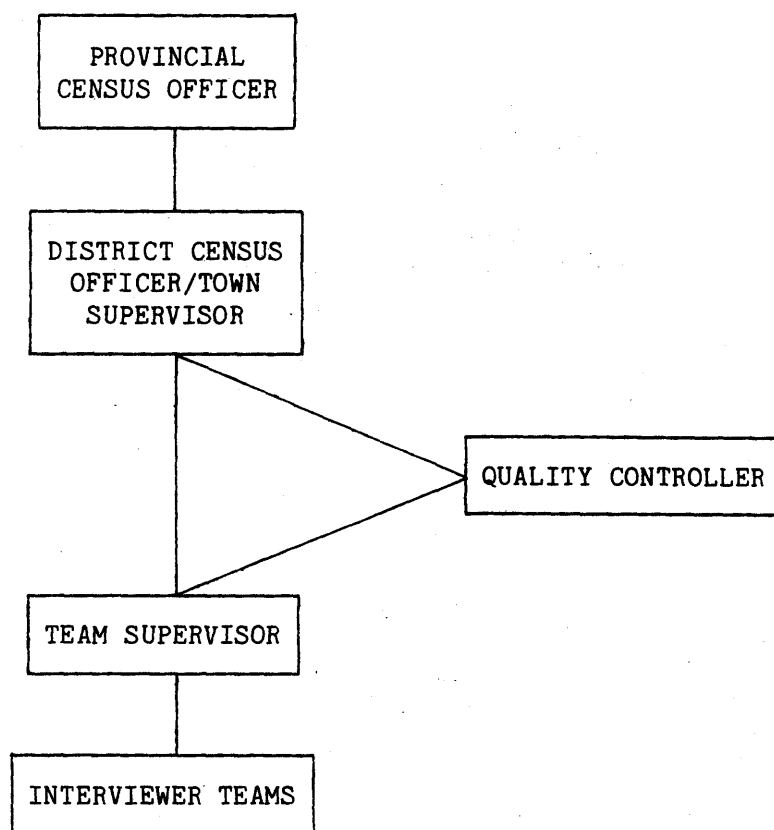
At the headquarters level, every possible advantage has been taken of international training opportunities. This was considerably supported by in-house formal and on-the-job training. All pre-tests and the pilot tests were particularly viewed as training operations. For provincial staff, four week-long Provincial Census Officers' conferences were held. These conferences were particularly for briefing and co-ordination purposes but had a large training component. Provincial staff were involved as much as possible in pre-tests and the pilot test. Senior headquarters staff visited provinces regularly for co-ordination purposes but usually a large element of training was also involved.

The development of the training scheme and materials for field staff were dealt with in the pretesting section and details of the implementation are in the main enumeration section. The major feature of the field staff training was the use of verbatim guides and workbooks. Verbatim guides were used in previous censuses in Papua New Guinea and it is thought they are essential to ensure uniform application of the questionnaires in a country with poor communications and often inexperienced trainers. The workbook was an innovation for the 1980 census and proved highly successful. Considerable effort was put into the preparation of the field training material and it has been hailed as a good example for any similar exercises in the country.

Training of processing staff followed a similar pattern to that of the field staff. However no verbatim guide was necessary as all staff were trained at the one central location. Quality control measures were kept for all processing staff and re-training done whenever necessary. The final training now proceeding is in analysis of data. The demographer is conducting both formal and on-the-job training in data analysis for a group of permanent staff. The 1980 census relied very heavily on overseas staff and it is expected that the considerable emphasis on training now, will mean considerably less reliance in future.

(c) The Main Enumeration

The operational structure adopted in each province is given below:



The structure functioned in a different manner for differing aspects of the operation in each province. There were usually four distinct phases of the operation in each province. These are best discussed separately.

1. Rural village and small RNV operations
(short form coverage)

Organisation - The general plan was for one census team, of a supervisor and group of interviewers, to enumerate all the short form CUs in a particular CD. The Provincial Census Officer (PCO) in some cases working with the District Census Officer (DCO), made a detailed operations plan for each patrol. This covered team size, timetable, transport, census material supplies, other supplies and funding. In Papua New Guinea such detailed logistical arrangements are the basis of successful operations. The average

team size was one supervisor and four interviewers. Patrol duration averaged about three weeks. Methods of transport varied from light aircraft to canoes and trucks with almost always a major walking component. Patrols were normally staged out of the District Headquarters with the DCO in charge of detailed day-to-day operations. In most cases in Papua New Guinea once a patrol is in the field no contact is possible until they return and thus good preparations, including training, are essential.

Recruitment and Selection - Staffing was a problem in many areas because of the generally low educational level. Supervisors were recruited mostly from rural public servants or teachers. Often no selection was possible and whatever staff were made available by the local administration, had to be taken. In some cases supervisors had to be specially sent in from provincial headquarters when no local staff were available. Every attempt was made to recruit interviewers from the local area. In the most remote areas of some provinces local recruitment of suitable staff proved impossible. For these areas we took advantage of the services of the Papua New Guinea Defence Force (PNGDF). The men of the PNGDF covered about 6% of the total population through patrolling some of the more remote and inaccessible areas. The PNGDF used the census partly as a training operation for themselves. Generally the rural people responded well to the PNGDF enumerators and increased attendances at census points were reported as people were curious to see what defence force men were doing in their village.

Training - A one week training course was conducted for all teams usually at the District Headquarters. Instructors came from provincial or national training units or from longer term national census staff. The course consisted of a two day course for supervisors, two days for both interviewers and supervisors and a one day field trial followed by a de-briefing. The training materials were all pre-packaged with fully scripted training guides and workbooks.

Enumeration Methods - In villages the census was conducted at a central point for each village or clan with families coming up in turn as their names were called from the village book. More detail is given in the pretesting section. In RNVs the enumeration was done on a house to house basis.

Coverage Checks - As well as the coverage checks described in the pre-testing section, three special checks were carried out for the whole CU.

- . A check was made for any non-listed RNVs at that CU e.g. schools, aidposts, migrant settlements.
- . A check was made of all the sub-clans covered by that CU and whether they had all been enumerated.
- . A check was made of the 1980 total population of that CU against previous PDS records. If there was a difference of more than 20% this was to be investigated and a reason given.

These three checks were on a special census unit summary form which was to be filled in by the supervisor after each CU was enumerated.

A complete patrol coverage check was made by the quality controller and the DCO when the patrol returned to district headquarters. There were cases of villages dis-appearing or combining with other Census Units. A common problem was that census pads for small RNVs were combined with those for the nearby village raising doubts that they may have been missed. There were also cases of unlisted settlements being located and included.

We are confident that the highest coverage possible was obtained by this comprehensive series of coverage checks.

Quality Control - The most effective quality controller was the supervisor. He was instructed to check every form while in the field and was given an interviewer report form to complete for at least the first few days for each interviewer.

These procedures were not entirely effective and there were cases of interviewer mistakes carrying through complete patrols. On return to District Headquarters, a specifically trained quality controller went through all the forms and made basic checks on completeness, addition etc. In particular the general standard of addition was poor. As mentioned above a complete coverage check was also done. As staff were often re-employed on a later patrol, attempts were made to give feed-back on mistakes before they returned to the field. This was not possible in some cases where quality control was centralised at the provincial headquarters due to the lack of suitable staff at the district level.

Programme - Most provinces arranged their patrols so that the outlying areas were covered first and then moved into the more accessible areas. This meant that staff could be re-employed more on further patrols. The earliest rural short form patrols were in May 1980 to the remote areas of West Sepik. All provinces gradually joined in with most starting after the completion of the South Pacific Arts Festival in early July. We were anxious to avoid any disruption caused by this major festival. The peak of rural census activity was in late July and August. Some rural short form patrols carried on over September and into October. These were principally in areas close to towns or where staff could only be obtained in the September school holidays.

2. Large RNV (CUs 500 +) and special long form area operations (Long form coverage)

The 500 series CUs included plantations, mining camps, government stations, settlement schemes and large missions. They are places of varied economic activity and thus places for which users require more detailed economic information. This and the problems of representing them in the rural sample were the major reasons for making these CUs a special category and enumerating them with the long form.

