Development Policy Centre

Interhousehold transfers in urban PNG: a study from the 1980s

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Version: 30 January 2023

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The household tables

Note: Tables H1 to H6 (referred to in this report as 'the household tables') are contained in a separate electronic file provided with this report. See Appendix I for further information on the tables.

Acknowledgements

Abbreviations and acronyms

AE   Adult Equivalent(s)

AME   Adult Male Equivalent(s)

ANOVA   analysis of variance (test)

BOS   Bureau of Statistics, Government of Papua New Guinea

CPI   Consumer Price Index

FPL   Food Poverty Line

HES   Household Expenditure Survey 1975–76 (Bureau of Statistics, 1977)

HSD   honestly significant difference (test)

IASER   Papua New Guinea Institute of Applied Social and Economic Research

IDRC   International Development Research Centre of Canada

K   kina

kcal   kilocalories, where 1000 calories = 1 kcal, the official usage in 1982–83

LPL   Lower Poverty Line

n/a   not applicable

NCO   National Census Office, Government of Papua New Guinea

NSO   National Statistical Office, Government of Papua New Guinea

PNG   Papua New Guinea

t   toea

UPL   Upper Poverty Line

WHO   World Health Organization

Definitions of key terms

Location of main discussion of term given in brackets.

Adult Equivalent(s)

A measure of the consumption requirements of a person in a household based on the calories they required as determined by their age. The measure is expressed in relation to the requirements of an adult where all persons aged over 6 years are counted as adults and those aged 0 to 6 years are counted as 0.5 of an adult. (Chapter 8)

Adult Male Equivalent(s)

A measure of the consumption requirements of a person in a household based on the food they required as determined by their age and sex and whether or not, if female, they were pregnant or lactating. The measure is expressed in relation to the requirements of an adult male, defined as a male 20 years and over, for whom the food consumption requirements are counted as 1. (Appendix II)

Cash transfers

Transfers to and from households in the form of cash. (Chapter 5)

Casual employment

Employment on a one-off basis, for some hours, some days, or some weeks but with no commitment to ongoing employment. (Chapter 4)

Consumption

Used to mean net consumption. (Chapter 7)

Consumption survey

The two-week daily household income and expenditure survey conducted during the study in each of the four low-income census units (a sample of 48 households) and the high-income census unit (a sample of 11 households). (Chapter 2)

Disposable income

Total income available to a household, being the sum of earned income and net transfers. (Chapter 6)

Earned income

Income earned by a household, being the sum of employment income, informal sector income and subsistence income. (Chapter 4)

Employment income

Income in cash or kind earned by a household from the sale of labour services, including both income from wage employment and from casual employment. (Chapter 4)

Food consumption

Used to mean net food consumption. (Chapter 7)

Food Poverty Line

The cost of a food consumption basket which meets a minimum food-energy requirement of 2,200 calories per AE per day and reflects the dietary pattern of lower income groups. (Appendix II)

Gross consumption

The value of goods and services available to the normal residents of a household for consumption before outwards transfers. Gross consumption is the sum of the value of opening stock, income in kind, transfers in kind received, meals received, overnight hospitality received, subsistence production, and goods and services purchased for cash. (Chapter 7)

Household survey

The one-off survey of all households covering basic demographic and economic data in each of the four low-income census units (415 households) and the high-income census unit (26 households). (Chapter 2)

Household tables

Tables H1 to H6 giving data on 42 variables from the consumption surveys for individual study households. The tables are provided in Excel spreadsheet format in a separate electronic file provided with this report. (Appendix I)

Income in kind

Income received in kind rather than cash from either employment or informal sector activity. (Chapter 4)

Informal sector income

Net income in cash or kind from enterprises (however small and informal) operated by the household, with such enterprises operating in the market economy. (Chapter 4)

Inwards transfers

The sum of transfers received by a household in the form of cash transfers, transfers in kind, meals received, and overnight hospitality received. (Chapter 5)

Lower Poverty Line

The cost of the food consumption basket included in the Food Poverty Line supplemented by an allowance for non-food consumption based on the value of non-food consumption per AE in those households where consumption per AE was equal to the Food Poverty Line. (Chapter 8)

Net consumption

The value of goods and services consumed by the normal residents of a household. Net consumption is the sum of the value of opening stock, income in kind, transfers in kind received, meals received, overnight hospitality received, subsistence production, and goods and services purchased for cash LESS the value of outwards transfers in kind, meals given, overnight hospitality given and closing stock. (Chapter 7)

Net food consumption

The food consumed by the normal residents of a household. Net food consumption is the sum of the value of food items in opening stock, income in kind, transfers in kind received, meals received, subsistence production, and goods and services purchased for cash LESS the value of food items in outwards transfers in kind, meals given, and closing stock. (Chapter 7)

Net transfers

The value of inwards minus outwards transfers for a household. Net transfers can be a positive or a negative value. (Chapter 5)

Normal resident

A person who usually lived in a household or had stayed or expected to stay in a household three months or longer. (Appendix II)

Outwards transfers

The sum of transfers given by a household in the form of cash transfers, transfers in kind, meals given, and overnight hospitality given. (Chapter 5)

Upper Poverty Line

The cost of the food consumption basket included in the Food Poverty Line supplemented by an allowance for non-food consumption based on the value of non-food consumption per AE in those households where food consumption per AE was equal to the Food Poverty Line. (Chapter 8)

Visitor

A person who either ate a meal or stayed overnight in a household where they were not a normal resident. A visitor included a person who had been staying in a household other than their own for less than three months. (Appendix II)

Wage employment

Employment in an ongoing wage job. If a person was on leave or temporarily absent from a wage job, they were still considered to be in wage employment. Casual employment is not included in wage employment. (Chapter 4)

Executive summary

The 1982–83 study reported here is one of only a handful of studies primarily designed to quantify interhousehold transfers in urban Papua New Guinea. The main alternative sources of quantitative information on transfers are the four large-scale household income and expenditure surveys conducted in 1975–76, 1987–88, 1996 and 2009–10 (see Bureau of Statistics, 1977; Gibson, 1998; World Bank, 2000; and National Statistical Office, n.d.).

This study can be set alongside the large-scale household income and expenditure surveys to provide more fine-grained information on how and why transfers flow and their impact on consumption and poverty. The relevance of the study today is not the kina value of transfers, but the description of transfers and the relationships between transfers and other household and community characteristics.

The study adds to what is known from the large-scale household income and expenditure surveys by focussing on four low-income census units (three settlements and one traditional village in two urban areas) and by including some of the poorest urban households. The field methods were designed to capture transfers in more detail than larger surveys could. Unlike other surveys, the study included meals given and received and overnight hospitality in the definition of transfers. The study also recorded for the donor or recipient of every transfer the relationship to the study household, the birthplace, and place of residence.

The main data collection methods were demographic and economic surveys of all 415 households (2,548 residents) in the four low-income study areas, and two-week income and consumption surveys of a sample of 48 households (295 residents) within those areas.

Although initial findings from the study were issued at the time (Morauta, 1983a and 1984a), the full data and analysis were not published. The purpose of this report is to place a fuller set of data, including data by household for all consumption survey sample households, and a more complete analysis in the public domain.

The analysis of the data in this report mainly follows the original design. However, in two areas, the definition of adequate calorie and protein consumption and the development of poverty lines, the analysis draws on studies since the 1980s,

particularly the World Bank poverty assessments (World Bank 2000 and 2004) and the work of Gibson (1998, 2000, 2012, and Gibson et al., 2010).

There were a number of key findings:

- The study identified higher levels of transfers than other studies.
- Meals and overnight hospitality were particularly significant in outwards transfers, where they increased the value of outwards transfers that would otherwise have been recorded during the two-week consumption surveys by two thirds.
- Around half of all transfers recorded by value were transfers in kind, meals, or overnight hospitality.
- The large majority of transfers in the four low-income areas were between urban residents rather than between urban and rural residents.
- The effect of transfers was to raise consumption in net recipient households in the study by nearly one half and in the lowest quartile of households by 61 per cent.
- The effect of the transfers system was to lower consumption in net donor households by up to one fifth.
- Partly as a result of the transfers system, there were relatively low levels of inequality in the value of consumption in the four study areas, particularly in food consumption.
- Despite the high level of transfers recorded in the study, an estimated 41 per cent of households in the four low-income study areas received less than 100 per cent of their nutritional requirements in relation to both calories and protein.
- An estimated 9 per cent of households in the four low-income study areas fell below the Food Poverty Line developed for the study and 17 per cent below the Upper Poverty Line.

The study shows that if transfers are under-reported in urban studies, consumption in net recipient households will be underestimated and in net donor households it will be overestimated. This will in turn distort the picture of the distribution of consumption between households and affect the levels of poverty identified.

Chapter 1: The study

Aims of the study

The study was designed to provide a description of the nature, extent, and effects of interhousehold transfers in urban Papua New Guinea (PNG). Subsidiary objectives were to describe any redistributive effects of transfers, including for poorer households, and the logic behind interhousehold transfers. To do this, the study needed to collect information on:

- incomes earned by households, through employment, the informal sector and subsistence production;
- the value and incidence of transfers (with transfers in cash, transfers in kind, meals given and received, and overnight hospitality given and received included in the definition of transfers);
- who was giving and who was receiving transfers; and
- the resulting levels of food and other consumption.

The study was designed as an applied research project aiming to provide data to inform government policy on urban poverty and related areas such as wages, the informal sector, access to land, urban settlement, and urban services.

The study was partly funded by the International Development Research Centre of Canada (IDRC) and hosted by the PNG Institute of Applied Social and Economic Research (IASER), now the PNG National Research Institute. IASER also made a financial contribution and the Government of PNG contributed computing services free of charge.

The study took place in 1982 and 1983 in three settlements and a traditional village in the urban areas of Port Moresby and Madang. These four areas were selected because they had a high proportion of households without wage-earners and were likely to contain some of the poorest urban households. They are collectively described as the low-income areas in this report. The main data collection methods were demographic and economic surveys of all 415 households (2,548 residents) in these four areas, and two-week income and consumption surveys of a sample of 48 households (295 residents).

For comparative purposes, a parallel study using the same methods was made of a high-income census unit in Port Moresby, where there were 29 citizen households

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(171 residents), and 11 households (65 residents) in the income and consumption survey sample.

The gaps in information at the time of the study

At the time of the study, there was little information available about the incomes and living standards of the poorest urban households in PNG. There were no definitions of urban poverty, nor had any poverty lines been developed. The role of transfers in the income and consumption of poorer households was not well understood. The two main sources of information on income, consumption and transfers were national surveys and local case studies. Each had drawbacks.

Urban surveys in PNG to that time, being few and far between, had concentrated on gathering data across the urban population as a whole. The three national censuses in 1966, 1971 and 1980 attempted 100 per cent coverage of urban areas and provided information on the economic activity of all persons and certain economic characteristics of households. Quantitative data on incomes, almost entirely incomes from employment, were available from the 1973–74 Urban Household Survey, conducted with local academic and overseas research funds (Garnaut et al., 1977) and the 1977 Urban Population Survey (Bureau of Statistics [BOS], 1978 and 1980a).

The PNG government had undertaken two household income and expenditure surveys which were more likely to produce data on non-wage income, consumption, and transfers. The first was narrowly focussed on Papua New Guinean public servants in July 1970 (Department of Labour, 1971). In 1975–76 the BOS conducted the first urban Household Expenditure Survey (HES) in a random sample of 585 Papua New Guinean households in six urban areas. The aim of the survey was to update the basket of goods in the Consumer Price Index (CPI). The BOS considered that the data obtained on interhousehold transfers probably underestimated them because of the difficulties of obtaining such data (BOS, 1977, Bulletin 1, p. 47). The main drawback of these national surveys was the difficulty they had in establishing non-wage income, including subsistence income, and transfers.

The other main sources of data on urban household income and consumption at the time of the study were quantitative findings for small samples, usually in studies of single ethnic or local groups. In the 1950s there was a study in Hanuabada, Port Moresby (Belshaw, 1957), and later studies included an urban village in Rabaul in the 1960s (Epstein, 1969), mixed ethnic communities in Port

Moresby in the 1960s (Hitchcock & Oram, 1967 and Oeser, 1969), and in the 1970s a small highlands sample in Port Moresby (Strathern, 1975) and two small Lae samples (Jeffries, 1978 and Christie, 1980). These small-scale studies often provided better quality data on non-wage income, including transfers, and more background on the social context of transfers. However, they were often not focussed on the poorest urban households. Furthermore, it was often not easy to place the households studied in the context of their own community or the wider urban economy.

Key features of the study

The current study was designed to address the gap between these two types of study by using the quantitative methods of household income and expenditure surveys with a number of refinements, by focussing on the poorest households and poorer communities, and by being able to trace the relationship between the study areas and the wider urban community by reference to the 1980 census.

A number of features distinguish the study from other household income and expenditure studies, including as it turns out, those that have followed this study:

- The sample of households for the consumption surveys was designed to include some of the poorest households in the study areas, a group often missed in other studies.
- In the consumption surveys, the two field team members each visited every sample household for around 30 minutes in the later part of the afternoon for 15 days and recorded all diary information for the study. Scales were used to weigh unpacked food items. This produced very detailed information on transfers in kind and subsistence production which are often difficult to record.
- For every transfer to each sample household, information was recorded on the relationship of the donor or recipient to the household, where the donor or recipient lived and where the donor or recipient was born.
- The value of meals given and received and of overnight hospitality given and received were included in total transfers, where these items are not usually included in data on transfers.
- The method for valuing meals and overnight hospitality depended on the collection of data each day on the number of meals eaten in a household, the number of meals eaten by visitors and the number of meals eaten away by normal residents. Similarly, overnight absences and visits were recorded for each household for each day.

- The remainder of the method for putting a value on meals and overnight hospitality took place at the analysis stage when figures were developed for levels of food and other consumption in each household.
- Meals and overnight hospitality were particularly significant in outwards transfers, where they increased the value of outwards transfers that would otherwise have been recorded during the two-week consumption surveys by two thirds.
- Around half of all transfers recorded by value were transfers in kind, meals, or overnight hospitality.
- The value of transfers recorded was higher in relation to income and consumption than in other studies, most likely because of the methods and the definition of transfers used and also perhaps because of the focus on areas where there were many poor households.

Initial findings

A preliminary paper on the Madang field work (Morauta, 1983a) and a summary of the project findings were issued shortly after work was completed (Morauta, 1984a). The 1984 paper described income, transfers, and consumption in households with and without wage-earners. It showed that some households had inadequate food, despite the active transfers system.

A number of suggestions were made to improve the circumstances of poorer people living in urban areas. These included recommendations on primary schools, land for gardening, simpler methods to establish plot ownership in settlements, water supply and street lighting.

Unfortunately, a full report on the project could not be completed at the time of the study. There were delays in completing the analysis because of ill health in the team and then project funding and time ran out.

The current report

I had always hoped that there would come a time when I could write the project up fully. This time did not come until 40 years later when I was fully retired. It has taken many months to remind myself how the study was conducted and to reacquaint myself with the material. Much credit is due to Linda Newell's fine record-keeping. A few chapters, such as the Chapter 3 description of the study areas, had already been sketched out. But the presentation and analysis of the data has now been completed.

The purpose of this report is to place in the public domain detailed material from the study which has not been published elsewhere. Accompanying the report in a separate electronic file are data tables by household which would enable other researchers to interrogate the data for their own purposes (see Appendix I for details).

This report has been compiled from hard copy written records of the study that I had kept. No study records were in electronic form. Some project materials were not retained, including bulky computer printouts, original survey materials and a considerable amount of initial household data. This has led to a few gaps in the information available for this report.

The analysis provided is mainly in the terms of the study as it was designed. But the report includes an updated approach to the measurement of calorie and protein adequacy, and the development of poverty lines for the study areas. These enable comparison of the study data with other available data. For these purposes, the analysis draws on the World Bank poverty assessments for PNG (World Bank, 2000 and 2004) and work by Professor John Gibson of Waikato University (Gibson, 1998, 2000, 2012, and Gibson et al., 1998 and 2010).

The changing context

Much has changed in PNG urban areas since 1982–83:

- The urban citizen population has grown from 366,000 in the 1980 census to 903,000 in the 2011 census, although still around 12 per cent of the total citizen population in both years (National Statistical Office [NSO], 2015, pp. 12–13).
- Urban citizen wage job employment rates have fallen considerably between 1980 (86 per cent) and 2011 (53 per cent) (NSO, 2015, p. 61).
- Urban migration patterns have been changing. The single largest source of urban migrants in 1990 and 2000 was the Central Province. In 2011 it was the Chimbu Province (NSO, 2015, p. 37).
- Between 2000 and 2011 the proportion of the urban population who were migrants dropped from 60 per cent to 40 per cent (NSO, 2015, p. 37) as people settled and raised families in urban areas.
- The dependency ratio (the number of people aged 0 to 14 and 65 years and over divided by the number of people aged 15 to 64 multiplied by 100) has been falling in urban areas from 69 in 1980 to 54 in 2011 (NSO, 2015, p. 13), as the proportion of children fell.

- Poverty in PNG as a whole did not decline between 1996 and 2009–10. In the National Capital District there was an increase in poverty over that period (Gibson, 2013, pp. 29 and 36).

This report does not comment on the changes that have taken place since the early 1980s. It leaves to those more familiar with current circumstances the consideration of the impact these changes may have had on transfers in PNG urban areas.

Since 1982–83 more studies have been undertaken which look at urban incomes, consumption, and transfers in one way or another:

- Household income and expenditure surveys have been undertaken in urban areas in 1987–88 (Gibson, 1998 and Gibson et al., 2010), 1996 (World Bank, 2000), and 2009–10 (NSO, n.d.).
- Based on these surveys, poverty assessments have been made for 1996 (World Bank, 2000 and 2004), and 2009–10 (Gibson, 2012 and Gibson, 2013).
- There have also been a number of smaller scale studies which addressed income, consumption and transfers in different ways including Barber (2003), Gibson et al. (1998), Hukula (2017), Iamo (2007), Monsell-Davis (1993), Rooney (2017), and Umezaki & Ohtsuka (2003).

Some references are made to the findings of these more recent studies in this report.

The study team

The study team consisted of four members, including myself, appointed to the staff of IASER and funded by the IDRC. The contribution of project team members at IASER to the study was as follows:

- Linda Newell was co-designer of the quantitative methodology and managed the quantitative analysis, including all arrangements with the National Computer Centre.
- Lazarus Masavi worked with Linda on the quantitative methodology and analysis, taking responsibility for certain elements. Lazarus was also involved in field pricing surveys.
- John Kambu undertook more than half of all data collection in the field, doing half of all interviews in the four low-income areas and all surveys and interviews in the high-income area.

My role was project director, with responsibility for conceptualisation, overall design of methodology and data analysis and writing up of the project. I was also involved in data collection, undertaking half of all interviews in the low-income areas. All members of the team contributed to conceptualisation, and the design of the methodology and analysis of data from the project. I am solely responsible for the writing of this report.

Chapter 2: Design and methods

Study design

The major methodological problem for this study was to conduct the fine-grained micro-research necessary to provide the type of information required, and at the same time to know something about the relationship between the micro-study and the wider urban population. As a result, the study was designed in several stages:

- *Analysis of the 1980 census.* The locations of urban citizen households without wage-earners in all urban areas were identified through special tabulations prepared by the National Census Office (NCO). These tabulations identified the location of 56,912 households according to the number of wage-earners in each household and the census unit (the smallest locational grouping in the census).

- *Selection of study census units.* Based on the 1980 census information on the location of households without wage-earners, four census units were selected for the study, where there was a high incidence of households without wage-earners. This was to ensure that the study captured some of the poorest urban households. In this report these four census units are referred to as the low-income areas, or low-income census units. A single high-income census unit was also selected for comparison.

- *The household surveys.* Surveys were conducted on the social and economic characteristics of all households in the five selected census units. These surveys covered all 415 households in the low-income census units, and 26 out of 29 citizen households in the high-income census unit.

- *Selection of consumption survey sample.* Using information from the household surveys, a sample of 48 households was selected across the four low-income census units for the consumption surveys. Two strata of equal size were selected in each census unit, households with and without wage-earners. A further sample of 11 households was selected from the high-income census unit.

- *The consumption surveys.* Detailed diary-based income and consumption surveys (called the consumption surveys in this report) were undertaken over two weeks in the sample of 48 households in the four low-income census units and in the 11 households in the high-income census unit.

- *Data analysis.* Data analysis developed summary data to address the main areas of enquiry from the two surveys. The analysis included estimates for the four low-income census units as a whole, and updated approaches drawing on more recent studies of calorie and protein adequacy and poverty.

This chapter describes these six stages of the design in more detail. Further information on some of the methods described, where indicated, can be found in Appendix II.

Field work

The project ran from August 1982 to December 1983 with analysis also taking place in the first part of 1984. The field team spent between three and six weeks in each census unit, beginning with introductory and background discussions, moving on to mapping and the household survey, and spending just over two weeks on the consumption survey. The household and consumption surveys were spread through the period from 8 November 1982 to 3 August 1983 (Table 1).

Table 1: Dates of household and consumption surveys in each location

Location	Household survey	Consumption survey
Nine Mile	8–10 November 1982	2–15 November 1982
Gordons Ridge	21 January – 23 February 1983	8–21 March 1983
Gerehu	28 April – 11 May 1983	17–30 May, 7–20 June, 8–21 June 1983
Biliau	27–28 June 1983	30 June – 13 July 1983
Wagol	18–19 July 1983	21 July – 3 August 1983

The field work team, John Kambu and I, lived on site in two of the census units and visited for several hours a day in the other three. Most commonly the language used was Pidgin, but English was used in the high-income census unit in Gerehu, and I spoke Toaripi (the language used in the Malalaua District of the Gulf Province) in Nine Mile, one of the low-income census units. Field assistants were employed from each low-income census unit and helped if language problems arose.