Another group which was enumerated with the long form were the specially designated long form rural areas. These were:

- . The CDs around the capital - Port Moresby
- . Part of the CD around Lae, the second major town
- . Popondetta CD which surrounds the town of Popondetta and includes a mixture of oil palm settlements, blocks and villages. There is considerable movement between the blocks and the villages.
- . The Gazelle Peninsula, East New Britain, which is one of the most economically advanced areas of the country, is densely populated and has a mixture of RNVs and villages.
- . The whole of Manus Province.

These areas, except for Manus, are areas of varied economic activity, high mobility and generally, areas for which more information was required. Also an adequate pool of more educated staff were available. It was therefore decided to enumerate them completely with the long form. Manus was a special case. It was planned to conduct the rural sample with the long form in 1981. Because of its small size, the sample for Manus would have to cover a large proportion of the population. It was decided that this was unnecessary. Manus is the most educated province with the best available workforce. They could adequately manage complete coverage with the long form in 1980 and this was decided.

Organisation - The large RNVs were covered by special teams trained at provincial headquarters and usually controlled directly by the PCO. Most of the large RNVs were in areas with road access but in some cases the team had to be flown in, or shipped in, to enumerate an isolated plantation or government station. As with other operations, these special patrols were all pre-programmed in detail. The special long form areas were also usually controlled directly by PCOs. A more senior member of the census project or another department, was usually given supervision of this special aspect of the operation. The procedures used were similar to those of other rural operations but more

attention was paid to coverage. In some villages a complete house to house census was conducted and dwelling stickers were used. In others, at least a detailed post enumeration check was made at all dwellings in the evening to ensure everyone was covered. This special attention to coverage was necessary because of the high mobility in these areas. Near the main towns it is common for people to spend the weekend in the village and weekdays in the town. In these areas enumeration was restricted to weekdays.

Recruitment, Selection and Training - Higher level staff were generally selected for all long form interviewing. The questionnaire was more difficult and usually the field procedures needed more care. Students from teachers colleges, grade 11 and 12 high school students, university students and the best grade 10 school leavers were used. The training was the same basic long form format but had to be varied to take account of the different types of CUs each team was working in. This training was usually given by the PCO himself or another of the census senior staff.

Enumeration Methods - House to house enumeration was generally applied through all the large RNVs and in many of the long form areas. Special techniques had been evolved in the pre-test for some of the problem areas. These were discussed in the pretesting section.

Coverage Checks - For the large RNVs a special section was put on the CU summary for the supervisor to complete. This was a check of the number of dwellings covered against the number on the sketch map which had been drawn earlier. For the special long form area villages, the same checks as for the short form applied.

Quality Control - Quality control was generally centralised at provincial headquarters. If the RNV or long form area teams were going out and returning each day, a daily check on quality was attempted. This enabled rapid feed-back on errors. With long patrols to remote RNVs, this was obviously not possible and checks had to wait until their return.

Programme - The long form RNV patrols were usually restricted to September/October 1980. Many provinces completed their rural short form operations before they started their long form RNV operations. They found this easier to manage operationally. The special long form area operations were, except for Manus, done in the main operations period from 22 September to 3 October. As they were near urban centres it was best to co-ordinate them with the urban operation. The Manus rural operation was completed in four weeks in August and early September.

3. Urban Operations

(Long form coverage)

Organisation - A Town Supervisor was appointed for each designated urban centre. Most of the town supervisors were senior officers either from census headquarters, the National Statistical Office or statistical branches of other Departments. Considerable attention and importance was attached to the urban operation. The major reasons were:- urban procedures were more complex than rural procedures; the long form was to be used throughout; the urban centres were assumed to be the major areas of under-enumeration in the 1971 census. As noted earlier, urban preparations were largely managed by the urban operations section based at census headquarters. This was done because few provincial staff had any experience in urban census procedures and because they had a very heavy workload with their rural preparations. However most PCOs were given urban experience either in the last urban pre-tests in Mount Hagen and Port Moresby or as trainers and observers for the Madang Pilot test. PCOs were gradually brought directly into urban preparations from early 1980. As firm appointments of towns supervisors were made they worked with PCOs to ensure all preparations were proceeding on schedule. The PCO managed recruitment, publicity and accommodation preparations which had to be done early at the local level. The urban operations section was responsible for the preparation of a "complete package for each urban centre including CU folders, master control maps and aerial photos where available, control sheets, training and operational supplies and a draft operational plan.

Town supervisors received their training in Port Moresby or in one of the two courses conducted in the Highlands and the New Guinea Islands. They developed their final operational plans while keeping in close contact with the Urban Operations Section and the PCO. The PCO was in overall charge of the urban operation but the PCOs detailed involvement varied greatly between provinces depending on the ability and experience of the selected town supervisors.

Interviewers were allocated one CU of approximately 50 dwellings to enumerate over a two week period. Interviewers were grouped into teams under a supervisor. The ratio was 1 supervisor to approximately 5 interviewers. A special team was formed to enumerate communal living quarters - local terminology Special Dwellings (SDs). One quality controller was responsible for checking the work of two teams.

Interviewing was conducted in the lunch hour, afternoons and early evening. Supervisor and quality control checks were done later in the evening or in the mornings.

Recruitment and Selection: Because of security problems in Papua New Guinean towns most interviewers and supervisors were males. The majority of quality controllers were females. Supervisors were selected from a pool of available public servants and teachers. Interviewers principally came from high schools or teachers colleges. If possible, teachers were teamed with their own students as they already knew each other well. Some unemployed school leavers were also selected. Interviewers were of at least grade 10 level or students currently studying grade 10. Quality controllers were female teachers or public servants.

Training: The urban training for supervisors was for 22 hours spread over the two weeks prior to interviewer training. Supervisors then had to check list their CUs or for settlements and urban villages, list and number the dwellings. Supervisors then attended and assisted with interviewer training. Interviewer training was for three days and the Saturday morning prior to enumeration. A field test was conducted on the Friday afternoon and evening. The training materials were all pre-packaged with fully scripted training guides and workbooks.

Enumeration Methods and Coverage Checks: All enumeration was house to house. Interviewers worked their way progressively through their workload of approximately 50 dwellings. Papua New Guinean respondents are very co-operative and refusals were rare. Non-citizens who often live in houses surrounded by high wire fences with dogs were a problem to contact and were generally less co-operative. A careful check was kept on vacant dwellings and non-contacts. Supervisors were to re-check all vacant dwellings and help solve non-contacts. Quality controllers kept tallies of non-response and high rates were investigated by the town supervisor or his assistant. Towards the end of the main enumeration period, publicity was directed at getting people who had not been censused to ring certain contact numbers. The careful preparation, pre-testing and the coverage checks should have ensured the best possible coverage.

Quality Control: Quality Controllers were given the full supervisor training plus a segment on their own role. Their role in checking coverage was explained above. They also had a major task of maintaining quality of data with the more complex long form and were trained to apply a series of detailed consistency checks. The major problem which arose was the short time they had to check the forms each day before the interviewers returned with the forms to the field. This was severe in the first few days when errors were common. The quality controllers role was a vital one and was, in general, quite successful.

Programme: The main enumeration period allocated for the urban operation was 22 September to 3 October 1980. Smaller towns completed their operation early, some within a week, while the larger towns continued operations on a reduced scale into the third and fourth weeks. Urban high covenant areas proved difficult to complete because of non-contact problems.

4. 1981 Rural Sample Operations

(Long Form coverage)

The rural sample was drawn from areas covered with the short form in 1980. It excluded urban areas, 500 series RNVs and the special long form areas. Only 18 provinces had to be covered as Manus and the National Capital District had been covered by the long form in 1980. The main emphasis with the long form in the rural areas was on the demographic questions. Economic activities in rural areas are largely agricultural and not very varied and thus relatively easy to collect.

Organisation - The 1981 sample was quite a small operation compared to the 1980 operation. It was decided that the operation would be controlled regionally and only four regional census officer (RCO) positions were provided for 1981. However some other 1980 staff particularly from census headquarters did assist in some provinces. Operations in each region were staggered province by province. The basic structure of operations from 1980 was maintained but the RCO was in direct charge and no DCOs were employed. Another variation was that a quality controller was sent on each patrol, when possible, to provide on the spot checks on quality. This was thought necessary because of the complexity of the long form compared to the short form.

Recruitment and Selection - The best staff from 1980 short form and long form operations were selected and used, if available. Some new recruitment was necessary in some provinces. In most provinces, operations were staggered so that only one or two teams were used covering several clusters of villages. The maximum use was made of the best staff.

Training: In most cases 1981 training was a re-training exercise as most staff had worked in 1980. However a complete training course was conducted to ensure all were fully aware of the complexities of the long form.

Enumeration Methods - The same methods as for the short form operation in 1980 were applied.

Coverage Checks - The same CU summary form and checks were applied as in 1980. The total population enumerated in 1981 was compared to the 1980 census population. This gave a tighter check. Some differences were discovered and faults were identified both in the 1980 operation and in the 1981 operation. This exercise enabled the 1981 sample operation to function partly as a post-enumeration check on the 1980 results. Most differences seem to have been caused by climatic changes between 1980 and 1981 or seasonal differences caused by the 1981 enumeration being at a slightly different time than the 1980 operation. These differences are being further analysed.

Quality Control - As noted a quality controller did go on most 1981 patrols. Also a centralised quality control check was carried out for each province. Due to the small scale of the operation the RCO often did this check himself or at least closely supervised it. Adoption is very common in PNG and this was the major source of error in the fertility data. Even with careful checks we are sure errors remain because of this.

Programme: RCOs were allowed considerable flexibility in designing their programme for 1981. Attempts were made to hold the 1981 operation at the same time as 1980 in areas with seasonal crops but, as noted this was not always possible. The first patrols started in March 1981 and the last were completed in early December 1981.

III DATA PROCESSING

(a) Preparation and Planning

1. Background

In 1978 when serious planning for the census processing commenced, data processing was in a relatively undeveloped state in Papua New Guinea. The government National Computer Centre (NCC) was the major processing installation in the country but had experienced considerable staff and other problems. The major task of the NCC was processing the government payroll. A few statistical collections had been processed using the NCC but most had experienced major delays and general lack of co-ordination. The 1966 and 1971 censuses and the on-going trade and taxation statistics collection were all processed in Australia. The PNG National Statistical Office was at the time formulating a firm proposal for their own computer or at least data entry facilities. Australian authorities had notified that they would not be able to continue assistance once 1976 data for trade and taxation was fully processed.

Staff availability and ability were two of the biggest unknown factors. Initially, processing or at least partly processing the census in one of the South East Asian Countries had been proposed as an option, mostly for this reason. However this option was dismissed by government advisors as politically unacceptable. They also particularly foresaw the training of staff in these new skills as a major reason for processing the data within the country. A favourable factor was that the labour market had recently changed to a situation in which there were a surplus of grade 10 school leavers. However the location of these unemployed school leavers and their interest in and suitability for data processing was unknown.

2. Lae Urban Pretest Processing

The urban pretest in Lae in late 1978 provided a reasonable volume of data for a processing test to at least answer some of the unknown factors. It was decided to establish a mini-processing centre in early 1979 and process the Lae questionnaires through all stages of editing, coding, transcription, data entry and production of tabulations. A major recruitment campaign was launched to test the availability of the work force.

There was a very high response to the recruitment campaign which solved this query. A selection test was applied to all those who responded and the successful 15 persons were deliberately recruited across the range of scores on the selection test. Their work output was found to correlate strongly with the selection test scores and the test was then adopted as the first screen for all future processing recruitment. Generally work quality and work rates of coders and editors were better than expected. Labour turnover was high but acceptable. We were thus confident that we would be able to adequately staff the main processing centre in 1981/2.

The Lae questionnaire had no allowance for coding space or code boxes on the form. Coding was done on the questionnaire but later transcribed to special data entry sheets. This transcription proved to be a major source of error and was definitely not recommended for the future.

Data entry was done at the National Computer Centre on 'blind' key boards. The data entry rates were found to be relatively low and error rates relatively high. This gave firm basic figures for throughput calculations but raised many queries on possible alternate equipment.

Tables were successfully produced using COCENTS on the NCC computer. Overall the Lae pretest processing was a worthwhile exercise. It answered several queries and provided firm basic work throughput figures for staff and equipment planning.

3. Choice of Equipment

After the Lae processing a significant amount of time was spent in considering Datapad as a device for data entry. Datapad is a data entry device. Staff would enter data by writing codes on special paper positioned on the programmed and sensitive 'pads'. However this was finally rejected for a variety of reasons, one of the main ones being that it was an unproven concept for bulk data entry. Another major factor was that both the long and short questionnaires had been redesigned during 1979 with code boxes where required and colour shading for all items to be entered onto computer records. This made standard keyboard entry far easier.

It had been firmly established by mid-1979 that the National Computer Centre did not wish to manage data entry for the main census processing.

They saw their contribution as the production of tabulations from clean data on their main frame computer and possibly the handling of major edit runs. However they thought the census office should buy its own small computer and data entry facilities for data entry and at least basic editing. The National Statistical Office was then proceeding through a series of options to a choice which resulted in a tender for its own medium size computer and related data entry facilities. It was established that these NSO facilities would also not have capacity for census processing given the considerable back-log of other statistical data waiting to be processed.

In August 1979, the government issued tender specifications for the processing of the census data. Five proposals were received which varied from the purchase of equipment or the lease of equipment to data entry at one company's own site. It was finally decided that purchase of equipment was most suitable for the long term interests of the country. A short intensive evaluation was carried out in late 1979 and the Honeywell proposal was accepted. The equipment is detailed in section III (c). The major features of the equipment were that the data entry would be through formatted VDUs, operator statistics would be easily produced, basic edits on range and consistency could be done at data entry and on line correction could be performed at reasonable speed. Another major factor was that the NSO tender had also resulted in the choice of Honeywell equipment. Both locations using the same equipment meant back-up in emergencies was available. The equipment was installed in March 1980 firstly at the NCC, later moved to the National Statistical Office at Waigani and finally fully installed at census headquarters in August 1980. Delays in building alterations at census headquarters were the cause of this movement.

4. Pilot test processing

While work was proceeding on the choice of equipment, other data processing staff were developing a complete system for manual and

computer processing with all associated controls. Unfortunately few of the available staff had sufficient suitable experience and the coding frames, computer edits and imputations developed at this stage were a major cause of later problems. It was decided to conduct a complete test of the overall processing system using the pilot test data as it became available in late 1979 and early 1980. As noted earlier, the pilot test was conducted too late for the tabulated results to be taken into consideration in re-design of the questionnaires, training and field procedures. This was unfortunate. Only broad indications from early editing and the total field counts could be taken into consideration.

Pilot test processing proceeded from February to November 1980. Data entry in particular had to be delayed until the building alterations were complete at census headquarters in August. All computer systems and programs were also being developed, written and tested over this period.

It was found that work rates for editing and coding and data entry rates had been considerably under-estimated from the Lae processing exercise. However several new data items and codes had been added to the final questionnaires since the Lae census. Overall we were able to make slight reductions in most of our staffing estimates for the main census processing. An important two-way test was made of the editing system to be used in processing the short form data. The data was processed once using automatic imputation and once using manual correction of computer identified edit queries. The results of this test were reviewed and it was decided to adopt automatic imputation for the main census for the short form data. This decision caused major problems which are discussed later.

The pilot test processing was a very useful exercise in that it gave a test of systems and equipment and gave more realistic throughput statistics. However it suffered greatly in that most research and senior staff were heavily occupied with the conduct of the main census operation. There were major problems with the processing system and equipment which were only partly identified at the time and few steps could be taken to solve those that were identified.

In late 1980 NSO and Honeywell staff triggered a crisis review by stating that their evaluation was that the computer system used in the Pilot processing could definitely not cope with the main census processing. Steps were then taken to redesign the computer system. This is discussed later.