Focus on the household

The household was selected as the central economic unit in the study. The main alternative would have been the individual urban resident. If the study had been about earned income, a focus on the individual income-earner would have been appropriate since in urban areas most income accrues to individuals in the form of wages or other cash returns to individual labour. However, in a study looking at consumption and nutrition as well as income, the unit of analysis needed to be different.

The HES defined a household as a group of persons who ate most meals together and had a common food supply (BOS, 1977, Bulletin 1, p. 4). The 1980 census defined a household in urban areas as those persons who spent the night previous to the day of enumeration in a single dwelling (NSO, 1985, p. 3). The HES definition was used in this study.

Analysis of the 1980 census

The 1980 census provided a national framework for the study. The census question of interest was the one asked about all persons in urban areas (except students in boarding institutions, detainees, and hospital patients): "Last week, what did you do most of the time?" The answers to this question included information on whether a person was working at a wage job or on leave or temporarily absent from a wage job and identified other economic activities.

The NCO provided special tabulations for this study showing the number of wage-earners per citizen household in all urban areas of PNG. These have been previously reported (Morauta, 1983b).

For this purpose, a household with a wage-earner was defined as a household where for one or more persons in the household the answer to the census question about what they did most of the time last week was coded as being either:

- 01 Worked at a wage job; or
- 02 On leave or temporarily absent from work.

This definition of wage-earner was adopted in this study. The definition implies that those coded 02 were absent from a wage job, suggesting some level of continuity in the job. It excludes those who found one-off casual employment for some hours, some days or even some weeks but with no continuity in the work. In this study, there were some households classified as households with wage-

earners as well as households without wage-earners which had income from casual employment.

In the 1980 census, 86 per cent of all urban citizen households had at least one wage-earner and 36 per cent had more than one. Of all households, 14 per cent or 7,740 households had no wage-earner.

The census showed that urban households without wage-earners were concentrated in certain types of location. The highest proportion of households without wage-earners (43 per cent) was to be found in urban census units classified as traditional villages. In census units classified as settlements, 22 per cent of households were without wage-earners. In all other types of census unit, the proportion of households without wage-earners was less than 10 per cent.

In the eight largest urban areas in 1980, the proportion of households without wage-earners ranged from 3 per cent in Kieta-Arawa-Panguna, to 37 per cent in Goroka where the urban boundaries had been drawn well into surrounding rural areas. The average proportion of households without wage-earners in these eight urban areas was 12 per cent.

Selection of study census units

The special census tabulations also provided data by census unit, the smallest identifiable unit in the census. This study used the proportion of households without a wage-earner by census unit as a way of finding poor areas and the poorest households. There was no assumption that all households without wage-earners would be poor. Rather the assumption was that many of the poorest households would be found within this group.

The decision about how many census units to select rested on a judgement about how many households the field team of two could manage at one time in the consumption surveys, and how much time there was available for the study. From experience with a previous rural household consumption study (Morauta 1984b), it was known that two field workers could each cover six households in the consumption survey, a total of 12 households at any one time. This allowed a field worker to visit each household in the late afternoon or early evening on every day for around 30 minutes or as required. This was a key data quality measure. Given the resources available, the decision was taken to select four low-income census units for the main part of the study. With a sample of 12 households from each, this would give a sample of 48 households in the four low-income census units. One high-income census unit was to be added for comparison. For the high-income

census unit, there were to be 12 households for the consumption survey. These were to be spread over different two-week periods to enable a single field worker to cover this group.

Field work was limited to two urban areas so that there were two low-income census units to compare within each, and to use resources efficiently. Port Moresby and Madang were selected where 7 per cent and 21 per cent of citizen households respectively were without wage-earners. In Port Moresby 27 per cent of households lived in census units classified as traditional villages and settlements, while in Madang the proportion was 49 per cent. Port Moresby had the highest and Madang the lowest food prices of the five urban areas in the BOS lowest foodcost study (BOS, 1980b, Appendix Table 4).

The selection of Port Moresby and Madang was largely based on practical considerations. In Port Moresby the team had an office at IASER where two members were based. In Port Moresby, there was also IASER transport, access to the office-based team members and access to home accommodation where the field work team was not going to live in at the selected locations. Madang was chosen as a contrast in terms of the proportion of householders without wage-earners, the rural origins of urban residents and living costs. I also had previous research experience relevant to some parts of the population of Port Moresby and Madang. I had 19 months of field work in the immediate hinterland of Madang in 1968 and 1969 (Morauta, 1974) and had conducted a study of the impact of migration to Port Moresby on a rural Gulf Province community (Morauta, 1984b).

The selection of low-income census units was restricted to units classified as traditional villages and settlements since the 1980 census had shown that these two types of census unit were where households without wage-earners were concentrated. The census also showed that of all households without wage-earners, about one quarter (27 per cent) were in traditional villages. As a result, three census units that were classified as settlements and one that was classified as a traditional village were selected. Because neither of the two field workers spoke Motu, the language used in traditional villages in Port Moresby, a traditional village in Madang was selected where Pidgin was used.

The initial selection criteria for census units in Port Moresby and Madang using 1980 census data were:

• two settlements in Port Moresby and one settlement and one traditional village in Madang;

- a minimum of 50 households in Port Moresby and 40 in Madang (to enable a household survey and then a sample of 12 households to be drawn); and
- the highest possible proportion of households without wage-earners consistent with the other criteria.

In Port Moresby these criteria produced a list of 12 census units classified as settlements in the top decile of census units with the highest proportion of households without wage-earners. The team visited all 12 and formed a general impression of their social and cultural characteristics.

Two census units typical of two different types of settlement were selected: one long-established and one much more recently grown to its current size. Nine Mile settlement (census unit 88.415) was selected from among the long-established communities of migrants (in this case from the Gulf Province) and Gordons Ridge (census unit 83.57) from among the more rapidly growing settlements of migrants mainly from the highlands provinces. The choice of Nine Mile was influenced by the fact that it was mainly occupied by people from my husband's rural village of Kukipi. I had good contacts there and had previously conducted a parallel study in the rural village. Gordons Ridge was a settlement in which the initial contacts were more positive than in two equally eligible settlements where people from the highlands provinces were in the majority.

In Madang in 1980 the urban boundary for census purposes fell outside the town boundary. Census units outside the town boundary with a largely rural lifestyle (census units with 600 numbers) were excluded from the selection. The traditional village and the settlement census units with the highest proportion of households without wage-earners were then selected. These were the Wagol Settlement, otherwise known as the Sepik/Bogia settlement (census unit 81.15), situated on the edges of the central urban area, well within the town boundary and Biliau, a traditional village (census unit 81.111), even more centrally located.

The study design included a parallel study of a high-income census unit. This was necessary because directly comparable data to the consumption surveys were not available for other types of urban areas. A census unit classified as high covenant (containing the most expensive type of housing) rather than a low/mixed covenant census unit was selected as likely to present more of a contrast. Since John Kambu was living on campus at IASER and was to do all the field work in the high covenant area, a census unit in the nearby suburb of Gerehu was selected for convenience. The 1980 census data on census units in Gerehu classified as high covenant were examined. One census unit in which the distribution of wage-

earners between citizen households was typical of all units was selected. The census unit selected for study (census unit 80.02) consisted of 34 houses on two separate streets. Of the 34, five were occupied by non-citizen households (where the household head was a non-citizen) and were excluded from the study, leaving a total of 29 citizen households.

There was no statistical relationship between the four low-income census units and the wider urban environment, or the subset of that environment comprised of traditional villages and settlements. Indeed, the four census units were partly selected on the basis that they had atypically high levels of households without wage-earners compared to other census units in Port Moresby and Madang.

As it turned out, however, the four census units in the study, as described in the household surveys, were very similar to traditional villages and settlements combined across PNG urban areas in the 1980 census with respect to two variables.

In relation to whether there was a wage-earner in the household, the four study census units had a similar profile to the national urban profile for settlements and villages combined. The four study census units had 27 per cent of households without wage-earners and settlements and traditional villages combined in the census had 26 per cent.

The 1980 census showed that 48 per cent of households without wage-earners in traditional villages and settlements had "no income producing activities noted". In the household surveys in this study, 48 per cent of households without wage-earners relied on transfers as their main source of cash income. These two results appear congruent.

As a result, the findings for the four census units in this study may be considered indicative of the income situation in other settlements and traditional villages in PNG urban areas at that time, but the extent of similarity on other variables has not been measured.

The household surveys

The household surveys were designed to provide an up-to-date social and economic description of the selected census units through single interviews with every household. The survey was also designed to provide the frame for sample selection for the consumption surveys.

Coverage was guided by the use of rough maps of houses which were drawn up for the purpose. For every individual in each household information was collected on sex, age, place of birth, the year they first came to town, economic activity, type of job or business and employer (where applicable), education and residential status. The questions used were those in the 1980 census (NSO, 1982, pp. 53–56). For each household as a unit, additional information was also collected on the main source of cash income and subsistence activities. Survey forms used in the household surveys are provided in Appendix III.

All 415 households were surveyed in the low-income census units, 100 in Nine Mile, 207 in Gordons Ridge, 65 in Biliau and 43 in Wagol. There was no non-response in these census units. In addition, 26 out of the 29 citizen households in the Gerehu census unit were surveyed (with three citizen Gerehu households declining to participate).

Selection of consumption survey sample

One aim in selecting the consumption survey sample in the four low-income census units was to ensure that poor households within each census unit were included. For this reason, the sample was stratified by whether households had wage-earners. There were to be six households with wage-earners and six households without wage-earners in each census unit, giving a total of 48 households in the four census units.

The second aim was to select each sample of six in each low-income census unit to be as representative as possible of the characteristics of the group of households either with or without wage-earners from which it came in the census unit as determined from the household surveys with respect to:

- province of birth;
- age of household head;
- sex of household head;
- whether the household contained female residents;
- the main source of cash income; and
- for households with wage-earners only, the number and education level of wage-earners.

For each stratum in each low-income census unit, a desired profile was constructed for the six sample households and the households which were the best fit to the profile were identified. Where there was a choice of households fitting the profile, preference was given on the basis of location within the census unit (to

make it easier to walk around the sample households in one session) and the language spoken (households where the team did not require an interpreter). Broadly speaking, the profiles were achieved.

In the high covenant census unit, there was no stratification by wage-earner status of households. Otherwise, the variables above were used in the same way as for low-income census units to select the sample. One sample household declined to continue to participate in the consumption survey after commencement, and the sample was reduced to 11 at that point. Further details on selection of the consumption survey sample are provided in Appendix II.

The distinction in the sample selection process between households with wage-earners and households without wage-earners did not work out quite as planned. Three households selected as having a wage-earner did not have any income from employment in the two weeks of the consumption surveys and one household had only K26.70 from casual work. This was a consequence of the instability of low-paid work in these areas. Four people lost their jobs between the household surveys and the commencement of the consumption surveys. To maintain the sampling structure, no adjustment was made for this loss of jobs. There was no comparable problem in the sample of households without wage-earners. They all remained without formal employment during the consumption survey periods.

The consumption surveys

The centrepiece of the project were the two-week consumption surveys conducted with the 48 sample households in the low-income study areas and with the 11 sample households in the high-income area. The consumption surveys occupied the largest part of the field work, since they involved daily visits by the team in the late afternoon or early evening to all sample households at each site over 15 days.

The field team carried scales and weighed any food items or betel nut that were not prepacked and therefore needed weighing to price. Not everything was particularly easy to weigh. There were difficulties with large freshly caught eels at Nine Mile, but a weighing method was devised with a hanging scale. The weighing was particularly important for subsistence produce, and transfers in kind both inwards and outwards. Information on a daily basis was collected on income in cash and kind, inwards and outwards transfers in cash and kind, subsistence production, cash expenditure and inwards and outwards overnight visits and meals given and received. The purpose of the in-person approach was to enable detailed questioning and measurement on site each day. In a one-off recall

interview with each sample household, information was gathered on irregular transfers and items purchased over longer periods. The survey forms used are provided in Appendix III.

The design of the consumption surveys drew heavily on the HES. The main differences were in the detailed questions on transfers and the attention to subsistence produce. For every transfer, the relationship between the recipient or donor and the study household was recorded, and the place of residence and place of birth of the recipient or donor. For visits to the household and visits of household members to other households, the same information was also recorded along with information on how many meals were eaten. Check lists were used to ensure coverage of what had happened during the day. All data were recorded by the field team. There was no requirement for households to keep their own records, although where any notes or receipts were kept these were helpful.

The process was onerous for households, but they held up well under the workload. There were no dropouts during the consumption surveys apart from the one household in Gerehu already mentioned. At the end of the study each household was offered a choice of consumer items or bags of rice as an acknowledgement of their effort.

For each census unit, surveys of local prices, including local store and market prices, were made to enable values to be attached to subsistence produce and transfers in kind. These supplemented items that were priced in the official CPI surveys for Port Moresby and Madang at relevant dates. For each location, 42 standard food items were priced, of which between 29 and 31 were priced using CPI data and the balance were priced from study surveys. Pricing surveys for the two Madang census units were conducted only once because field work was conducted in a single block of time. Pricing surveys for Nine Mile and Gordons Ridge were undertaken at different times to coincide with the field work in those areas. Prices were also calculated for standard transfers such as one cup of sugar and one small dish of uncooked rice as well as non-food items in common use, particularly firewood and betel nut.

Data analysis

Variables by household

Data from the consumption survey were recorded as individual transaction records where each record was distinguished from others by the nature of the item produced, transferred, or purchased, the type of transaction, and some additional

details for all transfers. These were then assembled into aggregate records for two weeks for each household. The values for all variables in this report refer to the two-week period of the consumption surveys rather than being presented on an annual basis. This was the approach adopted in the HES.

The variables by household constructed and used in this report include:

- income variables including earned income (from employment, the informal sector, and the subsistence sector), net transfers, and disposable income (columns H to M in the household tables);
- transfers variables including inwards and outwards transfers in cash, kind, meals, and overnight hospitality (columns N to X in the household tables);
- consumption variables including gross, net, and net food consumption and the components of these (columns Y to AF in the household tables); and
- adequacy of consumption variables including the per cent of calories and grams of protein required that were consumed and the per cent of the value of poverty lines that were consumed (columns AG to AP in the household tables).

How each of these variables was constructed from the data collected is described in Appendix I and Appendix II.

Adult Male Equivalents

Much of the analysis depended on the use of Adult Male Equivalents (AME) per household. Household size varied between study areas and between sub-groups of the sample. For example, households in Nine Mile were larger on average than households in Gordons Ridge (eight compared to five persons per household). Comparisons between groups on income and consumption variables therefore had to be expressed per AME, if household size were not to distort comparisons.

Instead of a per capita measure, AME were used that reflected the different food consumption requirements of household members (for example, the requirements of adult males, adult females, and children of different ages). The AME measures used were based on the man-unit food equivalent values developed by the BOS for the lowest foodcost study (BOS, 1980b, p. 7). A table of these values (Table 34) is included in Appendix II. Where AME are referred to in this report the reference is to AME for normal residents of each household unless otherwise noted.

In chapters 8 and 9, study AME are converted to Adult Equivalents (AE) so that study data can be compared to other studies on food adequacy and poverty. AE are used in the construction of poverty lines.

Analysis by groups of households

In line with the sample design the main grouping of the 48 sample households used in the analysis was households with and without wage-earners, with 24 households in each group across the four low-income areas. Comparisons between these two groups are tested for significance in this report. The study design enabled estimates to be made for the four low-income census units as a whole (see section below on adjusting for sampling fractions). For comparison, the households in Gerehu, the high covenant area, are included in many tables in the report.

To add to an understanding of the data, analysis was also provided on three other groups within the 48 sample households in the four low-income areas: the lowest quartile, net donor households and net recipient households. These three groupings each contained households with and without wage-earners.

The lowest (poorest) quartile of households (12 of the 48 sample households in the low-income areas) was identified in terms of net consumption per AME, the basis for the BOS ranking of households to identify the "poorest urban tenth" (BOS, 1979, p. 2). Because net consumption per AME was calculated in local prices for each household and to take account of the price differences between Madang and Port Moresby, the lowest quartile was constructed with equal numbers (six) from Madang and Port Moresby. If this had not been done, 11 of the 12 lowest quartile households would have been in Madang. The lowest quartile of study households cannot be used to describe the lowest quartile in the four low-income census units as a whole because the statistical relationship between the 12 households that emerged from our surveys and the lowest quartile in the total population is not known. The importance of the lowest quartile analysis is to provide a description and understanding of the poorest households in the Port Moresby and Madang study samples for comparison with other groups of households.

Another grouping of the 48 low-income sample households used in the analysis was defined in terms of net transfers. The differences were considered between the 18 net donor and the 30 net recipient households (see Chapter 5). This distinction was not part of the study sample design, but a product of the data collected on transfers. The data on net donor and net recipient households cannot be used to describe net donor and net recipient households in the four low-income census units as a whole because the statistical relationship between the two groups of households that emerged from our surveys and net donor and net recipient households in the total population is not known.

For each of the groups of households described here, data are presented by household in the household tables provided with this report in a separate electronic file as follows:

- Table H1: Data by household over two weeks, households with wage-earners;
- Table H2: Data by household over two weeks, households without wage-earners;
- Table H3: Data by household over two weeks, Gerehu households;
- Table H4: Data by household over two weeks, lowest quartile households;
- Table H5: Data by household over two weeks, net donor households; and
- Table H6: Data by household over two weeks, net recipient households.

With the exception of the Gerehu data in Table H3, the tables are not mutually exclusive. Every low-income area household appears in at least two tables and those in the lowest quartile appear in three.

Price differences between study areas

In the March quarter 1983, the difference in prices across all CPI groups showed Madang prices were 89 per cent of Port Moresby prices (calculated from NSO, 1983, p. 7). The main difference in prices lay in the fresh fruit and vegetables sub-group (with a weighting of only 7 per cent in the CPI) (BOS, n.d., p. 3). For this sub-group, prices in Madang were about half those in Port Moresby. Over the course of field work the CPI in Port Moresby rose by 6 per cent and in Madang by 3 per cent (NSO, 1983, p. 8).

When the poverty lines were developed in this study (see Chapter 8), living costs expressed in kina for the low-income sample households in Port Moresby were found to be roughly double those in Madang. The difference from the CPI arose because of the difference in patterns of consumption in study households compared to those of the average urban citizen wage-earning household which were reflected in the construction of the CPI. For example, food accounted for 66 per cent of consumption in the 48 study households and 84 per cent of consumption in the lowest quartile, compared to 41 per cent in the CPI households (BOS, n.d., p. 3).

Treatment of price differences between study areas

The treatment of price differences between study areas varied depending on which of the four types of variable set out below was involved.

1. *Variables denominated in kina set at local prices at the time of field work and subject to price differences between study areas.* A number of variables expressed in kina in the income, transfers and consumption analysis were of this type.

   This type of variable played two roles in the study. First, the kina values were used to construct variables of the third type discussed below, variables not denominated in kina and independent of price differences between study areas.

   Second, the kina values were themselves used in the analysis in some circumstances. Where this happened, the kina values for each household were simply added together across study areas to describe, for example, mean disposable income per AME for households with and households without wage-earners over two weeks.

   Because the sample design was six households with wage-earners and six households without wage-earners in each of the four low-income locations, and there were two locations in each of Port Moresby and Madang, the kina values summed across locations within each of these two groups (households with wage-earners and households without wage-earners) lay between the values for the locations in Port Moresby and in Madang and could be compared across the two groups.

   The lowest quartile group was deliberately constructed in the same way with equal numbers of households (six) in Port Moresby and Madang. Kina values for the lowest quartile could thus reasonably be compared with kina values for households with and without wage-earners.

   There were some cases where the only data retained at the time of writing this report were for all 48 sample households, 24 from Port Moresby and 24 from Madang. While kina values are provided in these cases for the 48 households as a group, it is the patterns in the data which are more important than the absolute kina values.

   The groups of net donor and net recipient households were the outcome of the data on net transfers, and unlike the other groups just discussed, these two

groups did not have equal numbers of households in Port Moresby and in Madang. There were 11 net donor households from Port Moresby and seven from Madang. Among net recipient households, there were 13 households from Port Moresby and 17 from Madang. As a result, kina values set at local prices for these two groups cannot be compared with each other or with the kina values for other groups of households. This is noted where relevant in tables giving kina values. No significance tests are provided on differences between kina values for net donor and net recipient households.

Kina values set at local prices for the Gerehu sample are at Port Moresby prices and are not therefore comparable with kina values for households with and without wage-earners and the lowest quartile households, which combine Port Moresby and Madang prices. This point is noted where relevant in the text.

Generally, tables and data are not presented by study area on this first type of variable. Significance tests of differences among the four study areas could not be run on these variables because of the confounding price differences.

2. *Variables denominated in kina but not subject to price differences between study areas.* There was only one variable of this type: employment income. At the time of the study both Port Moresby and Madang were designated as Level 1 centres and had the same urban minimum wage. Comparisons between locations on this variable were possible using the one-way ANOVA (analysis of variance) test to establish the significance of differences between the four locations.

3. *Variables that were not denominated in kina and were independent of price differences between study areas.* There were a number of important variables of this type, largely related to the relationship between kina values for different variables within a household. These included the ratios of net transfers to disposable income, transfers to consumption and food consumption, and subsistence production to disposable income. Comparisons between study areas on this type of variable were possible using the one-way ANOVA test to establish the significance of differences.