(b) Main Census Processing

1. Preliminary Field Counts

The government had insisted that preliminary field counts for each CU, CD, District and Province be available if at all possible by the end of 1980. The major reason for this was so that work could proceed on setting new electoral boundaries for the 1982 elections.

The major obstacles to this deadline were field logistical problems. Completed census pads had to pass back through the chain of command in provinces and then be returned to Port Moresby. It had been hoped that a considerable proportion of the rural pads would start to arrive in September/October 1980. In practice, most provinces pads arrived as a near complete unit in November with a few remaining ones arriving right up until mid December. This made the preliminary processing schedule very tight.

A register of all CUs by CD had been established based on the PDS and urban listing. These were printed out and checked for each CD as the pads arrived. Basic checks were also made on addition for each questionnaire and through to CU totals, it was again found that the standard of addition by field staff was poor. The total of persons, males and females for each CU were written against their CU names on the computer sheets and passed to data entry for entry onto computer records. The most time consuming task was finding lost CUs or finding a reason why they had gone out of existence as a population centre. Some cases of CUs missed in the field were located and these were rapidly censused or if that was impossible, a value was imputed. Such CUs were then recensused in 1981.

Considerable effort was put into correcting the register. It was used for the production of these field counts and also then as the main production control register. Other information was entered at this time e.g. CU type codes for urban CUs and RNVs. It was the first task under pressure to be faced by our computing staff and equipment and a few problems did arise. Also the old building complex which houses the census project was completely re-arranged during this time from a field operations centre to a data processing centre. However, finally all problems were solved and all CUs located or imputed (less than .1%) and preliminary field counts were produced on 30 December 1980. Booklets giving lists down to CU level were subsequently printed and distributed during January and February 1981.

2. Manual Processing

It had been planned to commence Manual Processing of the data in October 1980. This proved impossible because of the late arrival of the forms, the re-arrangement of the building and because most senior staff were heavily involved in the production of the preliminary field counts. The main recruitment was conducted in December 1980 with training starting between Christmas and New Year. The first processing was under way in early January 1981. Short form processing started first. Separate teams were established for editing, check editing, coding and check coding. The basic flow of documents went quite well and work rates were higher than anticipated. The overall system of manual processing had a rather elaborate system of records and controls. Many of these proved unnecessary and very time consuming and were later deleted. Long form processing started in April 1981 and the same basic system as for the short form was used except that coding was split into two areas with the more difficult questions being coded by a specialist group. Better staff were used on the long form manual processing because of its greater complexity. Manual processing of both short and long forms proceeded throughout 1981. Manual processing of the short forms was completed in October 1981 and the 1980 long forms in December 1981.

The 1981 sample long forms joined the processing system in October 1981 and were through manual processing by January 1982. Overall, manual processing of both forms was quite a smooth operation. Work rates were higher than anticipated and less staff were needed than expected.

3. Data Entry

As noted earlier, problems were identified with the computer processing system in late 1980. One of the major problems was the slow rate of data entry, principally caused by slow machine speeds. In late 1980 it was recognised that the complete system for data entry, editing and amendment was badly designed and generally too complex. Additional systems staff were supplied on loan from the National Statistical Office and the system was completely re-designed in late 1980 and early 1981. This did not completely solve the problem of slow machine speeds. Honeywell staff worked closely with census staff to solve the problem.

The level 6 machine was upgraded from a model 47 to a 57 (on loan) and the project purchased an extra .5 of a mega byte of memory. Priorities were also re-arranged in the operating system. It was not until May 1981 that all these steps were implemented. Data entry which had been proceeding uncertainly at less than 5,000 keystrokes per hour, took a dramatic increase to over 8,000 keystrokes per hour on average with some operators reaching over 12,000. We were by then well behind schedule. The government supplied extra funds and a night shift for data entry was implemented to catch up part of the back-log. The night shift worked extremely well. All short form and long form data from 1980 was processed by Christmas 1981. Only part of the 1981 sample data remained at the end of the year and this was entered by early April 1982.

4. Automatic Imputation

After the pilot test, it was decided to use automatic imputation for several items of the short form data. For the main census, it was noted that the rates of imputation were higher than regarded as acceptable. The main problems arose with age. Not stated ages and corrections on stated ages were to be imputed largely based on relationship.

On checking the basic data we found that coding and field errors in relationship were causing more distortions in the data than they were correcting. The major problem was adopted children being identified as true children. This was not so common in the pilot test area and given the smaller scale of the pilot test processing, most such occurrences were edited out during manual processing. After a thorough review it was decided to cease automatic imputation of ages. During this review, major errors were found in many of the computer programs which had been inadequately tested. A major cause was that the coding structures were unnecessarily complex leading to complex program specifications which were never fully understood by the programmers involved. Nothing could be done about the coding structures at this stage. It was decided to re-design the complete system of automatic imputation and re-write all programs. All original short form data was re-run through this redesigned system. Several fields continued to be subject to automatic imputation but the imputation rates were considerably lower for these. Also the imputed values were reasonable. Not stated ages were identified, printed out and values imputed manually. The re-design of this system and the rewriting of the programs delayed this phase of the operation considerably.

5. Manual Editing

For the more complex long form, it was decided to mainly rely on manual correction of computer identified edit errors. The writing of programs for these computer edits was also delayed considerably as systems and programming staff were occupied re-writing the short form imputes and other aspects of the system in which errors had been found. The 'main' edit of the long form data started in December 1981 and should be completed by May 1982 including 1981 sample data. Manual correction or imputation was specified for the long form for all the item tests contained in the short form automatic imputation. However an imputation package was also applied later to the long form data to ensure that these were definitely done and thus a consistent set of imputations was applied to both short form and long form data.

When first tabulations were produced we were able to identify several consistent errors either in the field, coding or data entry. Some of these were caused by the poorly planned coding systems. Special edits were designed and applied to the data to identify records possibly with these errors. These were checked manually and corrected if necessary. This procedure is still continuing at this time - April 1982. It is now hoped to have all data 'clean' by the middle of this year.

6. Tabulations

Tabulations are being produced using the 'COCENTS' tabulation package. The package has proved quite efficient. Unfortunately the first tabulation system produced in 1981 has been found to be poorly designed and the complete system had to be redesigned in 1982. The redesign has resulted in a far more flexible system which takes far less time. It will allow a better service for specialist user requests as well as speedier production runs. Tabulation lay-out was also re-designed at the same time to give much better clarity.

7. Review of Data Processing

Problems with data processing were not unexpected. Staff turnover at the senior processing levels has been high and a major factor in the problems. However most of the problems have been successfully resolved. 'Clean' data should be available 18 months after the commencement of processing which is a reasonable achievement for the first census to be processed in the country.

(c) Equipment

A full list of equipment at Census Headquarters, the National Statistical Office (NSO) and the National Computer Centre (NCC) is given below. As noted earlier it had originally been planned to use the NCC for tabulation production and possibly main edits. This has not eventuated. With the up-grading of the census machine, there is now capacity for both at census headquarters. The terminals linking to the NCC were used early for programme development and are used for other survey work.

The NSO facility has not been used at this stage but the WANG and the plotter will certainly be used for publications. The census office also currently has one of the small terminal printers on loan from NSO to assist with tabulation development.

1980 National Population Census Office

Central Processor:	Honeywell Level 6 Model 57, 1 mega byte
Disk storage:	2 x 67 mega bytes (was 33 mega byte)
Tape drive:	9 track, 1600 bpi, phase encoded
Line printer:	300 lines per minute
Terminals:	20

National Statistical Office

Central processor:	Honeywell Level 6 Model 47, 1.5 mega byte
Disk storage:	2 x 256 mega bytes 1 x 67 mega bytes
Cartridge disk:	2 x 5 mega bytes
Line printer:	600 lines per minute
Visual displays:	30
Terminal printers:	4
Word processor:	WANG (S-Screen)
Plotter:	techtronix graphic terminal foolscap size flat bed plotter

National Computer Centre

I.C.L

Central processor:	2 x ICL 2950, each 1 mega byte
Disk storage:	5 x 200 mega byte
Tape drives:	4 x 9-track tape drive, 1600 bpi, PE
Line printer:	2 x 1500 lines per minute

Honeywell

Central processor:	Honeywell Level 6 model 47, 1 mega byte
Disk storage:	2 x 67 mega bytes
Diskette	
Line printer:	1 x 300 LPM
Type drive:	1 x 9 track 1600 bpi

Communication lines

- (a) between the census and NSO Honeywell computers
- (b) two ECS 4000 terminals and one terminal printer at the Census Office connected to one of the ICL 2950 computers.

IV DEFINITIONS

(a) De facto/de jure

It is not possible in Papua New Guinea to use a single night as a reference point for census enumeration purposes, as is done in many other countries. A mixture of de facto/de jure rules were applied.

In urban areas and rural non-villages persons who spent the night previous to the day of enumeration at that dwelling were counted.

In rural villages, all persons who usually lived in that village, but who did not spend the night previous to the day of enumeration in an urban area or rural non-village were counted.

Under these rules, it was, of course, quite possible for a person who moved about during the enumeration period to be counted more than once (at various places) or not at all. However, assuming that population movements are fairly uniform over time, the application of these rules should have given an accurate count of the total population.

(b) Urban/Rural Villages/Rural Non-Villages

For operational purposes, the country has been divided into three sectors: urban areas; rural villages; rural non-villages. These are defined as follows.

An urban area was defined as a settlement with a generally urban character, a minimum population of 500 persons and a minimum population density of 500 persons per square mile (about 195 persons per square kilometre). For the boundaries of the larger urban centres the density criterion was applied a little more loosely in order to set boundaries conforming with geographic features and, in particular, to include migrant settlements closely associated with that urban center.

The rural village sector consists of all traditional villages, hamlets, etc. in rural (i.e. non-urban) areas.

The rural non-village (RNV) sector consists of all persons living in rural areas other than those in rural villages (e.g. persons living on missions, plantations, schools, settlement schemes).

For publication and operational purposes the RNV sector was divided into two groups, 'large' RNVs and 'small' RNVs.

'Large' RNVs are generally over 100 persons but include all RNVs of 'unusual' economic activity irrespective of size e.g. sawmills, plantations, mining camps, larger government stations and settlement schemes. These were enumerated with the 'long' form in 1980.

'Small' RNVs are generally less than 100 persons and are the type of location which is closely related to traditional villages e.g. schools, aid posts, small migrant settlements. These were enumerated with the 'short' form in 1980.

(c) Economic Activity

It was decided not to attempt any sophisticated measure of economic activity in the 1980 census. Questions on hours worked or income were very unlikely to be successful in the census interview situation. It was decided that these are best measured by sample surveys.

Individuals, 10 years of age and over were asked what they did most of the time last week. Their answers were coded in the field to codes from 01 to 10 as shown on the questionnaires in the appendix. Codes 01 to 04 give a measure of all persons earning money from wage jobs, business or farming and also include unpaid helpers in businesses. Note that persons earning any money from farming were to be included in 04 even if their major activity was subsistence farming. Code 09 gives a measure of 'open' unemployment, those who were looking for work. Thus code 01 to 04 plus 09 will give a measure of the Labour Force. There are a considerable number of persons coded 08 (too young, old or handicapped) or 10 (other activities) particularly in the younger age groups. It is known that many of these are available for work but were not openly seeking it as they knew none was available. These persons should be taken into consideration in any analysis of the work force or unemployment.

For households two sets of questions were asked on economic activity. The first set (Q 11 short form, Q 23 long form) asked whether anyone in the household was engaged in a series of agricultural or pastoral activities. No time period was given and they did not have to receive any income from such activities. All are commonly cash crops but they could have been immature at that stage. It is thought that such information at the household level is often more useful and valid than individual data, particularly for rural areas of Papua New Guinea. The second set (Q 12 short form, Q 24 long form) asked about a series of sources of income in the last 12 months. This information is very useful for both the rural and urban areas.

(d) Occupation and Industry

All persons 10 years and over who were engaged in any money earning activity (activity codes 01 to 04) were asked their occupation and industry.

Occupation was coded using a recently developed draft Papua New Guinea National Classification of Occupations (PNGNCO). This was based on the International Standard Classification of Occupations (ISCO).

Industry was coded using a recently developed Papua New Guinea Standard Industrial Classification (PNGSIC). This was based closely on the International Standard Industrial Classification (ISIC).

(e) Households

The definition applied for a household was quite different in rural villages to urban areas and rural non-villages.

In rural villages, a household was defined as the nuclear family unit, usually a 'Head' with his wife or wives and unmarried children.

In urban areas and rural non-villages, a household was simply taken as all the persons in that dwelling who were included on the 'de facto' coverage rule. No attempt was made to identify multiple households within dwellings. It was thought that such identification would confuse interviewers and survey experience had shown that multiple households are very rare in Papua New Guinea.

Household tabulations have been produced for the three sectors separately. Combined 'all sectors' tabulations are not meaningful.

V. TABULATION AND PUBLICATIONS

(a) Table Series Planned

The first set of draft tabulations was produced as early as 1977. These draft tabulations were changed and expanded as work proceeded on the final questionnaires. A reasonably complete draft set of tables was prepared for the last major user's advisory committee meeting in August 1979. The content of the questionnaires was not changed after this date and very little work was done on the tabulations until after the main enumeration period. During 1981, systems and programming staff were often diverted to other problem areas and only limited progress was possible on the detailed specifications. It was not until early 1982 that urgent attention was focused on the tables. These are the first set of census tabulations to be produced in Papua New Guinea and many of the finer details had to be firmed up in detailed discussions with users in early 1982. At this date, April 1982, discussions are still proceeding with users but most of the major tables have been fully specified and produced for some provinces.

It is aimed to satisfy most major national and provincial users with this first set of tables. Special tables for specialist users will be produced later as resources allow.

The tables listed below have generally been produced at the Province and District level for three sectors - rural villages and small RNVs ; large RNVs; urban. When the tables have been produced for lower geographic levels i.e. CDs or CUs, this has been mentioned. It must be noted that the 'long' form was only applied to a sample of rural villages. The sample was selected on a provincial basis and thus any table with a 'long form only' topic has only been produced at the provincial level for the rural sector and the total province tables.

MAJOR TABULATIONSAge/SexTotal Population:

- 01 Age (single years) x Citizenship x Sex
- 02 Age (5 year groups) x Citizenship x Sex (Percent Distribution)

Citizens only:

- 03A Age (single years 0-12) x Census Division
- B Age (single years 13-24, 25 +) x Census Division
- 04 Age (PDS groups) x Sex x Rural Census Division

Total Population:

- 05 Citizenship x Sex x Census Unit

Marital Status

- 01 Population x Marital Status x Age x Citizenship x Sex
- 02 Married women (with husband present) 15 years and over x Age x Age of husband x Citizenship

FertilityFemale citizens 15 years old and over:

- 01 Age x Number of total issue x Sex of issue x Survival of issue

Female citizens 15 years old and over with known total issue:

- 02 Age x Number of total issue x Educational level x Survival of issue
- 03 Age x Number of total issue x Religion x Survival of issue

- 04 Age x Number of total issue x Migration x Survival of issue
- 05 Age x Number of total issue x Activity x Survival of issue
- 06 Age x Number of total issue x Survival of issue, ever-married
females only
- 07 Age x Sex of issue x vital status of issue

Female citizens 15 years old and over:

- 08 Age x Age of last born child
- 09 Age x Educational level x Age of last born child
- 10 Age x Religion x Age of last born child
- 11 Age x Migration x Age of last born child
- 12 Age x Activity x Age of last born child
- 13 Age x Age of last born child, ever-married females only

Female citizens 15 years old and over showing last born children
in year before Census:

- 14 Age x Survival of children
- 15 Age x Educational level x Survival of children
- 16 Age x Religion x Survival of children
- 17 Age x Migration x Survival of children
- 18 Age x Activity x Survival of children
- 19 Age x Survival of children, ever-married females only

Citizens 0-9 years old:

- 20 Age x Age of women identified as their natural mothers
- 21 Age x Age and educational level of women identified as their
natural mothers
- 22 Age x Age and religion of women identified as their natural mothers
- 23 Age x Age and migration of women identified as their natural mothers
- 24 Age x Age and activity of women identified as their natural matters
- 25 Age x Age of women identified as their natural mothers, ever-married
natural mothers only