4. *Variables that were not denominated in kina and where local prices were required for the calculation of the variable or where adjustments were made in the calculation for differences in local prices.* All calculations related to calories and protein consumed by a household were based on the local prices for food

for each household. Similarly, Food Poverty Lines were constructed on the prices of food in each study area. The calculation of Gini coefficients included adjustments for differences in local prices. Details of these calculations can be found in Appendix II.

Throughout this report values and prices at the time of the study are used. No values have been updated to the present day.

Adjusting for sampling fractions

The study design involving two sample strata, households with wage-earners and households without wage-earners, each with a known relationship to the population of households from which they were drawn, enabled estimates to be made for the group of four low-income census units as a whole.

Across the four low-income census units, there was a sample of 24 out of 304 households with wage-earners and a sample of 24 households out of 111 households without wage-earners. To provide estimates on different parameters for the four low-income census units as a whole, adjustments were made for these different sampling fractions (details in Appendix II). For example, for the four low-income census units as a whole estimates were made of the proportion of households which were not consuming adequate calories and adequate protein.

This method was not used for variables expressed in kina values and subject to price differences between study areas (Type 1 in the previous section on the treatment of price differences between study areas), for example for disposable income per AME. The differences in prices between locations, combined with the different numbers of households in Port Moresby (307) and Madang (108) in the four low-income areas as a whole, meant that any results expressed in kina values for the four low-income areas as a whole would have had little meaning in themselves, and furthermore would not have been comparable with results expressed in kina values for groups of households with wage-earners, without wage-earners and in the lowest quartile. As discussed in the previous section, the reason why kina values for those three groups could be compared with one other was that, within each group, there were equal numbers of households in Port Moresby and Madang, and so the kina values were derived on the same basis.

Chapter 3: The study areas

Introducing the five study census units

Some of the key differences between the study areas are set out in Table 2 as an introduction to the more detailed description of each area which follows in this chapter.

Table 2: Characteristics of the five study areas

Variable	Nine Mile	Gordons Ridge	Biliau	Wagol	Gerehu
Total citizen population					
1980	519	595	299	266	185
1982-83	802	1,056	392	298	171
Number of households					
1980	67	121	55	42	28
1982-83	100	207	65	43	29
Persons per household 1982-83	8.02	5.10	6.03	6.93	5.90
% households without wage-earners					
1980	19	22	31	48	4
1982-83	29	20	46	26	7
Normal residents [a] 1982-83					
% born in town	58	18	54	30	41
% under 15 years	54	35	49	52	50
% 15-44 years	39	60	40	39	49
% over 44 years	7	5	11	9	1
males per 100 females	118	153	123	105	126
Province of birth of largest number of migrants 1982-83	Gulf	Chimbu	East Sepik	East Sepik	Central

Notes. For 1980, from special census tabulations. For 1982-83, from household surveys in this study.

[a] A normal resident was a person who usually lived in a household or had stayed or expected to stay in a household three months or longer.

Nine Mile

In 1982 Nine Mile settlement in Port Moresby was bounded on the east by the stone quarry where many of the original residents worked, on the south by the main road to Sogeri, on the west by a creek across which lived a newly settled group of migrants from the Chimbu Province, and on the north by open grassland. As its name implies the settlement was at some distance from the central business district of Port Moresby. The settlement had two main sections: the old part, formally laid out in rectangular blocks with roads between them, and the new part nearer the Sogeri road where people started building in 1982. The older part had long established palms and fruit trees and older, larger houses mainly of fibro with corrugated iron roofs. The new part was very much under construction with simple shacks and half-built larger houses.

The settlement seemed spacious and the older section shady. Most blocks were bare earth, with a few food gardens along the creek. The main exception to this was the area occupied by people from Goilala in the Central Province where the areas around houses were used for growing food plants. The settlement received a lot of dust because of the adjacent quarry. First, a heavy cloud of dust blew across the settlement when new stone was blasted. Washing was soiled and babies had to be taken indoors. Second, the quarry trucks travelled all day along the dirt road between the old and new part of the settlement, each almost invisible from behind in a cloud of road dust.

Nine Mile settlement was established in 1960 on government land. The founder was from Moveave village in the Malalaua District of the Gulf Province. He was looking for a more secure place to live having worked in Port Moresby for many years. He wanted a place to build his own home and settle permanently and where, he said, he could collect firewood easily. People from the Toaripi-speaking area from which he came were living at the quarry, so he learned of the vacant government land nearby. With government approval he established a community of migrants mainly from his wife's village of Kukipi, also in the Malalaua District. He says that a deliberate effort was made to allow only people from Kukipi and neighbouring villages to join the settlement so that it could be peaceful and orderly.

With the assistance of the Port Moresby Community Development Group, the original section of the settlement was formally upgraded by the Housing Commission in 1973–75 (Norwood, 1984, p. 45). Individual blocks were surveyed

and allocated to named lease-holders, piped water was supplied to an outside tap on every block and streetlights installed on the main streets.

An important event for the settlement occurred in 1982. The company operating the quarry next door decided to pull down their old workers' houses on their leased land and construct better accommodation for their employees. When they did this, they asked all the families on their land who no longer had anyone working at the quarry to leave. They were allowed to take the wood and iron from their old houses with them. As a result, in 1982 many families moved from the quarry to government land and began building in the new area. This accounts for at least some of the rapid growth of the settlement between 1980 and 1983 shown in Table 2.

In the 1970s a small group of migrants from the Goilala District of the Central Province came to live on the edge of the main settlement, with the agreement of the original settler. In 1982 this group accounted for 10 per cent of the settlement population.

Water supplies to taps on individual blocks were limited to the older section. In 1982 there were only a handful of taps at the edge of the new section. Streetlights were limited to the older section. There was a health aid post at the rear of the Catholic community hall, staffed daily by a government aid post orderly. Alternatively, residents could use road transport to travel to the Gordons health clinic or to Port Moresby General Hospital.

Access to primary schooling was poor at Nine Mile. The settlement was within reasonable reach of only one primary school, where there was considerable pressure on places. This school also served the police college, the jail, and other migrant settlements in the area. Many parents complained that they had not been able to find a place for their child in this school. Only 19 per cent of children aged 6–12 years were in school at Nine Mile. This was lower than in the other low-income study areas and well below the national average of 31 per cent (NSO, n.d., Table 10).

The majority of people living in Nine Mile (58 per cent) were not migrants but born in town. In 1982 the oldest of those born in town were already in the 25–34 years age group and had their own children, a second generation of urban born Papua New Guineans. The demographic structure of Nine Mile was rather similar to that of a rural village with a relatively high proportion of women and children and some elderly people.

For many residents Nine Mile was truly their home. They had been born there or intended to die and be buried there. They had borne children there and had seen their adult children set up home nearby. Their nearest and dearest in a social sense were also their neighbours. This explains why many residents did not go home to the village when they were unemployed or retired (Morauta, 1979 and Morauta & Ryan, 1982). Some used the Toaripi word for village, *karikara,* for Nine Mile. One elderly widow living at Nine Mile said "I am afraid to sleep in other parts of the town. I only feel safe if I sleep in my own village".

Nine Mile had a relatively coherent social structure. There was an acknowledged founder and leader of the settlement who was also one of the five appointed village court magistrates. There were peace officers serving the village court and a three-man land committee concerned with the allocation and demarcation of blocks. There were Roman Catholic and United Church leaders and elders. There was both the spirit and the substance of community: orderliness within the boundaries, community activities such as cleaning of the area once a week, courts and church services, dispute settling mechanisms and physical security for those living there. The small Goilala group acknowledged the Toaripi leadership and looked to community leaders for assistance in some matters. During field work, the Goilala group of residents had a fight with some of their relatives living further along the Sogeri road. After that some of the Nine Mile Goilala group spent several nights sleeping with a senior church elder in the Toaripi section of the settlement.

Gordons Ridge

Gordons Ridge was a long hill bounded in 1983 by Hubert Murray Highway on the west, the high covenant suburb of Saraga on the east and north, and an Electricity Commission compound on the south. The settlement was much more centrally located in Port Moresby than Nine Mile, in the old measurements being five miles rather than nine miles from the central business district. The settlement was less than a kilometre as the crow flies from Gordons market and shops. Houses were strung in groups along the top and sides of the ridge and access was almost entirely by steep foot tracks up the sides and along the crest. Houses were smaller than at Nine Mile, often only one room built straight on the ground. In some cases, there were a row of rooms in a long building each housing a separate household. Some of the differences in housing design between Nine Mile and Gordons Ridge may have reflected differences in housing and climate in rural communities of origin. Many houses were built of scrap and second-hand

materials, including uncut sheets of beer cans discarded by the brewery and sign boards.

Houses were arranged in clusters along the ridge rather than in one large group, with some clusters being small and some large. Some clusters were surrounded by fencing and wire with a single cluster entrance for several houses. Sometimes barricades were erected across the foot track along the crest of the ridge to prevent access to one area or another. In general, this central track ran outside rather than through housing clusters. There were shade trees and a few useful plants near many homes. In the wet season peanut and cassava crops were grown on the ridge slopes.

Gordons Ridge was first occupied in 1955 by a Koiari (Central Province) settler who was working for a company that took fill for construction projects from the side of the ridge. He was looking for somewhere to build a family home and established that the land belonged to the government. In 1983 he and Koiari from three different rural villages occupied two housing clusters in the centre and south of the ridge.

But the population had grown much beyond this original group by 1983. By then there were a number of other separate groups on the ridge and normal residents born in the Central Province (and these included a group from the Goilala District near the taxi compound) were only 15 per cent of the population of Gordons Ridge. The largest group by province of origin were migrants from the Chimbu Province (43 per cent of the population). There were migrants from every district in that province but Kundiawa, Gumine and Chuave predominated. There was also a group of migrants from Lufa in the Eastern Highlands and small groups from the Northern and Madang provinces.

Although there had been attempts to move settlers off Gordons Ridge in the past (Norwood, 1984, p. 33), the population of the census unit was growing rapidly in the early 1980s. In the 1980 census the population was 595. In March 1982, the Department of Urban Development conducted its own census as a basis for a proposed upgrading and found 960 people there (Department of Urban Development, 1982). In February 1983, this study recorded 1,052 persons as normally resident. A large number of residents of Gordons Ridge (41 per cent) arrived in Port Moresby within the last five years. Only 18 per cent were born in town.

This pattern of recent migration explains the demographic structure of Gordons Ridge, with 153 males to 100 females and 60 per cent of residents in the 15–44 age

group (Table 2). Commonly when migrants first came to Port Moresby from the Chimbu and Eastern Highlands provinces, men came on their own. It was only later when they had work or housing or decided to stay longer in Port Moresby that they brought wives and families to join them. The higher cost of transport to the home area (air transport was required) also impacted on the capacity of migrants to bring families to Port Moresby.

There were few services for residents of Gordons Ridge at the time of the study. There were no surveyed blocks, no documented tenure, no garbage disposal, no electricity or public lighting and no telephones. There was only one road for vehicle access to a single point on the ridge built in 1981. There were 31 taps for 207 households, and these were unevenly distributed. The Chimbu and Koiari housing clusters at the south end had two taps for 36 households. There was always a line of buckets and cans waiting to be filled at these taps. Residents on the west slopes and along Hubert Murray Highway had no taps since existing pipelines all run from the main in Kanage Street on the eastern side of the ridge. At the time of this study the Department of Urban Development had drawn up plans for 149 site and service lots for Gordons Ridge.

In 1983 Gordons Ridge was within easy reach of a number of primary schools in neighbouring suburbs and school enrolments were higher than at Nine Mile. An overall 36 per cent of children aged 6 to 12 years were in school, with a higher proportion of boys than girls in school. Parents described how on the day of first grade enrolments they had rushed from one school to another, only to find all places were taken. Once again there were many complaints about being unable to find school places for children. Although there was no aid post on Gordons Ridge, residents were within easy walking distance of the Gordons health clinic, and some also walked to Port Moresby General Hospital for medical and dental care.

At the time of the study there was not much sign that people living on Gordons Ridge saw themselves as permanent urban residents. Koiari residents had close contact with their home villages and frequently travelled home to make gardens or collect materials for their basketware industry. The Chimbu and other highlands groups had a high proportion of young and single male adults and comparatively few women and children. Some of the men had wives or children at home in the rural area. The bodies of those who died in Port Moresby were sent home and there was little cash investment in housing. Even the nails used in building were often straightened second-hand nails. Some residents from the highlands told us they would like to return home but did not have the airfare.

There was no sense in which Gordons Ridge comprised a single community. It was not one settlement but several occupying a single census unit. Each group had its own senior men or leaders, but there was no one leader for all the groups. Two leaders, one Gumine and one Koiari, were known to many residents but they had no role in relation to those not in their own group. Most residents knew by name only people in their own language group and interacted only with them. There were no councillors, village court magistrates or land committee officials. Roman Catholic and Seventh Day Adventist services were held within small groups on the ridge. However, most residents attended church services in the neighbouring suburbs. Residents of Gordons Ridge had considerable social contact with family and people from their own rural area outside the Ridge. They could do this because they were within easy walking distance of the Chimbu settlements at Ragamuga and Saraga, the low covenant housing areas of Gordons and the high covenant areas of Boroko and Korobosea, where friends and relatives might be living in quarters for domestic servants.

Relations between groups on Gordons Ridge were not always harmonious. Longer established groups resented newcomers, and people from different cultural backgrounds found one another's ways strange and sometimes unsavoury. Weekend drinking parties sometimes led to confrontations between groups, one such delaying the start of the study for two weeks. Resolving such disputes was difficult because there were no obvious structures for resolution between groups.

During weekdays Gordons Ridge was quiet and almost deserted. Although not everyone had a job, most men went out in the daytime. Women and small children remained at home. The emptiness in part reflects the central location. Places of employment or potential employment, places to sell products, markets and shops and places to meet people were all close by.

Biliau

The Biliau census unit was situated on the north shore of an inlet of Madang Harbour. Houses stood among tall coconut palms and fruit trees and there were areas of trimmed grass. To the north the census unit was dominated by the large twin chimney stacks of the Jant woodchip mill, and the huge pile of chips waiting for shipment. These chimneys sent clouds of smoke over the residential area when the wind was from the north-east. A busy all-weather road ran past the western end of the census unit on its way to the airport and a single-track branch road ran between the houses of the unit parallel to the shoreline.

The heart of the census unit was one of the two main clusters of population of the traditional Madang village of Bilia (spelt Biliau in the census and therefore in this study). The other main cluster of population of the traditional village of Biliau was on a small offshore island, which was not part of the census unit. The Biliau people are speakers of the Austronesian Bel language they share with other coastal villages in and near the Madang urban area. Historically the Austronesian speakers were relatively recent arrivals in the Madang area, compared to their inland neighbours who spoke non-Austronesian languages.

Their traditional economy was focussed as much on fishing and trading as on growing taro and yam. Their land holdings were never as extensive as those of their inland neighbours, but these land holdings have been much reduced by acquisition first for plantations and second for the township and airport of Madang. At the time of the study there was little land left to them under customary tenure and they gardened mainly on land owned by the government for the planned reorientation of the Madang airport. As one Biliau villager described it: "The town has grown around us, and we are in bad way". Some of the land they used at the time of the study was less fertile than before because of shortened fallows. It was no longer suitable for yam and taro but only for cassava and sweet potato. Biliau villagers had insufficient coconuts to make copra and no sago. They said that there were fewer fish in their lagoons and fishing grounds than in the past because of fishing by townspeople. Some Biliau villagers had gardens on the land of their in-laws and relatives in other Madang villages, either coastal (such as Siar) or inland (like Hilu). By various means many Biliau villagers maintained some form of a subsistence base, a base not available to anywhere near the same extent to migrants in the census unit.

Biliau villagers were only about half the residents of the Biliau census unit. The exact proportion is not clear from the household survey which recorded 'persons born in town' as 54 per cent of normal residents. The number of these born to residents who were not Biliau villagers is not known. Migrants made up the remainder of the census unit's population, with 24 per cent of all residents being born in the East Sepik Province and a small number in Morobe and other provinces.

The Biliau villagers have occupied this area since before first contact with Europeans. The first Sepik settler moved on to land in the census unit owned by Biliau villagers with their permission in 1956, and a small group of Sepik people from the Angoram District have set up their homes at the western end of the census unit. The other main community group in the census unit was a large

group of Angoram District people (from different villages from those living on customary land) who lived on government land to the east of the traditional village.

Other households had been allowed to settle on traditional land and live among Biliau villagers: four from Sio in the Morobe Province, two from the Bagesin area of the Madang Province, two from Irian Jaya, one from another local Austronesian village, and one from Enga Province.

At the time of the study East Sepik residents of the census unit had been in Madang for some time. Of those born in the East Sepik 39 per cent had lived in Madang for 10 or more years. There were 12 East Sepik residents in the census unit aged 50 years or more. There were young adults who were Sepik by descent but born in town. They were in a similar position to the Gulf people living in Nine Mile, the East Sepik Province people being to Madang what the Gulf Province people were to Port Moresby. When children and young people were raised in Madang, their parents were unlikely to go home to the village. As one older man told us: "I do not know my village. My children were all born here. So, I will die in town. My children have never been to my village. They would be afraid of the village".

There was something of a distinction in the East Sepik community between the longer-established migrant families and the recently arrived. Community elders were often critical of newcomers, especially teenage boys who they said were difficult to control. However, teenagers newly arrived from the East Sepik (resident over 6 months and under five years) were few in number: only nine males aged 10–19 years out of a total of 89 East Sepik migrants.

Services in the census unit varied by section. All parts had access to a vehicular road, but street lighting was confined to the traditional village sections. There were communal taps throughout, but most houses also had some kind of rainwater collection facility. There were a few freshwater springs and wells in the traditional village section.

Of the four low-income areas studied Biliau had the best access to primary schools with 54 per cent of children aged 6–12 years in school, a figure well above the national average of 31 per cent. For health services residents used Madang General Hospital almost exclusively, many paddling by canoe only a short distance to a landing point convenient to the hospital.

The Biliau village grouping consisted of traditional patrilineal landholding clans, each with different territorial interests and senior male leaders in traditional roles. Lutheran church organisation was strong in the village section. The migrant households living among Biliau villagers were clients of the owners of the traditional land on which they lived. The traditional village of Biliau had strong social ties with other traditional villages in the area, including through intermarriage. The village was represented on the rural Ambenob Local Government Council to which it looked for some services.

The East Sepik community in the census unit looked towards Madang for local government and some services. It was part of Ward 8 of the Madang Town Council and there was an East Sepik councillor who lived close to the Biliau census unit.

There were some tensions between the East Sepik migrants and the Biliau villagers particularly where the East Sepik migrants were living on traditional land. Villagers complained about stealing from their gardens and insulting behaviour. People from the East Sepik pointed out that any troublemakers were a small minority, that they had lived a long time in Madang and had contributed to its growth and prosperity. On a day-to-day basis there appeared to be cordial relations with common use of the road down the middle of the village, and public transport.

Wagol

The Wagol census unit occupied more land than the Biliau census unit. It lay in a flat area between Wagol Creek, the Wagol copra plantation and the junction of Baidar and North Coast roads, and sloping terrain covered with gardens and secondary regrowth rising to the back road that leads to the rubbish dump. It was just over a kilometre from the Biliau census unit.

The population of the census unit was concentrated in two settlements near the road, but there was a small group living further back among the gardens in more open land, and one household was right away from the others on the back hill road. There was a newly established church compound at the junction of the Baidar and North Coast roads.

The largest group of migrants in this settlement was from the Angoram District of the East Sepik Province, 40 per cent of normal residents. Next in size was a group of migrants from the Bogia District of the Madang Province (15 per cent). Groups from the Bagesin and Simbai areas of the Madang Province together comprised

11 per cent. There was one non-citizen household in the newly established church compound. Of all residents, 30 per cent were born in town.

The homes of East Sepik residents were mainly built high off the ground as they were on the riverbanks of their homeland. Since several of these residents were employed by Wewak Timbers, they had bought or otherwise obtained quantities of sawn timber, enabling them to build rather spacious homes. Migrants from the inland of the Madang Province lived on slightly higher ground and had generally built more modest, low-set homes with mainly traditional materials.

The history of the Wagol settlement began shortly after the Second World War when a man from Bagesin in the Ramu District of the Madang Province was working on the Wagol copra plantation immediately to the north of the present settlement. He asked the plantation owner for land on which to build a home and was allowed to settle in the area near the creek. At that time wild rubber grew there and he cut this down to make room for his house. Migrants from Bagesin and then from other areas later settled on nearby land. There were three other main groups: migrants form the East Sepik Province and from Bogia and Simbai in the Madang Province.

The population of the census unit had barely grown since the 1980 census. Indeed, a group of East Sepik families has moved back to their home district since the census, leaving gaps between houses in one area of the settlement.

Services in the Wagol census unit were the poorest of all the low-income study areas. There was no piped water anywhere in the census unit, and households ran out of drinking water in the small water catchment drums when there was a prolonged dry period. The river was used for bathing and well water for cooking but drinking water was a frequent problem. On occasion residents employed by Wewak Timbers hired a company tanker to deliver water to the settlement and fill up household drums.

Sometimes Wagol residents had too much rather than too little water. The main East Sepik residential section was subject to flooding from Wagol Creek. Homes were built on high house posts. Nevertheless in 1978 residents had to be evacuated for one week, housed temporarily in a community hall and provided with government food rations during a flood. On their return they raised their homes on even higher posts above the level of the 1978 flood.

There were no publicly made roads within the census unit. However, Wewak Timbers had dumped truckloads of sawdust to provide a relatively firm track for

vehicles in the main housing area. There was vehicle access to almost all houses in the East Sepik, Bogia and Bagesin areas, but the Simbai settlement amid gardens could only be reached by foot.