Citizens only:

- 26 Age x Sex x Survival of mothers

MigrationCitizens only:

- 01 Province of Birth x Sex x Age
- 02 Age x Sex x 1980 location related to birthplace (i.e. same district, other district in same province, other province)
- 03 Province of Birth x Highest grade completed x Sex, persons at school only
- 04 Province of Birth x Highest grade completed x Sex, persons not at school only

Non-citizens 10 years old and over:

- 05 Country of Birth x Activity x Sex
- 06 Country of Citizenship x Activity x Sex

Non-citizens only:

- 05A Country of Birth x Age
- 06A Country of Citizenship x Age

Citizens 10 years old and over:

- 07 Province of Birth x Duration of residence less than 1 year (in months) x Sex
- 08 Province of birth x Duration of residence (in years) x Sex

Citizens only:

- 09 Province lived in at Independence (1975) x Sex x Age
- 10 Age x Sex x 1980 location related to location at Independence (1975) (ie. same district, other district in same province, other province)
- 11 Province lived in at Independence (1975) x Highest grade completed x Sex, persons at school only
- 12 Province lived in at Independence (1975) x Highest grade completed x Sex, persons not at school only

Population 10 years old and over:

- 13 Province lived in at Independence (1975) x Activity x Sex,
citizen only
- 14 Province lived in at Independence (1975) x Activity x Sex,
non-citizens only

Citizens only:

- 15 Province of Birth x Province lived in at Independence (1975) x Sex
- 16 District of Birth x District lived in at Independence (1975) x Sex
- 17 Age x Sex x coincidence of province of enumeration, province of birth
and province lived in at Independence (1975)

ReligionPopulation 10 years old and over:

- 01 Religious group x Age, citizens only
- 02 Religious group x Age, non-citizens only

LanguageCitizen population 10 years old and over:

- 01 Language spoken at home x Age
- 02 Language spoken at the market x Age
- 03 Language spoken at home x Highest grade completed x School
attendance
- 04 Language spoken at home x Birthplace
- 05 Language spoken at the market x Birthplace
- 06 Language spoken at home x Language spoken at the market

Education and TrainingCitizens only:

- 01 At School x Highest grade completed x Age (single years)
- 02 At School x Highest grade completed x Age group
- 03 Not at School x Highest grade completed x Age group
- 04 5 years old and over x Highest grade completed x Census
Division
 - A. At school
 - B. Not at school

Non-citizens only:

- 05 At school x Highest grade completed x Age
- 06 Not at school x Highest grade completed x Age

Population 10 years and over:

- 07 Type of training x Level of training

Citizens 10 years old and over:

- 08 Training x Highest grade completed x Sex
- 09 Training x Age x Sex
- 10 Training x Activity x Sex

Citizens earning money:

- 11 Training x Occupation x Sex
- 12 Training x Industry x Sex

Non-citizens 10 years old and over:

- 13 Training x Highest grade completed x Sex
- 14 Training x Age x Sex
- 15 Training x Activity x Sex

Non-citizens earning money:

- 16 Training x Occupation x Sex
- 17 Training x Industry x Sex

Self-employed non-citizens:

- 18 Training x Occupation x Sex

ActivityPopulation 10 years old and over:

- 01 Activity x Citizenship x Sex

Citizens 10 years old and over:

- 02 Activity x Age x Sex
- 03 Activity x Highest grade completed x Sex
- 04 Activity x Birthplace x Sex
- 05 Activity x Census Division
- 06 Activity x Duration of Stay in Area

Population earning money:

- 07 Occupation (3-digit) x Citizenship x Sex

Citizens earning money:

- 08 Occupation (2-digit) x Age x Sex
- 09 Occupation (2-digit) x Highest grade completed x Sex
- 10 Occupation (2-digit) x Type of employer x Sex
- 11 Occupation (1-digit) x Industry (1-digit) x Sex
- 12 Occupation (2-digit) x Industry (1-digit) x Sex

Population earning money:

- 13 Industry (3-digit) x Citizenship x Sex

Citizens earning money:

- 14 Industry (2-digit) x Age x Sex
 15 Industry (2-digit) x Highest grade completed x Sex
 16 Industry (1-digit) x Type of employer
 17 Type of employer x District
 18 Agricultural Industry x Selected Occupations

Non-citizens 10 years old and over:

- 19 Activity x Age x Sex
 20 Activity x Highest grade completed x Sex

Non-citizens earning money:

- 21 Occupation (2-digit) x Age x Sex
 22 Occupation (2-digit) x Highest grade completed x Sex
 23 Occupation (2-digit) x Type of employer x Sex
 24 Occupation (1-digit) x Industry (1-digit) x Sex
 25 Occupation (2-digit) x Industry (1-digit) x Sex
 26 Industry (2-digit) x Age x Sex
 27 Industry (2-digit) x Highest grade completed x Sex
 28 Industry (1-digit) x Type of employer x Sex
 29 Type of Employer x District
 30 Agricultural Industry x Selected Occupations

HouseholdCitizen households:

- 01 Distribution of Number and Sex of persons in the household
 02 Activity of head where head earning money
 03 Selected household economic activities x Census Division
 04 Selected household economic activity x Household composition,
 rural sectors only

- 05 Selected sources of non-wage income x Census Division
- 06 Selected sources of non-wage income x Household composition

Citizen Households (Urban Only):

- 07 Dwelling type x Census unit type
- 08 Dwelling type x Household composition
- 09 Dwelling type x Distribution of number of persons per household
- 10 Dwelling type x Activity of head and other household members
- 11 Dwelling type x Dwelling ownership
- 12 Census Unit type x Household composition
- 13 Census Unit type x Distribution of Number of persons per household
- 14 Census Unit type x Activity of head and other household members

Non-citizen households (Urban Only):

- 15 Dwelling type x Census Unit Type
- 16 Dwelling Type x Household composition
- 17 Dwelling Type x Activity of head and other household members
- 18 Dwelling type x Dwelling ownership

Households (Urban and Rural):

- 19 Type of household x Composition of household

Non-private dwellings (Urban Only):

- 20 Occupancy x Census Unit Type

Private dwellings (Urban Only):

- 21 Occupancy x Dwelling Type
- 22 Occupancy x Census Unit Type

(b) Publications

The first publications from the Census were 20 booklets, one for each province, giving preliminary field counts down to the Census Unit level. These were released in January 1981. The National Statistical Office summarized these in two preliminary bulletins released in March 1981. The first contained provincial and district figures for all provinces. The second contained figures down to Census Division level. Only total population, male and female, were tallied and published for the preliminary counts.

When complete tabulations are available for each province it is planned to produce a comprehensive bulletin for each province plus one national bulletin. These bulletins will contain a sub-set of the tabulations given in V(a). It is planned to give sufficient information in these bulletins to satisfy most general users.

Since this was the first complete census of the country, it was thought particularly important to document various aspects of the project. These are being produced as a series of technical reports. The list of available or proposed reports is:

- * No. 1 Publicity
- * No. 2 Sample Design and Stratification
- No. 3 Mapping
- * No. 4 Field Co-ordinator's Report
- No. 5 Census Pretesting
- No. 6 Director's Report

* now available

It is also proposed to publish a series of research monographs giving analysis of the results of the Census. The first monograph 'Urban Growth 1966 - 80' has been published and others are planned by researchers working on the project or for other departments and organisations.

VI Evaluation

(a) Post Enumeration Survey (PES)

No full PES was possible. All resources had to be devoted to the main operation in 1980 with the best staff certainly not available for a PES. The 1981 sample operation partially functioned as a PES. However it was found that differing seasonal conditions had produced quite large migration movements between the two operations in several provinces. For some provinces it will be possible to produce two sets of estimates and it is planned to analyse these. The 1981 sample operation did locate some cases of both under-and over-enumeration and gave an additional insight into quality of data. These have been documented and will be taken into consideration during analysis. Also, in 1981 an urban survey was conducted in Port Moresby at the same time as the census had been done in 1980. Two questions were put on the survey questionnaire relating to census coverage. These results are currently being analysed. Also, where matching of census and survey questionnaires has been possible, a comparison of answers to several questions is being carried out to gain additional insight into data quality.

(b) Other Evaluation

A small demographic unit of three staff headed by an experienced overseas demographer was established in late 1981 to analyse the demographic data from the census. It is planned to conduct a thorough demographic analysis of all available data. This analysis will provide considerable insight into data quality. The demographic unit will be responsible for finally producing detailed population projections based on the census data but which can be varied as any other data becomes available. The National Statistical Office (NSO) will absorb this demographic unit when the census project formally terminates at the end of 1982. The NSO will also be analysing and applying the data to up-date the national accounts and other economic estimates.

Other major users with definite plans to analyse and apply the data are - National Planning Office and Department of Labour for manpower planning; Department of Education for its next five year education plan; and Provincial planners for their local level development plans.

VII CALENDER OF 1980 CENSUS ACTIVITIES

The attached Appendix D gives a broad outline of the Calendar of census project activities. The lead-up period was far too compressed for a country conducting its first complete census. Activities were very restricted in 1978 because of bureaucratic delays largely caused by a general under-estimate of the size and complexity of such a project.

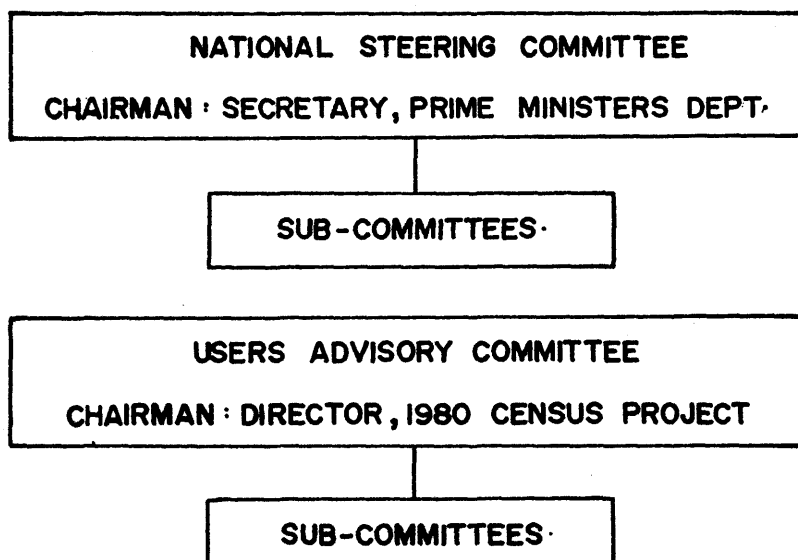
When staff were recruited in late 1978 and early 1979 it took several months for them to become fully conversant with their tasks. Most had skills in their own field of expertise but few had experience at applying them to a census. This slow build-up resulted in far too many activities being compressed into the later parts of 1979 and early 1980. As noted earlier the pilot test was conducted too late to be fully evaluated and this timing is not recommended in future. It was only just possible to meet final deadlines for the main census by the considerable efforts of the government printer and by the assistance of the Royal Australian Air Force in transporting census materials and supplies to provinces. As noted in Section III, Data Processing has lagged behind the original schedules but these were very optimistic given that most aspects of the processing were being done for the first time in Papua New Guinea. Overall the project has met most of its deadlines and the government has expressed considerable satisfaction with the progress and output of the project. The success of the project has largely been due to a very dedicated and hard working team of staff.

APPENDIX A

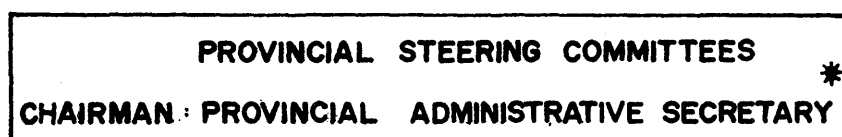
1980 NATIONAL CENSUS PROJECT

CO-ORDINATION

NATIONAL



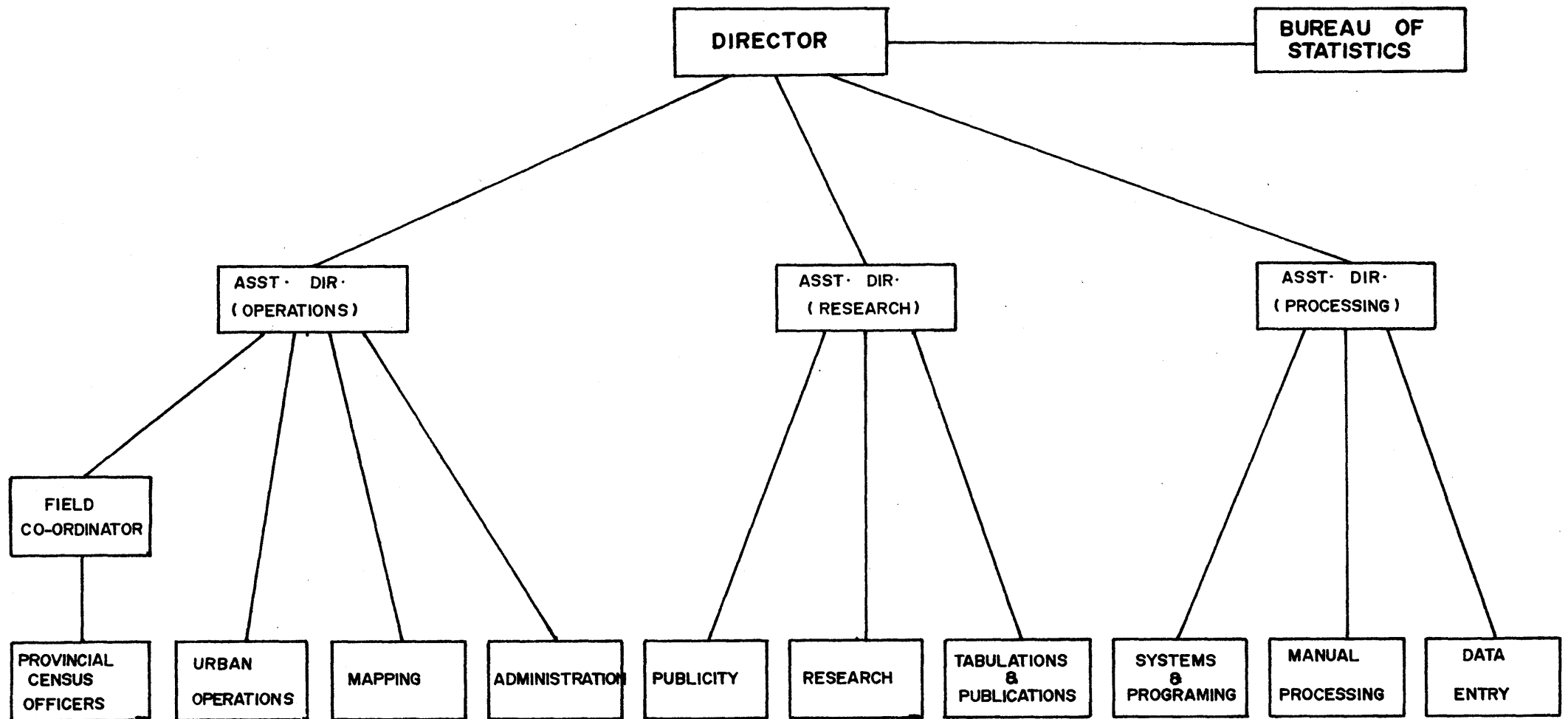
PROVINCIAL



- * This was the most common arrangement, although it did vary from province to province.

APPENDIX B

1980 NATIONAL CENSUS PROJECT



APPENDIX C.

QUESTIONNAIRES

- 1. Short form**
- 2. Long form**

RURAL CENSUS FORM



PROVINCE

CENSUS DIVISION

DISTRICT

CENSUS UNIT NUMBER

CENSUS UNIT NAME

OFFICE USE
ONLY

HOUSEHOLD NUMBER

CONT

TOTAL PERSONS

List all usual members of the household and visitors. Do not forget babies and old people.