No sections in the census unit had electricity or telephone. For health services residents used the Yamba clinic, which was within walking distance, as well as Madang General Hospital which was somewhat further away.

Primary school enrolments were low and quite a lot lower than in Biliau (30 per cent compared to 54 per cent), with some children travelling by bus or on foot to the Sagalau Demonstration School, three kilometres along the North Coast Road. No primary school was particularly convenient for Wagol children, and parents had found it hard to find places in the schools they approached. A shortage of convenient school places was seen as a problem by many parents.

The different groups of migrants in the census unit formed four distinct social groups, Bagesin, East Sepik, Bogia and Simbai. Each had its own sense of community and leaders. Migrants from Bogia and Bagesin lived close together and appeared to know one another well. One Simbai household lived in the Bogia and Bagesin section.

One of the two councillors for Ward 9 of the Madang Town Council lived in the East Sepik section of Wagol and was known in all parts of the census unit. He was a vigorous community leader, holding community discussions and meetings. In the East Sepik section, a drinking and social club known as the Kokomo Club had been established and functioned intermittently. There were no village courts. Many residents were committed to different Christian denominations and there were lay church leaders in each section of the census unit.

Wagol was not primarily a settlement for new migrants to Madang. About one third of normal residents (35 per cent) were migrants who had lived in Madang for five years or more, 21 per cent had lived there for at least 10 years. Another third (31 per cent) were persons under 15 years born in town, the children of these longer-term residents. Only one third of the population had arrived in Madang in the last five years. Newcomers were evenly divided by sex and age group and East Sepik and Madang provinces, except that there was a disproportionately large number of newly arrived girls aged 15–19 years, perhaps joining young men already in Madang or as prospective wives. As in Biliau there was no sign of a flood of teenage boys coming to the urban area.

Gerehu

The suburb of Gerehu on the northern boundary of Port Moresby was a large residential suburb at a considerable distance from the main places of employment and commerce. Construction in Gerehu began in the early 1970s. By the 1980 census the suburb (census division 80) contained a population of 14,761, including 571 non-citizens. The suburb consisted of fully serviced residential blocks and at the time of the 1980 census contained 2000 homes. The majority of these blocks, 80 per cent, were in census units classified as low/mixed covenant, containing low and medium cost permanent houses with a value of between K5,000 and K20,000 in 1984 (Port Moresby Real Estate Pty Ltd houses for sale). Apart from 48 houses institutionally owned, the remainder of the homes in Gerehu were in high covenant census units. In these census units high-cost homes predominated. Typically, these were high-set, three bedroomed homes, with a living area, kitchen, toilet and bathroom in the main house and a laundry either upstairs or underneath the house. Surrounding land on the blocks was often well-tended, being used mainly for ornamental rather than productive purposes. Such houses were on sale in 1984 for between K20,000 and K60,000 (data again from Port Moresby Real Estate Pty Ltd).

The high covenant census unit selected lay between Agolo Drive and Tauriganika Drive in an area of Gerehu relatively close to Waigani Drive. The 26 households covered by the household survey had very mixed backgrounds. Household heads came from 11 of PNG's 20 provinces, with 10 having been born in the Central Province. The only other province from which several household heads came was the Eastern Highlands, the original home of five families.

Most of the households in the census unit were young families. Of the 26 household heads, 23 were under 40 years of age, nine being under 30 years of age. There were almost no residents over 44 years of age. This demographic structure highlights the fact that residents came to live in the high covenant areas of Gerehu because of their individual qualifications, and employment and business circumstances. These were the families of younger men with well-paid jobs, which provided good housing or enabled them to rent or buy good housing. Most of the children in the census unit but only a few of the young adults were born in town. Only 20 per cent of the residents came to Port Moresby in the last five years. Twenty-four per cent had lived in Port Moresby for at least 10 years.

Despite their financial success or perhaps because of it, some residents planned to retire to their rural villages of origin in the longer term, especially those from areas

with road access to Port Moresby. Some had built houses in their home villages for holidays and for their own retirement. It remains to be seen whether at the end of their working lives these men (all relatively young at the time of this study) did in fact leave Port Moresby for their villages, or whether like some of their poorer countrymen living in settlements they preferred to stay nearer their adult children in the urban area.

Services available in the Gerehu census unit were good. All houses had electricity and running water in the house and were on a vehicle road. Streetlights stood at intervals along the roads and private telephone services were available for those who wished to pay for them. All blocks were surveyed, and residents had legal title, leases or rental agreements covering their occupancy.

Residents appeared to use health facilities at some distance form their suburb in the Boroko and Korobosea area. They used both public clinics and private medical services and travelled to these either in their own vehicles or by public transport.

The Gerehu census unit had the highest proportion of children in primary school of all the study areas, 62 per cent of those aged 6 to 12 years. Some children attended a government primary school in Gerehu while others went to more expensive international schools in other suburbs.

Every house in the census unit had been occupied without regard to who was living in the adjacent houses. (The only exception was a small group of houses owned by the National Broadcasting Commission where employees lived next to one another.) As a result, neighbours were strangers when they first came to live next door to one another. Some residents had come to know their neighbours over the time they had lived in Gerehu. But their strongest social ties were not with neighbours but with relatives and friends living elsewhere, particularly elsewhere in Port Moresby and in villages of origin. Ties of neighbourhood did not coincide with ties of kinship, friendship, and patronage as they did in the settlements and the traditional village in the study.

The Gerehu census unit contained much less of a community than the other areas. People in the census unit did not have many interests in common and did not have an informal leader or spokesperson or formal relations with one another. They took part if they wished in elections for the National Parliament and in the affairs of their churches, rural-linked community associations or family groups. But they did not have occasion to act together with their neighbours as a group.

Chapter 4: Earned income

Definition of earned income

At the time of the study, the PNG national accounts distinguished between three components of domestic factor incomes: compensation of employees, operating surplus market component and operating surplus non-market component. In this report, these components are given rather simpler names:

- income from employment;
- income from informal sector; and
- income from subsistence production.

Income from employment came from compensation received for labour services both in cash and in kind. Income from employment included both:

- income from wage employment; and
- income from casual employment.

Income from wage employment was defined as employment in a wage job. If a person was on leave or temporarily absent from a wage job, they were still considered to be in wage employment. Income from casual employment was defined as employment on a one-off basis, for some hours, some days, or some weeks but with no commitment to ongoing employment. Income from casual employment could be earned by members of both households with and households without wage-earners.

Informal sector income was net income in cash and in kind from enterprises owned and operated by the household, with such enterprises operating in the market economy. Subsistence income was derived outside the market economy when a household produced goods and services for home consumption or transfer outside the market. Subsistence income included food and non-food production from gardening, fishing, collecting, and gathering.

The sum of these three components was earned income for a household.

Overview of findings on earned income

The main findings of this chapter are presented in Table 3 and then discussed in the following sections on the sources of earned income and total earned income.

As in several subsequent tables in this report, the results of the consumption surveys are provided in Table 3 for different groups of households, namely:

- households with and without wage-earners from the four low-income areas;
- the lowest quartile of households from the same areas (lowest in terms of net consumption per AME); and
- the sample of households from Gerehu.

Data by household on income and other variables can be found in the household tables.

Table 3: Mean earned income in kina per AME over two weeks by source of income and group of households, with Gini coefficients for population of four low-income areas

Group of households	Employment	Informal sector	Subsistence production	Total earned income
With wage-earners	24.80 [a]	1.47 [b]	2.19 [b]	28.46 [a]
Without wage-earners	0.95 [a]	7.00 [b]	3.93 [b]	11.89 [a]
Lowest quartile	0.03	1.62	3.57	5.22
Gerehu	48.59	14.05	0.87	63.50
Gini coefficients for population of four low-income areas [c]	0.55	0.69	0.60	0.46

Note. Kina values for Gerehu cannot be compared with those for other groups except for employment income, but the composition of total earned income for each group can be compared.

[a] Using the two tailed t-test, the difference between mean income per AME for households with and without wage-earners is significant at the 99 per cent level.

[b] Using the two tailed t-test, the difference between mean income per AME for households with and without wage-earners is significant at the 95 per cent level.

[c] The method used for calculation of the Gini coefficient adjusted for sampling fractions and price differences (purchasing power) between the four low-income study areas (see Appendix II). Row separated because not a kina value.

Income from employment

As would be expected, in Table 3 the difference between income from employment per AME between households with and without wage-earners was large (K24.80 compared to K0.95, with the difference significant at the 99 per cent level). As noted at the beginning of this chapter, employment income in households without

wage-earners was from casual work. The lowest quartile of households had even lower income from employment per AME than households without wage-earners (K0.03).

The minimum urban wage was the same in Port Moresby and Madang at the time of this study. In Table 4 the differences in employment income per AME by location between the four low-income areas were not significant at the 95 per cent level even though in Nine Mile the figure was twice that in Wagol in households with wage-earners. The sample size in each cell in Table 4 was only six, and this will have affected the level of significance.

Table 4: Mean employment income in kina per AME over two weeks by location and wage-earner status of household

Location	Households with wage-earners	Households without wage-earners
Nine Mile [a]	31.11	0.00
Gordons Ridge [a]	27.16	1.52
Biliau [a]	23.25	1.02
Wagol [a]	15.34	1.76
Mean income per AME [b]	24.80	0.95

[a] Using the one-way ANOVA test, the differences between locations for households with and without wage-earners are not significant at the 95 per cent level.

[b] Using the two tailed t-test, the difference between mean income per AME for households with and without wage-earners is significant at the 99 per cent level.

Adjusting for sampling fractions, mean employment income in the four low-income areas as a whole was an estimated K18.42. In Gerehu mean income from employment for all households was more than double that at K48.59. With the minimum wage the same in Port Moresby and Madang, the calculation of a figure for the four low-income areas and the comparison between Gerehu and the low-income areas are reasonable.

The distribution of employment income per AME among households was relatively uneven with a Gini coefficient of 0.55 for the population as a whole in the four low-income areas (see Table 3), with a considerable number of households having no income from employment. Data by household is available in the household tables.

The household surveys covering every person in every household in the four low-income areas and in Gerehu provided more information on the incidence of employment (Table 5). These data describe all households in the study areas and are not subject to sampling error.

The household surveys showed that the proportion of males aged 10 years and over in employment was considerably lower in Nine Mile, Biliau, and Wagol than in the urban sector as a whole. The 1980 census showed that 53 per cent of males in the urban sector were in employment (census basic table Y001 as described in NSO, 1981, p. 9). In Gordons Ridge the male employment rate was higher than in the other three low-income areas and near the urban average. This was related to the demographic structure of Gordons Ridge with the population concentrated in the age group 15–44, with fewer young people 10–14 and persons over 44 than in other areas. The location of the settlement close to employment opportunities may also have been a factor in the male employment rate. Women were less likely to be employed than men across all study areas. In the 1980 census the national urban average for women was 13 per cent (census basic table Y001).

For males there was a major improvement in employment rates between the 15–19 and 20–24 age groups, and in Nine Mile, Biliau and Wagol, there was another improvement between ages 20–24 years and 25–29 years. Employment rates then tended to stay fairly steady until 45 years when a decline began to occur. For women, a pattern by age was less clear. Teenage girls were quite frequently employed as babysitters and domestic servants, while other women were generally less likely to be employed.

The occupational profile in the four low-income areas was fairly similar with over half of workers employed in production and transport or as labourers. In Biliau and Wagol 18 per cent and 29 per cent of employed persons worked for a single employer, Wewak Timbers. Many residents worked in unskilled or semi-skilled jobs where employment was not always secure. The rates of employment and the occupational profile of Gerehu residents largely explained the differences in employment income between Gerehu and the low-income areas.

In the household surveys, following the 1980 census (NSO, 1982, p. 25), there were two economic activity codes that together were taken as constituting unemployment. The two codes were: 09, other activities and looking for work, and 10, other activities and not looking for work (see Appendix III for the household survey form, which contains the full set of economic activity codes).

Table 5: Employment characteristics of study areas

Employment variable	Nine Mile	Gordons Ridge	Biliau	Wagol	Gerehu
% 10 years and over in employment [a]					
% males	35	56	32	45	66
% females	6	6	6	15	32
% males employed by age group					
10-14	0	4	0	0	0
15-19	5	27	21	27	33
20-24	56	71	35	50	83
25-29	75	70	56	75	92
30-34	70	66	100	100	80
35-39	73	70	57	57	67
40-44	64	70	71	50	100
45 or more	36	48	44	53	100
% females employed by age group					
10-14	0	4	0	10	0
15-19	10	4	11	13	0
20-24	5	7	22	40	43
25-29	13	6	0	0	33
30-34	6	7	0	0	50
35-39	7	7	0	18	0
40-44	0	0	0	0	100
45 or more	6	0	7	0	n/a
% employed persons in main occupational categories [b]					
Clerical and related workers	13	8	2	0	24 [c]
Sales workers	3	13	12	6	0
Service workers	17	23	12	33	9
Production and transport workers	60	35	45	42	31
Labourers	0	20	24	10	0

Notes. From household surveys of all households in study areas. 1980 census definitions used throughout.

[a] Employment defined as wage employment where the person employed was coded as engaged in either economic activity 01 (worked at a wage job) or economic activity 02 (on leave or temporarily absent from a wage job) as in the 1980 census (NSO, 1982, p. 25).

[b] Occupational categories as in the 1980 census (NSO, 1982, pp. 27-39).

[c] In addition, in Gerehu 35 per cent of employed residents were either professional, technical, and related workers, or administrators and managers.

The household surveys showed that in the four low-income areas, among males over 10 years, between 28 and 44 per cent were unemployed. The situation for women was less clear because the proportions who were unemployed and either looking for work or not looking for work were much smaller, ranging from 8 to 14 per cent. There was a high number of women coded as 07, working in the house, over 59 per cent in each area. In this group there may also have been some level of unemployment but the extent of this is not clear from the household surveys.

Informal sector income

In the low-income areas, income from the informal sector per AME for households without wage-earners exceeded income from the informal sector earned by households with wage-earners by a factor of five (see Table 3 above). The mean informal sector income per AME for households with wage-earners was K1.47 and for households without wage-earners K7.00. Using the two tailed t-test, the difference between the mean income per AME for households with and without wage-earners was significant at the 95 per cent level.

In terms of value the main sources of informal sector income were (Table 6):

- winnings at cards or gambling (as reported by households surveyed in all areas except Biliau);
- sale of home produce (mainly Nine Mile and Biliau);
- cash taken out of own small business (Biliau only); and
- buying and selling onions and English potatoes (Gordons Ridge only).

Minor sources of cash income were sale of carvings (Biliau), sale of betel nut (Biliau and Wagol), sale of empty bottles (Gordons Ridge) and sale of cooked food (Biliau and Wagol). Some forms of informal sector income were exclusively the preserve of non-wage-earner households: the sale of carvings and buying and selling onions and English potatoes.

The lowest quartile of study households had relatively low informal sector income at K1.62 per AME. The lowest quartile figure was very similar to the figure for households with wage-earners, K1.47, in Table 3. The reasons for this low figure for the lowest quartile is considered in the discussion below.

The Gini coefficient for informal sector income across all low-income households at 0.69 was higher than for employment income at 0.55. Informal sector income was the most unequally distributed between households of the three sources of earned income. This arose partly because of the relatively high proportion of

households that had no income from the informal sector (23 per cent across the four low-income areas as a whole, calculated from data in the household tables), and partly because of the uneven distribution of income among those households with informal sector income.

Table 6: Types of informal sector income as a per cent of informal sector income over two weeks by wage-earner status of household

Type of informal sector income	Households with wage-earners	Households without wage-earners
	%	%
Gross wins at cards or gambling [a]	47	10
Sale of home produce	19	18
Taken out of other own business	11	22
Buying and selling onions and English potatoes	0	34
Sale or trading in betel nut	9	2
Sale of carvings	0	9
Sale of empty bottles	7	3
Sale of cooked food	4	2
Other	3	0
Total	100	100

[a] Net wins would have been more appropriate, but data not retained. The figures are as reported by households.

For a few households without wage-earners the informal sector provided the equivalent or better of the mean employment income per AME for wage-earners of K24.80 (Table 3), but for most it did not. Two households without wage-earners earned more than K24.80 per AME from the informal sector, earning K38.16 and K27.99 per AME. Two others were around the same level at K24.78 and K23.53 per AME. Most households with informal sector income earned much less (data from the household tables). The mean for households without wage-earners (K7.00 in Table 3) was affected by the four households with high informal sector earnings. Without these four households the mean for the remaining 20 households without wage-earners was K3.24.

The question arises as to why households with wage-earners earned so much less on average than households without wage-earners from the informal sector.

Earning informal sector income often had low returns to labour. Any activity involving selling produce involved a long day at a market or looking after a local selling point in the census unit. When compared to wage employment, the returns could be poor. If a household had a wage-earner, the household may not have been as desperate for cash income as a household without a wage-earner and had less incentive to engage in these low return activities. Another factor, depending on the composition of the household, may have been the availability of labour for informal sector activities in households with wage-earners. For example, in a household with only two adults and several young children, and with one of those adults in wage employment, there may have been little spare time for informal sector activities.

This consideration of wage-earners and the informal sector, only partly helps to explain low informal sector income in the lowest quartile households. The incentive to earn cash was certainly there for lowest quartile households, given they had the lowest net consumption per AME of all households. There may have been some labour constraints, perhaps related to household size or illness rather than employment. In terms of the age of the household head, there was a higher proportion of households in the lowest quartile (42 per cent) with heads aged 50 and over than among households with wage-earners (21 per cent) or without wage-earners (29 per cent) (data from the household tables). This may have been part of any labour constraint in lowest quartile households. However, as will be seen below lowest quartile households were active in subsistence production.

In Gerehu the two households without wage-earners made substantial incomes from informal sector activity (K87 and K25 per AME) over the period. The value of Gerehu informal sector incomes was affected by the fact that they were earned entirely in the Port Moresby market. Details by household are available in the household tables.

Walsh has discussed the reasons for the low level of activity in the informal sector (Walsh, 1983, p. 416). He considered the most likely causes were lack of knowledge and skills for the urban economy and the domination of the urban economy by large formal sector suppliers of most goods and services required. To this might be added geographical location of the study areas, safety concerns particularly for women, and a lack of starting capital. Nine Mile was far enough away from built up areas to mean that small scale trading activities were limited almost entirely to sales within the settlement. In contrast Gordons Ridge was close to Gordons market and residents were able to trade in the market without incurring transport costs.

It is likely that street selling and marketing within the neighbourhood have increased since the time of this study. In 2011 the census found that 28 per cent of urban citizen households were engaged in selling food crops and cooked food and 32 per cent were engaged in selling betel nut up from 23 and 25 per cent in 2000 (NSO, 2015, p. 75). Later case studies also indicate how widespread these activities have become in some settlements. In Rooney's 2013 sample of 33 households in a Port Moresby settlement, 17 were engaged in local retail activities, including households with wage-earners. Women were the main people engaged in these activities (Rooney, 2017, pp. 247–8). Barber reported for 24 households in Eight Mile settlement in Port Moresby in 2000 that the main source of cash income for households without wage-earners was informal street selling (Barber, 2003, p. 292).

Subsistence income

Subsistence income was rather more evenly distributed between households with and without wage-earners than was informal sector income (Table 3). However, subsistence income per AME was still significantly higher (at the 95 per cent level) for households without wage-earners, K3.93 compared to K2.19 for households with wage-earners. It appears that subsistence returns were not as attractive to wage-earner households, and they did not pursue these opportunities as vigorously as households without wage-earners.

The lowest quartile of study households had moderate subsistence incomes at K3.57 per AME. Lowest quartile households were earning subsistence income at much the same rate as households without wage-earners. Mean income per AME from subsistence for the lowest quartile was double that from the informal sector income, K3.57 compared to K1.62 (Table 3).

More households took part in subsistence activities than in informal sector activities, but there was large variation in incomes earned. Across the four low-income areas as a whole, only an estimated 13 per cent of households had no subsistence income, compared to 23 per cent with no income from the informal sector.

In Gerehu only four of the 11 households had any subsistence income. The value of Gerehu subsistence incomes was affected by the fact that they were earned entirely in the Port Moresby market. Details by household are available in the household tables.

The Gini coefficient for subsistence income across all households in the four low-income areas (0.60, Table 3) was somewhat higher than for employment income but lower than for informal sector income.

One of the main sources of difference in subsistence income between households was the opportunity to earn such income based on location of residence. In Nine Mile there was access to rivers and swamps for eel and fish, particularly *tilapia* (a freshwater genus of fish known by its Latin name by study participants), and woodland for firewood. Nine Mile households also took road transport to better freshwater fishing areas. Eel and *tilapia* were also commonly sold in Port Moresby markets (Varpiam et al., 1984, p. 59), although not by Nine Mile households who lived too far away. In Biliau there was access to land for gardening, particularly for yams at the time of the study. Coconuts were also important subsistence products in Biliau. There was subsistence gardening in Wagol (coconuts and yams) and in Gordons Ridge there were a few peanut and sweet potato gardens on the sides of the ridge. No residents of the study areas had access to sago palms, and yams were only grown in Madang.

Further information on subsistence activities was available from the household surveys where there was a question about whether the household had undertaken any subsistence activities during the year. The answers to this question gave no idea of volume or value but did indicate engagement with subsistence activities for many households. There were marked differences between the four locations. At Nine Mile, 74 per cent of households said they had been engaged in gardening and 69 per cent in fishing. At Gordons Ridge, the numbers were 50 per cent and 1 per cent with a further 36 per cent engaged in collecting. In Biliau, the numbers were 42 per cent and 30 per cent and in Wagol, 56 per cent and 12 per cent.