Start a new page for each household.

RESIDENTS

List in this order: Head, Wife of head, Never married children of head (by age), others.

VISITORS LAST NIGHT

VILLAGE INTERVIEWS
Exclude those from other villages

PERSON NUMBER	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	WHAT IS YOUR NAME?																																																																																																			
2	WHAT IS YOUR RELATIONSHIP TO THE HEAD OF THIS HOUSEHOLD? <i>Wife, Son, Daughter, Adoptive Son etc.</i>																																																																																																			
3	WHERE DID YOU STAY YESTERDAY? <i>If stayed in this village or another village, write 'IN'. If stayed in town or non-village, write 'OUT'. If stayed in this house, etc., write 'IN'. If stayed anywhere else, write 'OUT'.</i>																																																																																																			

IF 'OUT' IN Q. 3, END OF QUESTIONS FOR THIS PERSON

4	SEX	Write 'M' for male, 'F' for female.																																																																																																			
5	WHAT IS YOUR DATE OF BIRTH?	<i>If date of birth unknown, estimate age in years.</i>																																																																																																			
6	WHAT IS YOUR CITIZENSHIP?	Write name of country, e.g. PNG, AUST, NZ, UK.																																																																																																			
7	IN WHICH PROVINCE AND DISTRICT (SUB-PROVINCE) WERE YOU BORN?	<i>For example: E.N.P. Lufa, N.I.P. Kavieng. If born outside Papua New Guinea, write country of birth.</i> PROVINCE DISTRICT (SUB-DISTRICT) or C.G.																																																																																																			
8	WHAT IS THE HIGHEST GRADE YOU FINISHED AT SCHOOL?	Write number of grades or 'NIL'.																																																																																																			
9	DO YOU GO TO COMMUNITY OR HIGH SCHOOL NOW?	Write 'YES' or 'NO'.																																																																																																			
10	LAST WEEK, WHAT DID YOU DO MOST OF THE TIME?	<i>See codes below.</i>																																																																																																			

CODES FOR QUESTION 10

01. Worked at a wage job.
02. On leave or temporarily absent from work.
03. Big or small-scale business (including unpaid helper).
04. Farming or fishing for food and money.
05. Farming or fishing, subsistence only.
06. Full-time student (incl. student on holiday).
07. Working in the house (e.g. housewife).
08. Too old or too young to work, or handicapped.
09. Other activities and looking for work.
10. Other activities and not looking for work.

11	DOES ANYONE IN THIS HOUSEHOLD <i>(Not for a wage job)</i>	Write 'YES' or 'NO'
	Grew coffee?	
	Grew tea?	
	Grew cacao?	
	Grew rubber?	
	Grew spices?	
	Raised pigs?	
	Raised cattle?	

12	IN THE LAST 12 MONTHS, DID THIS HOUSEHOLD GET ANY MONEY FROM <i>(Not from a wage job)</i>	Write 'YES' or 'NO'
	Selling things they made (Artifacts)?	
	Selling coconuts or copra?	
	Selling food crops?	
	Selling fish?	
	Running a Store?	
	Running a PMV?	
	Running a boat/canoe?	
	Any other activity (describe)?	

TOTAL THIS PAGE		THIS IS PAGE NUMBER	OF	TOTAL PAGES FOR THIS HOUSEHOLD
MALES				
FEMALES				
TOTAL				
AGES CHECKED				
INTERVIEWERS INITIALS				
CHECKED SUPERVISOR				



PROVINCE
DISTRICT/TOWN
CENSUS DIVISION
CENSUS UNIT NUMBER
CENSUS UNIT NAME

SECTION
LOT NUMBER
BUILDING NUMBER
TYPE OF HOUSE
FURTHER
IDENTIFICATION

Govt. Print.—A1517/20 000 Pads.—80

OFFICE USE ONLY	HOUSEHOLD NUMBER	CONT	V/H	TOTAL PERSONS	HOUSE TYPE

RESIDENTS										VISITORS LAST NIGHT		
Start a new page for each household										GPO: FIRE—A16177 20 000 PAGES		
List in this order: Head, Wife or head, Nearest married children of head (by age), others										Do not forget babies and old people		
PERSON NUMBER		01	02	03	04	05	06	07	08	09	10	
A	WHAT ARE THE NAMES OF THE PEOPLE WHO ARE LIVING HERE?											
1	DID YOU HAVE ANY VISITORS WHO STAYED HERE LAST NIGHT?											
B	Write down names											
2	WRITE DOWN THE RELATIONSHIP OF EACH PERSON TO THE HEAD OF THE HOUSEHOLD/FAMILY. Wife, Son, Daughter, Adopted Son, etc.	HEAD										
3	DID YOU STAY HERE LAST NIGHT?	If stayed in this house, etc. write 'IN' If stayed elsewhere else, write 'OUT'	If stayed in this village or another village, write 'IN' If stayed in town or non-village, write 'OUT'									

IF 'OUT' IN Q. 3. END OF QUESTIONS FOR THIS PERSON

[illegible]

FOR ALL FEMALES 15 YEARS OF AGE AND OLDER (BORN IN 1965 OR BEFORE)

[illegible]

FOR ALL PERSONS 10 YEARS OF AGE AND OLDER (BORN IN 1970 OR BEFORE)

[illegible]

IF CODE 01, 02, 03 or 04 IN Q. 19, ASK Q. 20, 21, 22

WHAT KIND OF WORK DO YOU DO?		WHAT DO YOU WORK FOR?		WHAT DOES YOUR COMPANY/SHOP/MAKE OR DO WHERE YOU WORK?	
20	Describe in a few words e.g. shop assistant, taxi driver, coffee grower, wood carver, ship builder, fisher.				
21	Write name of company or government department, e.g. Steamships, DPM, Dept. of Works & Supply. If self-employed, write SELF.				
22	Describe in few words, e.g. makes cups, sells hardware, transport pilot. If self-employed, write name of business.				

CODES FOR QUESTION 19

- 01 Worked at a wage job
- 02 On leave or temporarily absent from work
- 03 Big or small-scale business (including unpaid helper), e.g. PMV betel nut seller
- 04 Farming or fishing for food and money
- 05 Farming or fishing, subsistence only
- 06 Full time student (incl. student on holiday)
- 07 Working in the house (e.g. housewife)
- 08 Too old or too young to work or handicapped
- 09 Other activities and looking for work
- 10 Other activities and not looking for work

INTERVIEWER'S INITIALS

CHECKED

SUPERVISOR

23	DOES ANYONE IN THIS HOUSEHOLD <i>(Not for a wage job)</i>	Write YES or NO
	Grow cotton?	
	Grow tea?	
	Grow coconuts?	
	Grow rubber?	
	Grow spices? <i>(Use list of spices)</i>	
	Raise pigs?	
	Raise cattle?	

24	IN THE LAST 12 MONTHS DID THIS HOUSE HOLD GET ANY MONEY FROM <i>(Not from a wage job)</i>	Write "YES" or "NO"
	Selling things they made? <i>(Use list of artifacts)</i>	-
	Selling coconuts or copra?	
	Selling food crops?	
	Selling fish?	
	Running a Store?	
	Running a P.M.V?	
Running a boat canoe?		
Any other activity (describe)?		

25 URBAN AREAS ONLY

DO YOU RENT OR OWN THIS HOUSE? (*Tick box*)

☐ Rent ☐ Own

If rented WHO DO YOU RENT IT FROM?

1 Housing Commission ☐

2 Semi Govt (e.g. PNG B.C. Elcom) ☐

3 Other Govt (Prov. Local Govt. DUM) ☐

4 Others (Private, e.g. B.P's) ☐

THIS IS PAGE
NUMBER

TOTAL PAGES FOR
THIS HOUSEHOLD

TOTAL FROM Q. 5 FOR THIS PAGE	
MALES	6
FEMALES	
TOTAL PERSONS	

APPENDIX D: CALENDAR OF MAJOR CENSUS ACTIVITIES

PAPUA NEW GUINEA 1980 CENSUS

[illegible]

APPENDIX E. MAP OF PAPUA NEW GUINEA