In this study, the collection of firewood was included in subsistence production. A study of energy use in 1980 found that 38 households in Nine Mile largely gathered firewood locally and relied heavily on firewood for energy (Gamser, 1980, pp. 8 and 11). The same study found that 23 households in Gordons Ridge largely gathered firewood locally although not from local land or forests but from items discarded by local businesses and stores. This gives something of a new meaning to 'subsistence income'. Some Gordons Ridge households also hired vehicles to gather firewood further afield.

Inequalities in total earned income

Households without wage-earners had average earned incomes less than half of those in households with wage-earners, K11.89 compared to K28.46 (Table 3). Households with wage-earners engaged in the informal sector and subsistence production but at lower levels than households without wage-earners. For households without wage-earners the largest source of earned income was the informal sector but this was unevenly spread across households and more unevenly spread than subsistence income.

In Gerehu, average earned income per AME was K63.50, dominated by employment income. Details by household are available in the household tables.

For the lowest quartile of households, the mean earned income per AME was K5.22. Of this total, 68 per cent came from subsistence production, showing the reliance of the poorest households on this sector for earned income.

Inequality between households in the different components of earned income and earned income was calculated for the four census units as a whole using the Gini coefficient (Table 3 at the beginning of this chapter). For earned income per AME, the Gini coefficient was 0.46 and for each of the components of earned income it was higher:

- for income from employment per AME, it was 0.55;
- for informal sector income per AME, it was 0.69; and
- for subsistence income per AME, it was 0.60.

This indicates that households that had no or low income in one component of earned income made up for it to some extent in others.

Comparable Gini coefficients for earned income alone are not available from other studies. Gini coefficients from other studies on disposable income are included in Chapter 6.

Chapter 5: Interhousehold transfers

Scope and measurement

Transfers recorded for consumption survey households included transfers to and from households not included in the study sample, and to and from households outside the study census units.

The definition of transfers covered:

1. cash transfers in the consumption survey period;
2. transfers in kind (excluding 3 and 4 below);
3. meals given and received;
4. the non-food costs of overnight hospitality (referred to as overnight hospitality);
5. contributions to and receipts from bride price;
6. contributions to and receipts from funeral feasts or other feasts for a dead person;
7. contributions to and receipts from compensation payments, for example related to a court case or a fight; and
8. other transfers worth more than K20 in the previous two months.

The data sources on transfers were:

- daily records in the two-week consumption surveys, in which values were placed on transfers in kind as well as in cash (items 1 and 2 above);
- daily records of meals given and received between members of different households and overnight hospitality given and received with the value of these computed at the analysis stage, based on the age and sex of the visitor and the cost of consumption in the survey household (items 3 and 4). This method provided a relatively accurate estimate for outwards transfers of meals and overnight hospitality based on the donor household's consumption pattern. However, for inwards transfers the method assumed the meals and overnight hospitality received had the same value as if they were outwards transfers made by the study household. This is an assumption of necessity since measuring consumption in non-study households would have been a major task. It also had some merit in that it valued meals and overnight hospitality received at what were essentially the savings to the study household. Further details are available in Appendix II;

- recall questions covering the previous 12 months, covering relatively rare events such as bride price, feasts, and compensation (items 5, 6 and 7); and
- recall questions covering the previous two months, covering transfers worth K20 or more not included in items 5, 6 and 7 (item 8).

Details of the questions asked can be found in the survey forms in Appendix III.

The answers to recall questions over two and 12 months were reduced to two-week equivalents to be added to the data from the consumption surveys. At the time of writing this report the recall data were not available by household and therefore by groups of households. As a result, most of the analysis in this chapter is in terms of transfers within the consumption survey period. Where recall data is included, this is made clear in the table.

In this study, following the HES approach, a normal resident was defined as a person who usually lived in a household or had stayed or expected to stay in a household three months or longer. A visitor was defined as a person who either ate a meal or stayed overnight in a household where they were not a normal resident. A visitor included a person who had been staying in a household other than their own for less than three months.

In other studies, the presence of visitors in a household and the absence of a household member visiting another household are both treated through an adjustment to the AME for the household. If a normal member of the household is away, the AME for the household are reduced and for visitors to the household the AME are increased (World Bank, 2000, p. 70; Gibson, 2012, p. 2). This method avoids inflating or deflating consumption per AME in the household. However, it does not provide a way of seeing meals and overnight hospitality as part of the ebb and flow of resources between households, as part of the transfers system. Yet these are transfers of value between households with effects on the consumption levels of both donor and recipient households.

In this study a different approach was used. A value was given to meals and overnight hospitality received and given. The value of meals and overnight hospitality received was added to the value of consumption in the study household. The value of meals and overnight hospitality given was deducted from the value of consumption in the study household. The AME for the study household were calculated as normal residents plus normal residents temporarily absent (who consumed the inwards meals and overnight hospitality included in household consumption). No figures were added to the AME for the study household for visitors to the household since the consumption associated with

these visitors was not included in the household's consumption. The data used for the analysis described above and in Appendix II is of the type normally collected in household income and expenditure surveys (for example, the presence of overnight visitors and visitors at meals, absences by normal residents plus net consumption in a study household). This means that the approach could be replicated in other studies.

The value and composition of transfers

Transfers were a major part of the lives of study households. All 48 low-income households were engaged in inwards and outwards transfers of one kind or another (data from the household tables). To give an initial idea of the scale of transfers activity, inwards transfers were equivalent to 25 per cent of the value of earned income for households with wage-earners and 65 per cent for households without wage-earners, when recall data on transfers were excluded (calculated from data in the household tables). Another indicator of the scale of transfer activity was that for the 48 low-income sample households the study team recorded 1,065 individual transfers in kind over the two-week period, an average of 22 transfers per household (see Table 12 below).

As with cash income, there was a likelihood that some cash transfers were not reported or underreported by study participants. Cash transfers did not need to be as public as transfers in kind or meals and overnight hospitality. Notes could be folded and slipped to someone without others seeing. The value of a cash transfer could also be underreported. With the sensitivities around who had what available and who gave what to whom, cash could remain in some ways a more private transfer.

Among inwards transfers, transfers in kind were the largest single category at 37 per cent of all transfers by value (Table 7). Among outwards transfers, meals given at 25 per cent were slightly ahead of cash transfers at 23 per cent. The value given to overnight hospitality was not significant but was useful as an indicator of overnight guests, where meals were associated with the visit. Contributions to bride price, funeral feasts and compensation were less important in outwards transfers than other forms of transfer.

Table 7: Value of transfers per AME over two weeks by type of transfer, including recall survey transfers, in 48 study households

Type of transfer	Inwards transfers		Outwards transfers		Total
	kina	%	kina	%	kina
Cash	2.83	33	2.20	23	5.03
Kind	3.13	37	1.86	20	4.99
Meals	1.15	14	2.43	25	3.58
Overnight hospitality	0.08	1	0.23	2	0.31
Bride price [a]	0.12	1	0.42	4	0.54
Funeral feasts [a]	0.05	1	0.57	6	0.62
Compensation [a]	0.01	0	0.31	3	0.32
Other transfers over K20 [a]	1.08	13	1.53	16	2.61
Total including recall data	8.45	100	9.55	100	18.00
Total excluding recall data	7.19		6.72		13.91

Note. Data only available for 48 low-income sample households as a group.

[a] Items from recall survey reduced to value over two weeks.

Participation in transfers

While all households participated in transfers of one kind or another, there was variable participation in different types of transfers (Table 8). The differences in participation between households with and without wage-earners were most marked in relation to outwards transfers, and particularly in relation to outwards cash transfers and meals and overnight hospitality. In the 11 Gerehu households, participation rates in transfers were quite different from those in the low-income areas. There was an imbalance between inwards and outwards transfers in participation in cash transfers and meals and overnight hospitality.

Table 8 shows that nearly all households (whether with or without wage-earners, in the lowest quartile or in Gerehu) received transfers in kind and 90 per cent of all households in low-income areas and 55 per cent of Gerehu households also received transfers in cash. In some ways these are unexpected results, since an initial assumption might have been that households with more resources might receive fewer transfers. This is a conundrum which will be explored further in this chapter.

Table 8: Per cent of households participating in transfers over two weeks by type of transfer and group of households

Type of transfer	With wage-earners	Without wage-earners	Lowest quartile	Pop. of four low-income areas (est)	Gerehu
Inwards transfers					
Cash	88	96	92	90	55
Kind	96	96	100	96	91
Meals	79	100	83	85	27
Overnight hospitality	42	42	50	42	9
Outwards transfers					
Cash	83	46	8	73	73
Kind	88	75	67	85	73
Meals	96	79	75	91	82
Overnight hospitality	50	9	50	39	82

Note. Table excludes recall items.

It is in outwards transfers that participation rates differ more markedly between groups, particularly in relation to cash transfers and overnight hospitality. Within the low-income areas there is a gradient from households with wage-earners at the top, to households without wage-earners to the lowest quartile in participation in outwards transfers, with the gradient being steepest in relation to cash transfers. This is more what might be expected with households with fewer resources participating less in outwards transfers. The participation rate for Gerehu households is lower than for households with wage-earners in the low-income areas, suggesting perhaps that proximity of donors and recipients has some impact on outwards transfers. These issues are further explored in relation to the value of net transfers and the logic of transfers in this chapter.

Three other studies have provided data on participation in transfers in cash and kind (Table 9). These studies show lower levels of participation in transfers than this study. The Hanuabada study in 1996 provided data on cash transfers and transfers in kind in an urban traditional village. This showed lower participation rates than in this study, with a particularly large difference in outwards transfers. The two other studies in Table 9 also showed lower levels of transfers than this study. These two studies covered all types of household in the urban areas

selected, not just those in traditional villages and settlements, and so were not so directly comparable with the four low-income census units in this study.

Table 9: Per cent of households participating in transfers in this study compared to other urban studies

Type of participation	1987-88 Urban PNG [a]	1996 National Capital District [b]	1996 Hanuabada [c]	1982-83 Four census units [d,e]	1982-83 Gerehu [d]
Receiving cash transfers			63	90	55
Receiving transfers in kind		85	84	96	91
Receiving both transfers in cash and in kind	65			85	55
Giving cash transfers			40	73	73
Giving transfers in kind		82	49	85	73
Giving both transfers in cash and in kind	66			68	73

Note. Data from this study are the 1982-83 figures.

[a] From Gibson et al., 2010, p. 25.

[b] From World Bank, 2000, p. 43. Cash transfers excluded because they are defined as K50 or more over 12 months.

[c] From Gibson et al., 1998, p. 45. Transfers in kind cover food items only.

[d] Excludes transfers of meals and overnight hospitality for reasons of comparability.

[e] Adjusted for sampling fractions.

There is a reference in the World Bank poverty study (World Bank, 2000, p. 45) to an analysis of transfers in the 1987–88 urban PNG survey which showed higher levels of transfers in settlements compared to other urban areas. This may account for some of the differences in Table 9 between other studies and this study. It is also possible that the field methods used in this study led to reporting of a higher proportion of transfers in cash and kind than in other studies. A comparison with other studies on the value of transfers compared to income measures is included in Chapter 6 (Table 17).

The value of net transfers

In looking at the relationship between transfers and income and consumption, it is the net effect of transfers which is important. Net transfers are defined as inwards

transfers minus outwards transfers. Many households were giving more than they received and therefore had negative net transfers. There were 30 households in the consumption survey sample that were net recipients of transfers (i.e. they had positive net transfers), and 18 that were net donors (i.e. they had negative net transfers).

Among households with wage-earners, 42 per cent of households were net recipients of transfers, while among households without wage-earners the figure was 83 per cent (data from the household tables). All but one of the lowest quartile households were net recipients. Two of the 11 Gerehu households were net recipients of transfers. Adjusting for sampling fractions to arrive at estimates for the four low-income census units as a whole, the proportion of all households that were net recipients of transfers was estimated at 53 per cent.

From this point in the report, net donor and net recipient households are added to the groups of households for analysis. Kina values for net donor and net recipient households cannot be compared with those of other groups because of the price impacts of the different incidence of Port Moresby and Madang households in the net donor and net recipient groups.

Turning to the value of net transfers (Table 10), net transfers per AME for households with wage-earners were significantly different at −K1.27 from those for households without wage-earners at K2.71. For the lowest quartile households average net transfers per AME were higher than for households without wage-earners at K3.78.

Gerehu households had the highest net transfers value per AME (−K6.89), although the figure is affected by price differences between Gerehu in Port Moresby and the four low-income areas spread across Port Moresby and Madang.

The effects of the inclusion of meals and overnight hospitality costs in this study were considerable. For households with wage-earners, meals and hospitality increased the value of inwards transfers by 13 per cent and outwards transfers by 55 per cent (both on totals excluding recall items). For households without wage-earners, meals and hospitality increased inwards transfers by 30 per cent and outwards transfers by a very large 93 per cent. Working from these percentages the estimated effect for the population of the four study areas as a whole was an increase of 18 per cent in inwards transfers and 65 per cent in outwards transfers as a result of the inclusion of meals and hospitality. The underlying cause for these patterns was that there were many more visitors coming to stay with study

households and eat meals in their homes than there were visits by study households to other households.

Table 10: Mean value of transfers in kina per AME over two weeks by type of transfer and group of households

Type of transfer	With wage-earners	Without wage-earners	Lowest quartile	Net donors	Net recipients	Gerehu
Inwards transfers						
Cash	2.89	2.76	1.76	2.29	3.18	2.25
Kind	3.11	3.17	2.57	3.00	3.22	4.97
Meals	0.70	1.74	1.43	0.73	1.43	0.38
Overnight hospitality	0.09	0.06	0.05	0.09	0.07	0.02
Total inwards	6.78 [a]	7.73 [a]	5.82	6.11	7.91	7.62
Outwards transfers						
Cash	3.30	0.80	0.04	4.59	0.65	7.25
Kind	1.90	1.80	0.85	3.44	0.83	1.42
Meals	2.58	2.24	1.03	3.89	1.48	4.89
Overnight hospitality	0.27	0.18	0.12	0.41	0.12	0.95
Total outwards	8.05 [a]	5.02 [a]	2.04	12.32	3.07	14.51
Net total	–1.27 [b]	2.71 [b]	3.78	–6.22	4.84	–6.89
% households that are net donors	58	17	8	100	0	82

Notes. Table excludes recall items. Kina values for net donors, net recipients and Gerehu cannot be compared with those for other groups, but the composition of total transfers for each group can be compared. Last row separated because refers to per cent of households not kina.

[a] Using the two tailed t-test, the difference between the mean value per AME for households with and without wage-earners is not significant at the 95 per cent level.

[b] Using the two tailed t-test, the difference between the mean value per AME for households with and without wage-earners is significant at the 95 per cent level.

The household surveys added to the picture of overnight visitors. Across the five census units the surveys found at least 10 per cent of persons sleeping in the census units were visitors on the night before the survey. Across the low-income census units, with the exception of Wagol, overnight visitors were more common in households with wage-earners than in households without wage-earners.

The composition of transfers varied between households with and without wage-earners (Table 10). Inwards transfers were similar between the two groups of households by wage-earner status, apart from households without wage-earners receiving more meals. The main difference in outwards transfers was in cash transfers where, not surprisingly, households with wage-earners made transfers valued at four times those made by households without wage-earners.

Of interest is the similarity between households with and without wage-earners with respect to other types of transfers, despite the differences in income. Table 10 demonstrates that even the households which were poorer (households without wage-earners and net recipient households) were engaged in giving as well as receiving transfers. The lowest quartile households were also still making outwards transfers. At the same time households with more resources were receiving transfers even though they were net donors.

There were no significant differences between the mean values of inwards transfers between households with and without wage-earners. This phenomenon is further discussed in the section on the logic of transfers below.

The pattern of transfers for Gerehu households was very similar to that of net donor households in the low-income areas, with outwards transfers per AME almost double the value of inwards transfers.

The pattern of transfers by location

There were also differences between the four low-income areas in the composition of transfers. To avoid the confounding effects of price differences between study areas, the variables considered were the proportion of inwards transfers and the proportion of outwards transfers that were cash, in kind and meals.

The most significant difference between study areas was in transfers in kind as a proportion of both inwards and outwards transfers (both significant at the 99 per cent level) (Table 11). Using the post hoc Tukey HSD (honestly significant difference) test on pairs of locations, for inwards transfers there was a significant difference between Nine Mile and Gordons at the 99 per cent level, and for outwards transfers there was a significant difference at the 99 per cent level between Nine Mile and Wagol and at the 95 per cent level between Nine Mile and Gordons Ridge and between Biliau and Wagol. There were two main factors giving rise to these differences. First, there was the relative importance of subsistence production in Nine Mile and Biliau compared to Gordons Ridge and Wagol, making goods available for transfers in kind outside the market economy.

Second, affecting inwards transfers only, there was the influence of transfers in kind coming into study households from rural villages. These were lowest in Gordons Ridge because of the cost of air transport to homelands and appeared to be particularly high in Nine Mile with a constant flow of visitors from the relatively close eastern Gulf Province.

Table 11: Components of transfers as per cent of inwards and outwards transfers by location

Component of transfers	Nine Mile	Gordons Ridge	Biliau	Wagol
Inwards transfers				
Cash [a]	25	49	22 [b]	52 [b]
In kind [c]	65 [d]	28 [d]	44	40
Meals [a]	9 [e]	22	31 [b,e]	8 [b]
Outwards transfers				
Cash [f]	19	33	29	25
In kind [c]	45 [b,d]	14 [b]	39 [e]	11 [d,e]
Meals [f]	33	49	31	62

Notes. Data are the mean per cent for all 12 households in each location. Recall data are not included.

[a] Using the one-way ANOVA test, the difference between the four locations was significant at the 95 per cent level.

[b] Using the post hoc Tukey HSD test on pairs of locations, the difference between these two locations was significant at the 95 per cent level.

[c] Using the one-way ANOVA test, the difference between the four locations was significant at the 99 per cent level.

[d] Using the post hoc Tukey HSD test on pairs of locations, the difference between these two locations was significant at the 99 per cent level.

[e] Using the post hoc Tukey HSD test on pairs of locations, the difference between a second pair of locations was significant at the 95 per cent level.

[f] Using the one-way ANOVA test, the difference between the four locations was not significant at the 95 per cent level.

There were significant differences between study areas in the role of cash in inwards transfers (at the 95 per cent level), with the difference between Biliau and Wagol being significant at the 95 per cent level (Table 11). It is possible that this difference was related to poorer access to subsistence resources, with cash partly replacing transfers in kind in the transfers system.

There were also differences between study areas significant at the 95 per cent level in the role of meals in inwards transfers (Table 11). These are meals eaten by study households in other households. It might be expected that in Gordons Ridge, with 153 males to 100 females (Table 2), sharing of meals might have been more common. But the most significant difference was between Biliau with a high proportion of meals (31 per cent of inwards transfers) and Nine Mile and Wagol with lower proportions (9 and 8 per cent respectively). The incidence of overnight hospitality received, provides a clue to what was going on (data from the household tables). Among Biliau eight out of 12 households had nights away, with the figure for Gordons Ridge being five out of 12, and for Wagol four, and Nine Mile three. Biliau households in the consumption survey sample were visiting away from home and staying away overnight more than households in other areas during the two-week survey period.

Transfers in kind

As already mentioned, the study recorded very large numbers of transfers in kind in the two-week consumption surveys, a total of 1,065 transfers across the 48 low-income sample households or 22 transfers per household (Table 12).

Table 12: Most frequent items in transfers in kind over two weeks by location

Rank by frequency	Nine Mile	Gordons Ridge	Biliau	Wagol	Gerehu
Most frequent (% transfers in kind)	rice (11)	betel nut (11)	yam (27)	rice (8)	cooking banana (10)
2nd most frequent (% transfers in kind)	*tilapia* (10)	Coke and Pepsi (10)	cooking banana (11)	betel nut (7)	betel nut (10)
3rd most frequent (% transfers in kind)	betel nut (8)	greens (9)	betel nut (10)	dry coconut (7)	dry coconut / free transport (both 9)
Total number of transfers in kind	430	174	264	197	94

Notes. Table includes both inwards and outwards transfers and excludes recall items. Data not retained by household so significance tests not possible. Last row separated because frequency not per cent.

Unfortunately, detailed data on transfers in kind was not retained by household, so no tests of significance can be applied to differences observed. The dominant forms of transfer in kind by frequency in the low-income study households were food items and betel nut. This reflects the importance of these items in low-income household consumption. Betel nut transfers were small and frequent transfers, sometimes of only one betel nut at a time. Betel nut was a common item of transfer when people met casually as well as in their homes.

In Gerehu food and betel nut transfers were also important. An additional frequent transfer in Gerehu were free rides in vehicles owned by study households (Table 12).

The highest value transfers in kind showed a somewhat different pattern (Table 13). While food items remained important in all study areas, beer appeared as the highest value transfer in both Gordons Ridge and Wagol. Subsistence produce was again important in Nine Mile and Biliau with the high market value of eel pushing that product to the top position in Nine Mile. It should be noted that sago transfers in Nine Mile were of purchased sago or the result of transfers from rural households since sago does not grow in the Port Moresby region. The role of beer in festive occasions may be part of the reason for its prominence in Gordons Ridge and Wagol. But there was also a pattern of buying a carton of beer and sharing it around on weekends without the need for a special occasion.

Table 13: Highest value transfers in kind over two weeks by location

Rank by value	Nine Mile	Gordons Ridge	Biliau	Wagol	Gerehu
Highest value (% total value)	eel (12)	beer (34)	yam (43)	beer (18)	betel nut (29)
2nd highest value (% total value)	sago (11)	fresh and frozen meat (8)	cooking banana (9)	chicken (17)	fresh fish (9)
3rd highest value (% total value)	*tilapia* (11)	rice (6)	betel nut (7)	rice (13)	sweet potato (9)
Total value of all transfers in kind (kina)	453.09	193.21	287.52	143.36	328.21

Notes. Table includes both inwards and outwards transfers and excludes recall items. Data not retained by household so significance tests not possible. Last row separated because kina values not per cent.

The overall picture of transfers in kind was that food and betel nut were dominant components and that transfers in kind in low-income households were focused on basic needs. Interestingly in Gerehu, food was also an important form of transfer in kind, although overall in Gerehu, cash and meals transfers were more important by value.

Recipients and donors of transfers

The strongest single pattern observed in the movement of transfers between households were relationships of close family and other ties of kinship (Table 14).

Table 14: Relationship of 48 study households to donors and recipients and value in kina of transfers over two weeks

Relationship to head of study household	Donors in transfers to study households		Recipients in transfers from study households	
	kina	%	kina	%
Father or mother, or father or mother of spouse	122	8	95	7
Child, or spouse of child	119	8	143	10
Brother or wife of brother, or brother or wife of brother of spouse	298	20	270	19
Sister or husband of sister, or sister or husband of sister of spouse	163	11	85	6
Other kin	567	38	731	50
Non-kin	194	13	92	6
Other [a]	22	1	26	2
Not known / not stated	19	1	6	0
Total	1505	100	1449	100

Note. Table excludes recall items and covers low-income areas only. Data only available for the 48 low-income sample households as a group.

[a] Including transfers to and from church officials, an employer, as a result of theft and from a study team member.

In inwards transfers, close family (the first four rows in the table) were the most important donors to study households. In outwards transfers, other kin were more important recipients by value than close family. For transfers recorded in the two-week period and excluding recall transfers 85 per cent of inwards transfers by

value and 96 per cent of outwards transfers were to or from persons described as having some kind of kinship relationship to the study household. Within these figures, the largest group of transfers by value was between the households of siblings.

The second strongest pattern in transfers was by the birthplace of donor and recipient household heads. Of all transfers recorded in the two-week period (and excluding recall items), 67 per cent by value of inwards transfers were from donors born in the same village as the study household head. For outwards transfers, the figure was 60 per cent. Over time this pattern will lessen as more household heads are born in urban areas but at the time of this study there was a strong relationship between people born in the same rural village, whether they were living in an urban area or in the village.

Other patterns in transfers were geographical. The main geographical pattern of transfers inwards and outwards was within the study census unit, averaging 47 per cent of transfers in both cases (Table 15).

Table 15: Location of donors of transfers to and recipients of transfers from 48 study households and value in kina of all transfers over two weeks

Location of donor or recipient	Transfers to study households (x)	Transfers from study households (y)	Net transfers (x – y)
	kina	kina	kina
Same study census unit	812	843	–31
Same town	448	330	119
Other town	65	67	–2
Rural village	294	492	–197
Rural non-village	86	27	60
Not known / not applicable	29	21	8
Total	1736	1779	–43

Notes. Table includes three-month recall data but excludes bride price and other payments not easily attributed to a single donor or recipient. Covers low-income areas only. Data only available for the 48 low-income sample households as a group.

While transfers within the census unit were the dominant geographical pattern, there were two other patterns (Table 15). The first was the importance of inwards transfers from residents of the same town. These accounted for 26 per cent of all

inwards transfers. Linking this to the importance of kinship and village of origin, it is likely that many of the people in the same town who were donors were kin or people born in the same rural village. The second geographical pattern beyond the census unit was the importance of outwards transfers to rural villages.

Overall, the transfers system for the low-income households was largely an intra-urban transfers system. Transfers involving residents of the same urban area (including the same census unit) were two thirds of all transfers, 69 per cent (Table 15). Transfers between sample households and rural villages were one fifth of all transfers (22 per cent).

The logic of transfers

From the patterns of transfers identified in this study, the question arises as to why transfers flowed in the way they did. Why were some households net recipients and some net donors? Why were all households involved to some extent in two-way transfers as well as one-way transfers? Why were close family and kin so important in transfers? Why were transfers concentrated in urban areas? What was the logic behind the patterns observed?

In an earlier study of a rural village with high outmigration I distinguished between different aspects of the motivation for transfers: ceremonial transfers, transfers of reciprocity and transfers of obligation (Morauta, 1984b, Chapter 4). As in the previous study, in this study purely ceremonial transfers played a small part in the overall pattern of transfers in the study households (Table 7 earlier in this chapter). But for the bulk of the transfers recorded, there were transfers which were built to a large extent on reciprocity and other transfers that were built on obligation without an expectation of return, and some that lay on a continuum between these two types.

The most straightforward reciprocal transfers were those where people ran out of a daily consumable such as rice, flour, sugar, or betel nut and asked for help in the expectation that the item would be repaid relatively soon. There were also transfers where people expected some kind of return over the next few weeks but not an immediate return of the same thing. Even further along the line were cases where people helped someone who had an urgent need and expected some kind of longer-term return.

In contrast there were transfers where a sense of obligation to give was a major part of the motivation. In the previous study (Morauta, 1984b), these were often transfers from adults in town to their elderly parents living in the village. There

was a sense in which there was a very long-term reciprocity which made the current transfer a return for the hard work and support parents gave their children when they were young. But a lot of these transfers did not expect equivalence in return in the future. They were based on an ongoing obligation to provide one-way support. The same can be said of transfers between close family members. Many of these were characterised by long-term relationships but there was an element of obligation in the transfer which again may be made without an expectation of return. Gibson et al. (2010) make the same kind of distinction describing the contrast between transfers of altruism and exchange.

To the extent that transfers in the study households tended to flow from richer to poorer households, obligation must have been a part of the motivation for transfers since poorer households were unlikely to be able to make reciprocation of equivalent value. Largely the sense of obligation arose between close relatives (see Table 14). But it also arose when non-kin had long term close associations and then one of them fell on hard times. There were also some transfers which were not set in any long-run relationship but arose from a general sense of obligation to help others who were in great need (for example without food for a day or more). The term 'altruism' might better characterise this subset of transfers. People said in such circumstances they were sorry for or had pity on someone who was going hungry.

The dominance of kinship in the pattern of transfers for study households has already been noted. Some of these transfers were characterised by reciprocity. Others were characterised more by a sense of obligation. When a household fell on hard times and was not in a position to offer reciprocity, they were likely to be relying mainly on people who felt they had an obligation to help them.

A prominent feature of the data from the study is that all households engaged in outwards transfers, however poor they were. In this sense all were engaged in reciprocal transfer relationships. An excess of inwards over outwards transfers rather than the absence of outwards transfers signified a household receiving transfers of obligation as well as of reciprocity.

More recently there have been studies which indicate that the role of kinship in urban transfers may be declining in favour of transfers between those who have ties of neighbourhood, ties with those they work with or for, or ties of more broadly defined relationships. Examples are Hukula (2017), Rooney (2017, p. 343) (both Hukula and Rooney on separate Port Moresby settlements), Goddard

(2005, p. 138) on several Port Moresby settlements, and Iamo (2007, p. 121) on a formal housing development in Port Moresby.

The pattern of transfers observed in this study was the result of a large number of decisions made by individuals (see also Rooney, 2017, p. 341 on the same point). These decisions took many forms:

- immediate decisions:
  - to give something to someone else;
  - to seek something from someone else;
  - to respond to a request for help;
  - to help where a need was obvious, but no request was made; and
- longer term decisions about:
  - where to live;
  - who to live near;
  - how to provide support to elderly parents;
  - how to best protect the welfare of your own children;
  - how to show respect to family and other kinspeople;
  - how to create an environment in which others might help you when you needed it;
  - who needed your help and where you could afford to provide ongoing support;
  - how much you were prepared to reduce consumption in your household to help another;
  - how the transfers you made could support your standing in the community and reflect well on you and your family.

The management of transfers required the constant attention of those involved. None of the households in the low-income areas were wealthy. Yet the 48 low-income sample households were engaged in many hundreds of transactions in the two-week consumption period. There were for example more than 1,000 (1,065) individual transfers in kind or an average of 22 transfers per household, largely of food items, in the two-week period. This does not include cash transfers or meals and overnight hospitality given and received. Managing transfers was a constant juggling act for all households.

Many of the decisions taken were straightforward and followed an established pattern accepted by both donors and recipients. But in other cases, unexpected needs arose, unexpected requests were made, and people moved into and out of the circle of giving and receiving for a household. Some households appeared

more comfortable in managing these decisions on transfers than others. Some net donor households were in a more fraught situation than others, with obligations appearing to outstrip what they had available. Among net recipient households, there were also differences with some being in a strong position to receive assistance, even without asking, while others felt unable to call on sufficient help to meet their needs.

There were times when the demands of relatives were onerous for urban households. The Kukipi households at Nine Mile were sometimes subject to uninvited visitors from the village (within reach by road and canoe of Port Moresby). The visitors might stay for some time and only be willing to return home when their host household had managed to put together an acceptable package of goods for them to take back and to pay their fares home. Meanwhile the host household was providing the visitors with meals and other daily necessities. Many study participants mentioned the burden of visitors staying with them from the village. Participants saw the hospitality they gave as very much part of the burden of the transfers system. Special occasions and feasts, bride price, deaths, compensation payments and the annual requirement to pay for school fees were other sources of pressure on urban households.

Other studies have also emphasised the tensions in the transfers system. Rooney captures this well: "kin and neighbours are important sources of support but, paradoxically, also place severe demands on those who have food, housing and money" (Rooney, 2017, p. xv). Rooney (p. 21) also draws attention to "the paradoxes between actors maximising their individual benefit and as collective beings acting as social actors". Monsell-Davis (1993) describes the ways in which obligations to kin weighed heavily on individuals in Port Moresby and in the case of some young people were so onerous that they acted as a disincentive to take up employment.

Chapter 6: Disposable income

This chapter brings together the data from chapters 4 and 5 to look at the disposable income available to study households. In this study, household disposable income is the sum of income from:

- employment;
- informal sector;
- subsistence sector; and
- net transfers (where the value can be positive or negative). All references in this chapter to transfers are to net transfers.

More simply, disposable income is the sum of earned income and net transfers.

The value and composition of disposable income

Across the four low-income areas, disposable income per AME in households with wage-earners was around double that in households without wage-earners, K27.19 compared to K14.60, with the difference significant at the 95 per cent level (Table 16). Disposable income for the lowest quartile was one third of that in households with wage-earners, K9.00.

Disposable income per AME in Gerehu at K56.61 was much higher than for the low-income area groups. The value of Gerehu disposable incomes was affected by the fact that they were priced entirely in the Port Moresby market.

The composition of disposable income also varied across groups of households (Table 16). In households with wage-earners, disposable income was dominated by income from employment (91 per cent). Income from the informal sector was the largest single component of disposable income in households without wage-earners, 48 per cent of the total. For the lowest quartile households, net transfers were the largest single component of disposable income at 42 per cent, with subsistence production running a close second at 40 per cent. In net donor and net recipient households employment was the largest component of disposable income although at very different levels, 92 per cent and 40 per cent respectively. Unsurprisingly Gerehu disposable income was dominated by employment income at 86 per cent. It is notable that in households with negative net transfers, net transfers made a negative contribution to disposable income thus increasing the percentage contribution of other components to total disposable income.

Table 16: Mean disposable income in kina per AME over two weeks by source of income and group of households, with Gini coefficients for population of four low-income areas

Group of households	Employment	Informal sector	Subsistence production	Net transfers	Total disposable income
With wage-earners	24.80	1.47	2.19	−1.27	27.19 [a]
Without wage-earners	0.95	7.00	3.93	2.71	14.60 [a]
Lowest quartile	0.03	1.62	3.57	3.78	9.00
Net donors	25.15	4.77	3.64	−6.22	27.36
Net recipients	7.24	3.34	2.51	4.84	17.93
Gerehu	48.59	14.05	0.87	−6.89	56.61
Gini coefficients for population of four low-income areas [b]	0.55	0.69	0.60	n/a	0.42

Note. Kina values for net donors, net recipients and Gerehu cannot be compared with those for other groups except on employment income, but the composition of total disposable income for each group can be compared.

[a] Using the two tailed t-test, the difference between the mean income per AME for households with and without wage-earners is significant at the 95 per cent level.

[b] The method for calculation of the Gini coefficient adjusted for sampling fractions and price differences (purchasing power) between the four low-income study areas (see Appendix II). Row separated because not a kina value.

An analysis was undertaken of differences in the composition of disposable income between the four low-income study areas. To avoid the effects of price differences between the areas, the analysis was in terms of the percentage of disposable income from each of the four sources of disposable income shown in Table 16. For example, informal sector income was 21 per cent of disposable income in Nine Mile, 29 per cent in Gordons Ridge, 34 per cent in Biliau and 11 per cent in Wagol. Using the one-way ANOVA test, there were no significant differences at the 95 per cent level between the four study areas for any of the four components of disposable income.

Data on the role of transfers in income (or consumption as a proxy) have been found in four other urban studies (Table 17). All four data sets were from large-scale surveys with the 1975–76 data presented in Table 17 focussed more narrowly on comparable populations to this study and the 1987–88 and 1996 data covering all urban households.

These data suggest transfers played a larger part in income in the four census units of this study than in households in the other studies. This would be expected given the inclusion of the value of meals and overnight hospitality in this study and the field methods used. How far the differences also arose from real differences between the population of traditional villages and settlements on the one hand and the rest of the urban population on the other is not possible to say.

Inequalities in disposable income

The Gini coefficient calculated for the four low-income areas as a whole for disposable income per AME was 0.42 (Table 16). This is a little lower than for earned income at 0.46 (Table 3 in Chapter 4). It is also lower than for any of the components of earned income, employment at 0.55, informal sector income at 0.69 and subsistence production at 0.60 (Table 16).

It was not possible to use the Gini coefficient to measure inequality for income from net transfers because there were both positive and negative income values. However, by comparing the Gini coefficients for earned income and disposable income, the effect of net transfers on inequality can be shown for the four low-income study areas. While the Gini coefficient for earned income was 0.46, for disposable income (earned income plus net transfers) it was 0.42. The effect of net transfers was to reduce by a small amount (0.04) the inequality of income between households.

With all four components of disposable income set alongside one another, it appears that it was the offsetting of inequalities between different types of earned income which made the largest contribution to reducing inequalities in disposable income across the population of the four census units as a whole. It remains to be seen in later chapters what the effects of net transfers were on inequalities of consumption.

Table 17: The role of transfers in income or consumption in this study compared to other urban studies

Measure of role of transfers	1975-76 Traditional and self-help housing [a]	1975-76 Poorest urban tenth [b]	1987-88 Urban PNG [c]	1996 National Capital District [d]	1982-83 Four low-income areas	1982-83 Gerehu
Inwards transfers as % of income including inwards transfers [e]	14	10			32 [f]	13
Net transfers as % of income including net transfers [e]	1	1			2 [f]	–12
Net transfers as % of income including net transfers for net recipient households [g]			9		38	12
Net transfers as % of income including transfers for net donor households [g]			–6		–18	–14
Inwards in kind transfers as % of consumption [e]		5		8	16 [f]	13
Outwards in kind transfers as % of consumption [e]		3		7	10 [f]	4

Note. Data from this study are the 1982-83 figures.

[a] From BOS, 1977, calculated from tables 22(20), 30(28) and 32(30) (table numbers in brackets refer to Bulletin 3, Arawa/Kieta/Panguna).

[b] From BOS, 1979.

[c] From Gibson et al., 2010.

[d] From World Bank, 2000, p. 44.

[e] Calculated from means.

[f] Adjusted for sampling fractions.

[g] Calculated from medians to provide comparability.

Another study used data from the 1975–76 HES to develop a Gini coefficient for household disposable income per AME in the six urban areas, including Port Moresby and Madang, covered by the HES (with disposable income and AME defined in the same way in the HES as in this study). Billington calculated a Gini coefficient of 0.35 for household disposable income per AME across the six urban areas (Billington, 1984, Chapter 6, p. 25). The Billington figure was somewhat lower than the figure for disposable income per AME in this study, which was 0.42.

There are a number of points of difference between the HES and this study which might have impacted on the comparability of these two Gini coefficients. First, the HES figures covered all households in six urban areas not just households in census units classified as traditional villages and settlements. The inclusion of households in other types of census units that were not as poor as the study areas might have been expected to increase rather than decrease the Gini coefficient.

Second, there were likely to have been differences in the quality of income data between the HES and this study. Third, the HES for whatever reason did not capture as many very poor households as expected. The 1980 census found 14 per cent of urban households did not have a wage-earner (see Chapter 2). But an analysis of the poorest tenth of households in the HES (defined as households with the lowest consumption per AME), found only 25 per cent of the 49 households did not have salaries or wages as their main source of cash income (BOS, 1979, p. 4).

The relationship between components of disposable income

Using data from the household tables for the low-income areas, it was possible to look at associations between the components of disposable income. The relationships were measured using the Pearson Product moment correlation coefficient (r). Relationships significant at the 99 per cent level are marked ** and those marked * are significant at the 95 per cent level.

For households with wage-earners, as expected, there was a strong relationship between earned income per AME and disposable income per AME (r = 0.9406**) and between employment income per AME, which was the largest component of earned income, and disposable income per AME (r = 0.9417**). There was no significant relationship in households with wage-earners between earned income per AME and net transfers per AME.

For households without wage-earners, there was a relationship between earned income per AME and disposable income per AME although at a lower level than for households with wage-earners (r = 0.5478*). For households without wage-earners, there was a negative relationship between earned income per AME and net transfers per AME (r = −0.5742*). Among households without wage-earners, as earned incomes fell net transfers increased.

For the lowest quartile of households, the only significant relationship was between disposable income per AME and subsistence income per AME (r = 0.7210*). For the group of 12 households in the lowest quartile, subsistence income was 40 per cent of their disposable income.

Income strategies in low-income households

As in rural areas, earned income in urban areas is partly dependant on the composition of the household in terms of age and gender. Households with heads beyond working age or who are unable to work, or headed by widows, would normally have lower income earning capacity in both the rural and the urban setting. These patterns are only partly apparent in study households.

In the sample of 48 low-income households, there were only two households headed by women, both widows, one in her 40s and one in her 50s. Both had reasonably large households and low disposable income. In both cases more than half disposable income was from net transfers.

Among male household heads, there was no clear pattern by age. There were 11 over 49 years of age (six in their 50s and five over 59 years). Of these, six headed households without wage-earners, four headed households with more than one wage-earner and one a household with one wage-earner. It appears that some households with several adults included an older household head and more than one wage-earner.

The primary strategy for all urban households was to seek employment, including casual work, if they had the capacity. Opportunities in the informal sector were not taken up by all households and were taken up to varying degrees by others. The reasons for this have been discussed in Chapter 4.

Opportunities in the subsistence sector were pursued at least to a limited degree by most households. But opportunities and returns were variable, largely depending on the subsistence opportunities available in each location. Another source of variability was the subsistence skill set of urban residents. The people from the

Gulf province were expert in fishing and gathering produce from rivers and swamps. For many other urban residents, gardening was the main subsistence skill they brought with them when they moved to an urban area.

Strategies relating to transfers were not isolated from the overall management of relationships with family, relatives, and neighbours. The discussion of the pattern of interhousehold transfers showed the importance of kinship, place of birth and neighbourhood in the patterns of transfers between households.

Traditional villages and settlements were urban areas where at the time of the study people had some control over who lived where, and who lived near one another and the ability to extend houses to accommodate additional people. There were good reasons for relatives who wanted to provide mutual support to live near one another. It was much easier to share food and meals (an important component of interhousehold transfers) when living close. There was a clear pattern of single men living alone, eating with other households nearby. In four of the 48 low-income sample households, meals eaten out exceeded the number of meals eaten at home by the household. Three of these four households consisted of one or two adults.

Living in an urban settlement was an economic strategy in itself. Settlements provided low living costs in terms of land and housing, the ability to live near relatives, opportunities for benefiting from the transfers system and in some cases subsistence opportunities not available elsewhere. A later study has shown how urban residents with higher incomes can also find settlements attractive because of low land and housing costs and the prospect of lower living costs in retirement (Rooney, 2017, p. 136).

There was a possibility that management of household size was part of income and consumption strategies:

- There was no evidence from the household surveys in the low-income census units that households without wage-earners had fewer children.
- However, consumption survey households with wage-earners were on the whole 20 per cent larger than households without wage-earners (5.0 compared to 4.0 AME).

There was no significant relationship within the two groups of households by wage-earner status between household size and disposable income per AME or earned income per AME.

Chapter 7: Consumption

Definitions of consumption

In this study gross consumption was the goods and services available to the normal residents of a household for consumption, while net consumption was the goods and services actually consumed by normal residents of the household. The second measure was the one against which living standards and wellbeing of household members were measured and is the consumption measure used mainly in this report.

In this report, where gross consumption is being used it is described as gross consumption. Where net consumption is intended, it is described as consumption for simplicity. The measures of gross and net consumption that are used in this report are described as gross 3 consumption and net 3 consumption in Appendix II, where further details can be found.

Gross consumption, the goods and services available to the normal residents of a household for consumption, was defined as:

> opening stock (food only)
> + income in kind received
> + transfers in kind received (survey period)
> + meals received
> + overnight hospitality received
> + subsistence production
> + cash expenditure (items purchased for cash in the survey period).

Net consumption, the goods and services actually consumed by the normal residents of a household, was defined as:

> Gross consumption
> − transfers in kind given (survey period)
> − meals given
> − overnight hospitality given
> − closing stock (food only).

Net food consumption was the food, including aerated drinks, beer, and alcohol, consumed by the normal residents of a household, and was calculated as for net consumption but for food items only.

There were no cash components of these consumption measures although items purchased for cash were included at the point of acquisition and described as 'cash expenditure'. Cash expenditure on consumer durables from the recall period were not included in the calculation of cash expenditure. Looking at this today, it is not clear why this happened. It appears to be an error. The amount omitted was cash expenditure valued over two weeks at K525 across all 48 low-income sample households. The cash expenditure during the two-week consumption survey period that is captured in the calculations for the 48 households was a total of K3,150 over two weeks, so the amount omitted is of the order of 17 per cent. The omission does not affect any of the calculations relating to food.

The only housing costs included in consumption are those that were actually incurred during the two weeks of the consumption surveys. These included land rent, and maintenance and improvement costs. The imputed cost of a dwelling built by the owner and informal helpers was not included because of the difficulty of establishing a value for such houses. The omission of most housing costs particularly affects the comparison of consumption in Gerehu households with other groups in the study, with the higher value of Gerehu housing consumption not reflected in study figures. The value of any publicly provided services was also excluded from the definition of consumption for all households.

Levels of consumption

Net consumption per AME in households without wage-earners was 66 per cent of that in households with wage-earners, with the difference significant at the 95 per cent level (Table 18). This was not as large a gap as might have been expected from the differences in disposable income per AME between the two groups. Households without wage-earners had 54 per cent of the disposable income per AME of households with wage-earners (Table 16 in Chapter 6).

Of some interest for the themes of this report, is that the story for net food consumption per AME was different to the one for net consumption per AME. While net consumption per AME in households without wage-earners was 66 per cent of consumption in households with wage-earners, net food consumption in households without wage-earners was a higher 82 per cent of that in households with wage-earners. The difference in food consumption per AME between the two groups was not significant at the 95 per cent level, while the difference in net consumption was.

Table 18: Mean consumption per AME over two weeks for consumption measures by group of households, with Gini coefficients for population of four low-income areas

Group of households	Consumption measure				
	Gross (x) kina	Net (y) kina	Net food (z) kina	y/x %	z/y %
With wage-earners	27.59 [a]	21.64 [a]	13.26 [b]	78 [b]	61 [c]
Without wage-earners	19.32 [a]	14.22 [a]	10.86 [b]	74 [b]	76 [c]
Lowest quartile	12.42	9.93	8.38	80	84
Net donors	31.77	22.88	14.19	72 [c]	62 [a]
Net recipients	18.86	15.43	10.91	82 [c]	71 [a]
Gerehu	45.42	38.30	19.24	84	50
Gini coefficients for population of four low-income areas [d]	0.30	0.27	0.22		

Note. Kina values for net donors, net recipients and Gerehu cannot be compared with those for other groups, but the consumption ratios for each group can be compared.

[a] Using the two tailed t-test, the difference between households with and without wage-earners and between net donor and net recipient households is significant at the 95 per cent level.

[b] Using the two tailed t-test, the difference between households with and without wage-earners is not significant at the 95 per cent level.

[c] Using the two tailed t-test, the difference between households with and without wage-earners and net donor and net recipient households is significant at the 99 per cent level.

[d] The method for calculation of the Gini coefficient adjusted for sampling fractions and price differences (purchasing power) between the four low-income study areas (see Appendix II). Row separated because not a kina value.

As expected, the proportion of net consumption devoted to food, the right-hand column in Table 18, increased as household resources decreased. Households without wage-earners devoted 76 per cent of their net consumption to food while the figure for households with wage-earners was 61 per cent. For net donor and net recipient households the figures were 62 per cent and 71 per cent respectively. The difference between households with and without wage earners was significant at the 99 per cent level and for net donor and net recipient households at the 95 per cent level. In line with this trend, the proportion of net consumption devoted to food was 84 per cent in the lowest quartile households and only 50 per cent in Gerehu households.

The proportion of net consumption devoted to food in households without wage-earners was higher than in the poorest urban tenth study by the BOS which found the weighted urban average across all urban areas for this group was 52 per cent (BOS, 1979, p. 9). However, that report comments on the fact that this is a lower proportion than commonly found "in other less developed countries, particularly Asian ones where 65 to 70 per cent is more normal" (BOS, 1979, p. 4). The 65 to 70 per cent range was more consistent with the results of this study than the poorest urban tenth finding.

The differences among groups of households between gross consumption per AME and net consumption per AME were not as large as between net consumption per AME and net food consumption per AME (Table 18). The differences between households with and without wage-earners in terms of net consumption as a proportion of gross consumption were minor and not significant at the 95 per level. The factors contributing to the different relationship between gross and net consumption compared to net and food consumption are considered in the next section which looks first at Gini coefficients.

Inequalities in consumption

The story of the differences between gross consumption per AME, net consumption per AME, and net food consumption per AME continues when Gini coefficients are considered. The Gini coefficients showed a decline in inequality from gross consumption per AME at 0.30 to net consumption per AME at 0.27 to food consumption per AME at 0.22 (Table 18). These are lower values than for the Gini coefficient for disposable income per AME which was 0.42. They are also much lower than the Gini coefficients for earned income per AME at 0.46, and the three components of earned income per AME at 0.55, 0.69 and 0.60 (Table 3).

The main difference between gross and net consumption was that outwards transfers, in the form of transfers in kind, meals and hospitality given, were included in gross consumption, and not included in net consumption. With the Gini coefficient for net consumption per AME lower than for gross consumption per AME, it follows that the effect of these outwards transfers was a small reduction in inequality.

The difference between net consumption per AME and net food consumption per AME was the amount of consumption devoted to non-food items. As already observed, as the resources available to a household declined, the proportion of their consumption that was devoted to food increased. Households focussed increasingly on basic necessities as their resources declined. As a result, inequalities in net consumption per AME were larger than inequalities in net food consumption per AME.

Gibson has calculated the Gini coefficient for Port Moresby urban household net expenditure/consumption (excluding durables) per AE (rather than AME) for 1987–88 (0.38) and 1996 (0.40) (Gibson, 2000, p. 543). To the extent that the Gibson figures are comparable with the figure of 0.27 in this study, the Gibson figures suggest that there could have been more equality of consumption within traditional villages and settlements than in urban areas as a whole. This would make sense since urban areas have a greater range of incomes than the four low-income areas in this study. However, the comparison is difficult to judge, partly because of the different focus on collecting data on transfers and the inclusion of meals and overnight hospitality in the definition of transfers in this study.

The construction of gross consumption

This analysis of the construction of consumption is in terms of gross consumption, which is consumption before outwards transfers in kind, meals given, hospitality given and closing stock are deducted, so that the origins of resources available for consumption are described. If net consumption were analysed there would be negative values for outwards transfers and closing stock within the total.

Gross consumption per AME was constructed differently in households with and without wage-earners (Table 19). Cash expenditure accounted for 68 per cent of gross consumption per AME in households with wage-earners but only 47 per cent in households without wage-earners. On the other hand, for households without wage-earners, subsistence production accounted for a higher proportion of net consumption per AME than in households with wage earners (20 per cent compared to 8 per cent). Adding all the inwards transfers (transfers in kind, meals, and overnight hospitality received), transfers received were also more important in households without wage earners than in households with wage-earners, 30 per cent compared to 14 per cent.

Table 19: Mean value of components of gross consumption per AME over two weeks by wage-earner status of household

Component of gross consumption per AME	Households with wage-earners		Households without wage-earners	
	kina	%	kina	%
Opening stock	1.30	5	0.90	5
Income in kind	1.32	5	0.37	2
Transfers in kind received in survey period	3.11	12	3.17	16
Meals received	0.70	3	1.74	9
Overnight hospitality received	0.09	0	0.06	0
Subsistence produce	2.19	8	3.93	20
Cash expenditure	18.89	68	9.15	47
Gross consumption per AME [a]	27.59	100	19.32	100

[a] Using the two tailed t-test, the difference between the mean for gross consumption per AME for households with and without wage-earners is significant at the 95 per cent level.

Looking across the different groups of households in this study (Table 20), where household resources were lower, cash expenditure was lower as a proportion of gross consumption. Cash expenditure was significantly more important in the composition of gross consumption for households with wage-earners (68 per cent) and net donor households (71 per cent) than for households without wage-earners (47 per cent) and net recipient households (50 per cent). For the lowest quartile households, cash expenditure was lower than for any other group at 32 per cent of gross consumption. In Gerehu cash expenditure was a higher proportion of gross consumption than in any other group at 81 per cent.

Inwards transfers and subsistence income played a different role from cash expenditure in gross consumption. Inwards transfers and subsistence income were significantly more important for households without wage-earners (26 per cent and 20 per cent) than for households with wage-earners (14 per cent and 8 per cent). Inwards transfers and subsistence production played a larger part in gross consumption for the lowest quartile households than for any other group (33 per cent and 29 per cent). Gerehu was at the other end of the spectrum with 12 per cent of gross consumption coming from inwards transfers and only 2 per cent from subsistence.

Table 20 : Main components of gross consumption per AME over two weeks as per cent of gross consumption per AME by group of households

Group of households	Cash expenditure	Inwards transfers	Subsistence income
With wage-earners	68 [a]	14 [a]	8 [a]
Without wage-earners	47 [a]	26 [a]	20 [a]
Lowest quartile	32	33	29
Net donors	71 [a]	12 [a]	11 [b]
Net recipients	50 [a]	25 [a]	13 [b]
Population of four low-income areas (est)	62	17	11
Gerehu	81	12	2

Note. Inwards transfers exclude cash transfers received for the purposes of consumption analysis.

[a] Using the two tailed t-test, the difference between the mean per cent per AME for households with and without wage-earners and between net donor and net recipient households is significant at the 99 per cent level.

[b] Using the two tailed t-test, the difference between the mean per cent per AME for net donor and net recipient households is not significant at the 95 per cent level.

Analysis of household budgets often assumes that cash is king, and consumers can buy and consume anything they want. However, where a part of consumption depends on transfers, which are the result of choices made by others, and subsistence income, which is constrained to a narrow range of items by the nature of the local urban environment, then the consumer does not have the same opportunities to pick and choose what is consumed. To some extent, it was inwards transfers and subsistence production that drove consumption patterns in study households. This may have resulted in households sometimes consuming high value food items they would not have chosen to buy if they had the cash, for example fresh eel or *tilapia* at Nine Mile. Where this occurred, inwards transfers in kind and subsistence production may have pushed up the value of consumption in study households without there being necessarily a commensurate benefit in living standards or the adequacy of consumption.

The construction of gross consumption was also examined by study area (Table 21). Using the one-way ANOVA test, the differences between study areas were not significant at the 95 level for either cash expenditure or inwards transfers

as a percentage of gross consumption. However, the differences in subsistence income as a per cent of gross consumption were significant between study areas at the 99 per cent level. The largest difference was between Nine Mile and Gordons Ridge, significant at the 99 per cent level with the difference between Nine Mile and Wagol significant at the 95 per cent level. Access to subsistence resources was essentially location based and its role in consumption was significant, particularly in Nine Mile. This finding mirrors the finding on the importance of transfers in kind in Nine Mile and to a lesser extent Biliau in Table 11. Access to subsistence resources in these two areas distinguished them from the other two areas, particularly Gordons Ridge.

Table 21: Components of gross consumption as per cent of gross consumption by location

Component of gross consumption	Nine Mile	Gordons Ridge	Biliau	Wagol
Cash expenditure [a]	47	66	55	55
Inwards transfers [a]	22	24	19	24
Subsistence income [b]	23 [c,d]	3 [c]	15	10 [d]

Notes. Data are mean per cent for all 12 households in each location. Inwards transfers exclude cash transfers received for the purposes of consumption analysis.

[a] Using the one-way ANOVA test, the difference between locations was not significant at the 95 per cent level.

[b] Using the one-way ANOVA test, the difference between locations was significant at the 99 per cent level.

[c] Using the post hoc Tukey HSD test on pairs of locations, the difference between these two locations is significant at the 99 per cent level.

[d] Using the post hoc Tukey HSD test on pairs of locations, the difference between these two locations is significant at the 95 per cent level.

Patterns of cash expenditure also showed the importance of food expenditure in low-income areas (Table 22). For the 48 sample households, 49 per cent of cash expenditure was on food, excluding alcoholic drinks and soft drinks. (Figures for sub-groups have not been retained.) In the HES, expenditure of wage-earner households across six urban areas showed a weighted urban average of a somewhat lower 41 per cent of cash expenditure on food items (BOS, n.d., p. 3) and for the poorest urban tenth, 52 per cent (BOS, 1979, p. 7). Given that 24 of the

48 households in this study did not have wage-earners, the HES result is not necessarily inconsistent with this study.

Table 22: Per cent of cash expenditure by CPI group and subgroup by location for all sample households over two weeks

CPI group and subgroup	Nine Mile	Gordons Ridge	Biliau	Wagol
Food				
Bread, cereals, and other flour products	23	12	20	13
Meat, poultry, and fish	21	17	25	16
Fruit and vegetables	3	5	5	4
Other food	10	9	11	6
Total	57	43	61	38
Drinks, tobacco, and betel nut				
Soft drinks	1	7	1	0
Alcoholic drinks	3	12	2	0
Cigarettes and tobacco	6	8	2	1
Betel nut	5	3	3	4
Total	15	30	9	5
Clothing and footwear	4	5	6	9
Rents, council charges, fuel, and power	1	1	1	1
Household equipment and operation	7	5	13	10
Transport and communications	5	4	4	12
Miscellaneous	11	11	6	23
Total	100	99	100	98

Note. Data on the composition of cash expenditure by household have not been retained so no tests of significance of differences between locations are available.

Income and net consumption and net food consumption

It is useful to explore how far different types of income per AME were related to consumption per AME. This was done for the two groups of households, those with wage-earners and those without wage-earners, using data from the household tables. The Pearson product moment coefficient was used to test the relationship between disposable income, earned income, and income from employment on the

one hand, and net consumption per AME and net food consumption per AME on the other (Table 23).

Table 23: Relationship between income and consumption measures by wage-earner status of household

Income measures per AME	Consumption measures per AME	Households with wage-earners r =	Households without wage-earners r =
Disposable income	Net consumption		0.8753**
	Net food consumption		0.7773**
Earned income	Net consumption	0.6139**	
	Net food consumption	0.5434*	
Income from employment	Net consumption	0.6101**	
	Net food consumption	0.5336*	

Notes. Using the Pearson product moment coefficient, r, relationships significant at the 99 per cent level are marked ** and those significant at the 95 per cent level are marked *. No figure for r indicates the relationships are not significant at the 95 per cent level.

Among households with wage-earners the strongest relationships were between earned income and income from employment (a component of earned income) on the one hand and net consumption. Relationships with food consumption were significant but slightly less strong.

For households without wage-earners the significant relationships were different. With employment largely not relevant to this group, there were no significant relationships between net consumption and earned income or employment income. For households without wage-earners there were very strong relationships between disposable income and the two consumption variables. These were stronger relationships between income and consumption than for earned income and employment for the households with wage-earners.

The difference between the relationships for households with and without wage-earners is partly accounted for by the effect of net transfers. Disposable income is earned income plus net transfers. Net transfers were a positive component of disposable income for households without wage-earners (19 per cent of disposable income), increasing their consumption capacity, and a negative component of

disposable incomes for households with wage-earners (−5 per cent), decreasing their consumption capacity (Table 16). With lower earned incomes and higher net transfers, disposable income was the income factor most closely related to consumption for households without wage-earners.

Other studies have looked at the variables affecting consumption in PNG. These have included the Urban Household Survey of 1987–88 (Gibson, 1998, p. 12), the 1996 household survey (World Bank, 2000, p. 132), and the 2009–10 Household Income and Expenditure Survey (Gibson, 2012, pp. 4–19). The following variables were found to be significantly related to levels of household consumption in these studies: the size of the household, the age of the household head, the years of schooling and literacy of household head, whether the household head was a migrant, and the employment status of the household head.

Using net consumption per AME from the current study, only one of the factors identified in larger samples showed up as significant across the 48 sample households. Using income from employment as a proxy for the employment status of the household head, there was a significant relationship at the 95 per cent level between income from employment and net consumption per AME across the 48 low-income sample households (r = 0.6850), calculated from data in the household tables, as well as the significant relationship at the 99 per cent level (r = 0.6101) already reported between employment income and net consumption per AME in households with wage-earners (Table 23).

Income versus consumption as a measure of living standards

The reliability of income information gathered can be compared with consumption information in this study. At the aggregate level for the 48 low-income sample households, disposable income exceeded net consumption by a plausible margin (K4,670 compared to K3,964, using data from the household tables). But at the level of the individual household, 18 of the 48 households had net consumption that exceeded disposable income, in some cases by a considerable amount. The total value of excess consumption in the 18 households was K516. There is no reason for disposable income acquired in a given period to match consumption in that period. Resources in cash and in kind could be on hand at the beginning of the period and available for consumption during the period and on hand at the end of the period for future consumption.

A detailed examination was made of the 18 households where net consumption exceeded disposable income from data in the household tables. A shortfall in

reporting of cash coming into the household or held by the household at the beginning of the consumption survey period compared to outwards cash movements recorded, explained most of the difference (92 per cent) between disposable income and net consumption. The balance of the difference between disposable income and consumption was explained across the 18 households by running down of food stocks.

Apart from the general difficulties of accurately capturing income which tends to be more intermittent than consumption in a two-week diary method, there are other reasons why income, particularly cash income, may not have been well recorded in this study. Study interviews were not held in private with the main informant in the household. There were often several others present. The presence of others may well have led to under-reporting of cash on hand, other savings, cash gifts received, or cash income received. The person interviewed may have wanted to conceal the cash they had available to guard against requests for cash from other members of the household or even non-household members listening in.

Some wage-earner households took part in a system of informal savings where they contributed funds to a pool and drew it out in turn to provide a larger sum than they might otherwise be able to save for special purposes. None of this was captured in income data. Nor were purchases on credit as opposed to with cash from local stores within the census unit recorded, although these may have been fairly common.

It is necessary to conclude that the study figures on consumption are likely to be a more accurate reflection of living standards in the study households than figures on income.

Chapter 8: The adequacy of consumption

Adequacy of consumption is considered by looking at:

- the calories and grams of protein consumed by study households compared to the minimum requirement for calories and protein for those households. Two different methods are used to define the minimum requirement, the study method and an updated method reflecting later studies of food adequacy in PNG (World Bank, 2000, p. 4); and
- indicative poverty lines, using methods developed subsequent to this study (for example, World Bank, 2000, pp. 97–109).

Background

In 1982 PNG was only at the early stages of defining poverty. The HES not only provided the basis for refreshing the CPI but provided the opportunity for the first attempts to consider the adequacy of urban incomes and the characteristics of the lowest decile of urban households, including in terms of food adequacy.

The two relevant studies from the BOS that drew on the HES were:

- a description of the poorest urban tenth of urban households (BOS, 1979); and
- the development of a tool called the lowest foodcost to define the minimum cost of an adequate diet in different urban areas (BOS, 1980b).

The poorest urban tenth study was an important step in looking at food adequacy and poverty. However, it revealed a lowest decile (as defined by consumption per man unit) which contained a high proportion of households (75 per cent of the 49 households) where more than half of the cash income earned was from salaries or wages (BOS, 1979, p. 4). Given that the census found 14 per cent of urban households did not have a wage-earner, there was a question about whether the poorest urban tenth in the HES really constituted the lowest urban decile.

The lowest foodcost study addressed the question of minimum food costs, an essential element of defining a poverty line. The study based the lowest foodcost budget on the cheapest food sources available, not the foods commonly eaten by poor households. The result was that the budget contained some foods that were never eaten in the households in this study and depressed the value of the budget accordingly. The foods in the lowest foodcost budgets not eaten by study households were, for Port Moresby, brown rice, beef liver, chicken liver and skim

milk powder, and for Madang, brown rice, and beef liver. Nevertheless, the current study built on many of the methods used by the BOS to address the adequacy of food consumption.

Food adequacy measures used

Calorie requirements (study method)

The calorie requirements used in the design of this study are set out in Table 35 in Appendix II. They were based on World Health Organization (WHO) tables (WHO, 1974) and used for the lowest foodcost study (BOS, 1980b, Appendix Table 1). The requirements included 3,000 calories per adult male and 2,200 calories per adult female neither pregnant nor lactating and other figures for different age and sex groups. This was an AME approach.

Calorie requirements (updated method)

The high levels of calorie deficit revealed by using the study method raised questions about how the study defined calorie requirements. As a result, for this report estimates of the adequacy of calorie consumption in study households were also made using what is called here the 'updated method' (drawing on World Bank, 2000, p. 92), to provide consistency with subsequent studies of poverty in PNG. That method used 2,200 calories as the minimum requirement per AE (not distinguishing between male and female adults), where all persons aged over 6 years were counted as adults and those aged 0 to 6 years were counted as 0.5 of an adult.

The formula for calculating the percentage of calories required that was available was calories available / calories required * 100. To use the updated method, adjustments were required to the denominator in the formula:

- An adjustment was required to the calorie requirement for the reference person. The adjustment consisted of decreasing the requirement by a factor of 2200 / 3000.
- There also needed to be an adjustment for the change from AME to AE. Full household composition data had not been retained for all study areas but was available for Nine Mile. The AE for Nine Mile study households were calculated using the World Bank method. The figure for AE was larger by a factor of 1.13 than for study AME for the Nine Mile sample households. The fact

that only the 12 Nine Mile households were used to create the conversion factor for sample households in all study areas is a limitation on the method used.

- The conversion factor for calories required, the denominator in the formula, to move from the study method to the updated method was therefore 0.829 (2200 / 3000 * 1.13).

The effect of this change in the denominator on the figure for the percentage of calories required that was available was to increase all per cent calories that were consumed measurements derived using the study method by 1.206. This did not change the relativities between households or the relationship between calorie consumption and other variables, but it did change the number and proportion of households that had an adequate calorie intake.

Protein requirements (study method)

The study method for measuring adequacy of protein intake was the same as for calories. The protein requirements used in the design of this study are set out as for calories in Table 35 in Appendix II. The requirements included 37 grams of protein per day for a male 20 years and over and 29 grams of protein for a female 20 years and over who was not pregnant or lactating and other figures for different age and sex groups. This was an AME approach.

Protein requirements (updated method)

Alongside the updated method for calorie requirements, an updated method was also developed for protein requirements. In this case the protein requirements used in the World Bank report were higher than in this study, being 45 grams per day per AE (World Bank, 2000, p. 4). Using the same approach as for updated calories, the denominator in the formula for protein requirements was adjusted as follows:

- An adjustment was required to the protein requirement for the reference person. The adjustment consisted of increasing the requirement by a factor of 45 / 37.
- There also needed to be an adjustment for the change in the definition of the reference person from AME to AE. A factor of 1.13, as described for the updated calorie method, was used, again with the same limitation of using only the 12 households in Nine Mile to create the conversion factor.

- The conversion factor for grams of protein required, the denominator in the formula, to move from the study method to the updated method was therefore 1.374 (45 / 37 * 1.13).

The effect of this change in the denominator on the figure for the percentage of grams of protein required that was available was to decrease all per cent protein that was consumed measurements derived using the study method by 0.728. As for the updated method for calories, this did not change the relativities between households but did change the number and proportion of households that had an adequate protein intake.

Following the methodology of the lowest foodcost study (BOS, 1980b), the calorie and protein requirements were compared for each household with the calories and grams consumed by that household during the study period to give a per cent adequacy for each household.

Two adjustments were made to the calorie and protein requirements for normal residents of the households to arrive at the final household requirements. First, the value of normal residents was reduced to take account of meals eaten outside the household by normal residents. Second, the requirements for normal residents were increased to take account of meals eaten in the household by visitors. Details of this method can be found in the section on the nutrition analysis in Appendix II. It is to be noted that this treatment was only used for the calculation of calorie and protein adequacy. In the analysis of consumption in Chapter 7, meals given and meals received were treated as transfers.

The method of defining calories and grams available can be summarised in the following steps:

1. the kina value of each of 41 standard food items in local prices (for example, 1kg rice or a 425g 777 brand tinned mackerel) consumed by each household over the two-week period was established;
2. the yield of each of these 41 food items in terms of calories and grams of protein was established from external reference sources such as WHO tables (WHO, 1969);
3. a calorie and protein yield per kina was established for each of the 41 items from the first two steps; and
4. the calories and grams of protein consumed by the household were then calculated from the kina consumption figures and the yield per kina for each of the 41 items and then summed per household.

Details of this method can be found in the section on nutrition analysis in
Appendix II.

Findings on food adequacy

The findings on calorie and protein adequacy using the study method are
provided alongside the results using the updated method for completeness
(Table 24). The results using the updated method are more comparable with other
recent studies and are used in the remainder of this report unless otherwise
indicated.

**Table 24: Mean per cent of food adequacy and per cent of households below food
adequacy over two weeks by group of households**

Group of households (n)	Mean % of food adequacy				% of households < 100% adequacy	
	Calories (study method)	Calories (updated method)	Protein (study method)	Protein (updated method)	Calories (updated method)	Protein (updated method)
With wage-earners (23)	86 [a]	104 [a]	160 [b]	117 [b]	57	35
Without wage-earners (21)	76 [a]	92 [a]	126 [b]	92 [b]	57	57
Lowest quartile (11)	68	82	106	77	73	73
Net donors (18)	85 [a]	103 [a]	166 [b]	121 [b]	61	39
Net recipients (26)	79 [a]	95 [a]	129 [b]	94 [b]	54	50
Population of four low-income areas (est)	83	101	151	110	57	41
Gerehu (11)	82	99	174	127	55	27

Notes. Only 44 households had data on these variables because four households ate more
meals away from home than at home and the figures were therefore considered unreliable.
The number of households with data in each group is shown in brackets in column 1.

[a] Using the two tailed t-test, the difference between the mean per cent adequacy for
households with and without wage-earners and between the mean per cent adequacy for
net donor and net recipient households is not significant at the 95 per cent level.

[b] Using the two tailed t-test, the difference between the mean per cent adequacy for
households with and without wage-earners and between the mean per cent adequacy for
net donor and net recipient households is significant at the 95 per cent level.

The difference between households with and without wage-earners in mean calorie intakes compared to requirements using the updated method, 104 per cent compared to 92 per cent, was not significant at the 95 per cent level (Table 24). This is consistent with the finding of no significant difference in net food consumption between the two groups. In contrast the differences between the two groups of households on protein adequacy, 117 per cent compared to 92 per cent using the updated method, were significant at the 95 per cent level. This suggests something different was happening with calorie as opposed to protein consumption. This issue is discussed further below.

Looking at other groups of households, a number of features of food adequacy are apparent (Table 24). There is a difference, as above, between the findings on calorie and protein adequacy using the updated method. For the net donor and the net recipient households, the difference in the mean adequacy of protein consumption, 121 per cent compared to 94 per cent, was significant, while the difference in the mean adequacy of calorie consumption, 103 per cent compared to 95 per cent, was not.

Compared to the population of the four low-income areas as a whole, the lowest quartile households fared worse on both calories and protein, but the difference was greater on protein than on calories (Table 24). Gerehu households had almost the same mean per cent adequacy on calories as the low-income areas as a whole (99 per cent compared to 101 per cent). However, on protein they had a higher mean adequacy at 127 per cent than the low-income areas at 110 per cent.

Using the same methods as the study method for calorie and protein consumption compared to requirements, the poorest urban tenth study based on the HES found much lower levels of mean calorie consumption at 46 per cent of requirements and mean protein consumption at 82 per cent of requirements (BOS, 1979, p. 9). The figures for the low-income areas in Table 24 using the study method were 83 per cent and 151 per cent. The poorest urban tenth levels do not seem realistic and can probably be attributed to poorer data, particularly on subsistence income and transfers.

Using the one-way ANOVA test, differences between the 12 households in each of the four low-income study areas in protein and calorie adequacy were not significant at the 95 per cent level. The test was also run for households with wage-earners in each location, and again the differences were not significant at the 95 per cent level. The test could not be run for households without wage-earners,

because the numbers were too low, and some households had no data (see note to Table 24).

Calorie intake was more of a risk than protein intake for households in the four low-income areas. The proportion of households with inadequate intakes was higher in the low-income areas as a whole for calories than protein (Table 24). While it is estimated that 57 per cent of households did not meet their calorie requirements, the figure for households not meeting their protein requirements was 41 per cent. As would be expected the proportion of households in the lowest quartile not receiving adequate calorie and protein intake was higher than for any other group at 73 per cent below adequacy in both cases. For households with more resources, those with wage-earners, net donor households and households in Gerehu, the proportion of households below adequacy was higher for calories than for protein.

The poorest urban tenth study using HES data also showed higher levels of protein than calorie consumption compared to requirements (BOS, 1979, p. 9). In a case study of consumption in eight highlands households living in Port Moresby in 1995, Umezaki and Ohtsuka (2003, p. 17) found that energy levels were slightly below requirements but protein levels much above.

Calorie and protein intake were very closely related in the 44 households for which this variable was available (r = 0.8077, significant at the 99 per cent level, using data from the household tables). Households with lower protein intake were also households with lower calorie intake.

Using data on individual households from the household tables, there were 19 households that consumed less than their requirements in relation to both calories and protein. Nine of these were households with wage-earners and 10 of them were households without wage-earners. Of the 19 households, 12 were under 80 per cent on both calories and protein, another one was under 70 per cent on both measures, and two were under 60 per cent on both measures.

Adjusting for sampling fractions, it is estimated that 41 per cent of households in the four low-income areas received under 100 per cent of both their calorie and their protein requirements. Although this is the same figure as the estimated per cent of households for the four low-income areas which were under 100 per cent of their protein requirements, it is not based on exactly the same set of households. A few households were under 100 per cent on protein and over on calories and a few the other way round.

Calorie and protein intake and income

The relationship with income was stronger for protein consumption than for calorie consumption. For households with wage-earners, the relationship between the adequacy of calorie consumption and disposable income per AME was significant at the 95 per cent level ($r = 0.5746$) and for the adequacy of protein consumption it was stronger and significant at the 95 per cent level ($r = 0.7497$), using data from the household tables. There was no significant relationship between disposable income and protein and calorie consumption for households without wage-earners.

Sources of protein were superior goods, where consumption increased with income more strongly than for calories. This is also supported by the data on the higher income households in Gerehu where average protein consumption was higher than in the low-income areas, but calorie consumption was not (Table 24). In the 1996 PNG household survey data, protein intakes also responded more to increases in income than calorie intakes (World Bank, 2000, p. 411).

The weaker relationship with income for the consumption of calories, and the absence of any significant difference in mean calorie adequacy between households with and without wage-earners, suggests there were constraints on calorie consumption other than simply resources available. Some households felt they were short of food and included a shortage of rice in their complaints. But people also explained that they could not eat any more rice because they did not have other things to eat with it. One man said: "I am sick and tired of rice" and did not eat again until somebody gave him some tinned fish to eat with his rice. It appeared that a lack of variety of calorie sources available, including the absence for some study areas of alternatives to rice such as sago, cooked scones, and flat breads made from flour, and things to eat with rice, may have constrained calorie consumption.

Sources of calories

The most common source of calories across all low-income households was white rice at 32 per cent of calories consumed (Table 25). The other top five sources were, in order: sago (10 per cent), sugar (9 per cent), flour (8 per cent), dry coconuts (also 8 per cent), and yam (5 per cent).

Table 25: Calorie consumption in kilocalories per AME over two weeks by item and location

Item name	Nine Mile	Gordons Ridge	Biliau	Wagol	All four areas	All four areas % total kcal
Rice	12.10	14.64	12.07	9.10	11.88	32
Sago	5.24	0.37	3.02	5.73	3.89	10
Sugar	4.44	4.76	2.26	1.69	3.32	9
Flour	7.26	0	0.75	1.01	2.83	8
Dry coconut	1.21	1.83	4.90	3.71	2.83	8
Yam	0	0	4.90	2.36	1.78	5
Cooking banana	0.81	0.37	1.89	2.36	1.35	4
Tinned fish	0.81	1.46	1.51	1.69	1.31	3
Fresh or frozen meat	0.40	4.39	0.38	0.34	1.13	3
Fresh fruit	2.82	0	0	0	0.94	2
Bread	1.21	1.10	0.38	0.34	0.78	2
Hard biscuits	0.40	1.46	0.75	0	0.60	2
Sweet potato	0	0.37	1.13	1.01	0.59	2
Cassava	0.40	0.37	0.38	1.01	0.53	1
Taro	0	0	1.13	1.01	0.52	1
Tinned meat	0.81	0.37	0.38	0.34	0.51	1
Fats and oils	0.40	0.37	0.75	0.34	0.47	1
Chicken	0.40	0.37	0.38	0.34	0.37	1
Beer	0.40	0.73	0	0.34	0.35	1
Eel	0.81	0	0	0	0.27	1
Sweet biscuits	0.40	0.37	0	0	0.20	1
Butter	0.40	0.37	0	0	0.20	1
Green coconut	0	0	0.38	0.34	0.17	0
Peanuts	0	0	0.38	0.34	0.17	0
Greens	0	0.37	0	0.34	0.15	0
Takeaways	0	0.73	0	0	0.14	0
Fresh fish	0.40	0	0	0	0.13	0
English potato	0	0.37	0	0	0.07	0
Aerated drinks	0	0.37	0	0	0.07	0
Total	41.15	35.51	37.71	33.72	37.52	100

Notes. Figures are based on intakes in all low-income sample households (48 across four locations).

The findings in Table 25 can be compared with Gibson's report on sources of calories for National Capital District (largely Port Moresby) households in the 1996 PNG Household Survey (Gibson, 2012, p. 31). That sample was across all households, not only settlements and traditional villages as in this study. The top five sources of calories in that sample were rice (27 per cent), sugar (11 per cent), fresh or frozen meat (9 per cent), and coconut and tinned fish (both 7 per cent). Sago and flour were more important in the sample in this study than in the 1996 sample, and fresh and frozen meat and tinned fish more important in the 1996 sample than in this study. Given the coverage difference between the two studies, there is considerable congruence.

Differences recorded between the four study areas in the pattern of calorie consumption need to be treated cautiously because, with the original data by household not retained, significance tests of the differences between areas were not possible.

There were differences between the study areas in the main sources of calories other than rice (Table 25). In Nine Mile rice was followed by flour, sago, and sugar in order of importance. In Gordons Ridge after rice, sugar and fresh or frozen meat were the main sources of calories. In Biliau it was dry coconuts, yam, and sago after rice. In Wagol it was sago and dry coconuts after rice. The earlier discussion of the construction of consumption made it clear that these results were driven not only by the purchasing choices of households but by the availability of subsistence production and the nature of transfers in kind.

The main price factor affecting purchases of food was the difference in prices between Port Moresby and Madang for locally produced food. Prices were drawn in this study from CPI pricing surveys for the relevant date, supplemented by study surveys in each location at the time of the consumption survey. In Port Moresby sago cost 58t per kg if purchased but the price was only half that in Madang at 28t. Dry coconuts were 24t per kg in Port Moresby but a fifth of that in Madang at 5t. In contrast store-bought food price prices were similar in Port Moresby and Madang.

As a result, the cheapest sources of calories consumed varied between Port Moresby and Madang. At Nine Mile the cheapest sources per kilocalorie (kcal) were white rice (13t), dry coconuts (15t), sago and flour (both 16t) and in Gordons Ridge they were white rice (12t), dry coconuts (14t), and sugar (17t). In Madang, the cheapest sources of calories per kcal were dry coconut (3t), sago (8t), and white rice (12t).

Subsistence production accounted for the importance of fresh fruit (largely mangoes) in Nine Mile and for dry coconut and yam in Biliau and Wagol. Where subsistence production occurred it also gave rise to transfers of the foods produced between households. In Biliau yams were the most frequent item in food transfers, being 27 per cent of all inwards and outwards transfers (Table 12). Transfers of food from subsistence production outside the study area accounted for most of the sago consumed in Nine Mile and Wagol.

Transfers were also important in the supply of rice to study households. Rice was the most frequent transfer in kind in Nine Mile and Wagol, comprising 11 and 8 per cent of all transfers in kind, respectively (Table 12).

Food preferences and diets in areas of origin were also apparent in the different sources of calories in the four low-income areas. Sago was mainly eaten in Nine Mile and Wagol where people from the Gulf and East Sepik provinces lived. In both those provinces sago was a major staple. The importance of flour in the diet at Nine Mile was due to the cooking techniques used by Gulf people who used flour to make food items similar to those they made with sago as well as non-traditional fried scones.

There was an important difference between Nine Mile and Gordons Ridge in the sources of calories. Households in Gordons Ridge were not eating sago or flour. This meant that they drew a higher proportion of calories from rice (40 per cent) and then relied more heavily on sugar and fresh or frozen meat than other study areas. Of calories in Gordons Ridge 12 per cent came from fresh or frozen meat where the price per kcal was 58 toea compared to 16 toea per kcal for the flour and sago eaten at Nine Mile. This meant the basic diet at Gordons Ridge was more expensive than at Nine Mile.

A distinction can be made between the foods in Table 25 that were purchased in stores and foods that were grown or gathered locally and either produced outside the market sector or purchased at local markets. The latter were mainly fresh fruit and vegetables and fresh fish. Across the 48 low-income sample households, 64 per cent of calories were derived from store-bought foods, with white rice at 32 per cent, sugar at 9 per cent and flour at 9 per cent being the leading items. The 36 per cent of calories derived from locally produced food were mainly from sago (10 per cent), dry coconuts (8 per cent), and yam (5 per cent).

Sources of protein

The main source of protein across all study areas was rice at 27 per cent of total grams consumed (Table 26). In second place, at 18 per cent, was tinned fish. Beyond tinned fish were flour (8 per cent), tinned meat (6 per cent), yam (5 per cent) and fresh or frozen meat (also 5 per cent). Rice, flour, and yam also featured in the top six sources of calories in the four study areas (Table 25), with rice almost as important for protein supply at 27 per cent as it was for calories at 32 per cent.

There were differences between the study areas in the main sources of protein other than rice (Table 26). In Nine Mile rice was followed by flour, tinned fish, and eel in order of importance. In Gordons Ridge after rice, tinned fish, fresh or frozen meat and tea were the main sources of protein. In Biliau it was tinned fish, yam, and dry coconut after rice. In Wagol it was tinned fish, yam, and then dry coconuts and tinned meat (at the same level) after rice. The earlier discussion of the construction of consumption made it clear that these results were driven not only by the purchasing choices of households but by the availability of subsistence production and transfers in kind.

The difference in prices between Port Moresby and Madang for locally produced food also affected the cheapest sources of protein in the study areas. Where food was purchased, the cheapest sources of protein per 100g in Nine Mile were tinned fish (65t), rice (69t) and flour (70t). In Gordons Ridge, they were rice (0.64t), tinned fish (0.64t) and white bread (K1.28). In Madang, the cheapest sources of protein per 100g were dry coconut (26t), tinned fish (62t) and white rice (63t).

Subsistence production accounted for the importance of eel and fresh fish for the supply of protein in Nine Mile and for the contribution of yam and dry coconut to protein consumption in Biliau and Wagol. As with calorie supply, where subsistence production occurred it also gave rise to transfers between households of foods important for protein supply. In Nine Mile *tilapia* caught locally were the second most frequent item in transfers in kind, 10 per cent of all transfers (Table 12 in Chapter 5). In Biliau, as already mentioned, yams were the most frequent item in food transfers, being 27 per cent of all transfers (Table 12). Transfers were also important in the supply of rice, the single largest source of protein.

Differences in dietary preferences between different social groups did not seem so important on the protein side of diets. The main exceptions were the importance of flour at Nine Mile and of fresh or frozen meat at Gordons Ridge as already described.

Table 26: Protein consumption in grams per AME over two weeks by item and location

Item name	Nine Mile	Gordons Ridge	Biliau	Wagol	All four areas	All four areas
						% total grams
Rice	225.2	267.4	228.4	166.2	220.3	27
Tinned fish	103.9	160.4	163.2	187.9	148.7	18
Flour	173.2	0	16.3	21.7	66.6	8
Tinned meat	60.6	26.7	40.8	43.4	45.3	6
Yam	0	0	114.2	57.8	42.0	5
Fresh or frozen meat	17.3	142.6	8.2	14.5	37.7	5
Dry coconut	17.3	26.7	57.1	43.4	35.1	4
Chicken	34.6	35.7	32.6	36.1	34.7	4
Eel	86.6	0	0	0	28.7	3
Fresh fish	60.6	8.9	16.3	7.2	27.5	3
Bread	26.0	35.7	8.2	7.2	19.0	2
Cooking banana	8.7	0	24.5	28.9	15.7	2
Greens	8.7	26.7	16.3	14.5	15.3	2
Tea	8.7	53.5	0	7.2	14.5	2
Hard biscuits	8.7	26.7	16.3	0	12.0	1
Taro	0	0	24.5	21.7	11.1	1
Fresh fruit	26.0	0	0	0	8.6	1
Sweet potato	0	0	8.2	14.5	5.4	1
Peanuts	0	8.9	8.2	7.2	5.4	1
Takeaways	0	26.7	0	0	5.0	1
Sago	8.7	0	0	7.2	4.5	1
Tinned milk	8.7	8.9	0	0	4.5	1
Green coconut	0	0	8.2	7.2	3.7	0
Cassava	0	0	8.2	7.2	3.7	0
Fresh eggs	0	0	0	7.2	1.7	0
Scones	0	8.9	0	0	1.7	0
English potato	0	8.9	0	0	1.7	0
Beer	0	8.9	0	0	1.7	0
Total	883.4	882.3	799.6	708.3	821.8	100

Notes. Figures are based on intakes in all low-income sample households (48 across four locations). Data by household were not retained so significance tests of differences between study areas are not available.

As for calories, the distinction can be made for protein between foods in Table 26 that were purchased in stores and foods that were grown or gathered locally and either produced outside the market sector or purchased at local markets. Study households were more reliant on store-bought foods for protein than for calories. Across the 48 households, 75 per cent of protein consumed was derived from store-bought food, compared with 64 per cent of calories. White rice made up 27 per cent, tinned fish 18 per cent and flour 8 per cent. The 25 per cent of protein derived from locally produced food was from a variety of sources, with yam at 5 per cent, dry coconuts at 4 per cent and fresh fish and eel both at 3 per cent.

Poverty in study households

There were no poverty lines for PNG available in the early 1980s. From data on the 48 low-income sample households, this study developed estimates for three poverty lines for each of the four study areas, a Food Poverty Line (FPL), a Lower Poverty Line (LPL) and an Upper Poverty Line (UPL), using the methodology developed by Gibson and Rozelle and published by the World Bank (World Bank, 2000, pp. 97–109). The main drawback in this exercise was the small number of households (48) in the sample but the exercise has been undertaken to assist in placing this study in the context of other studies.

The World Bank study defines the three poverty lines as follows (World Bank, 2000, p. v):

- The FPL is "based on the cost of a food consumption basket which meets a minimum food-energy requirement of 2,200 calories per adult equivalent per day and reflects the dietary pattern of the lower income groups".
- For the UPL "food expenditures are supplemented by an allowance for non-food expenditures based on the expenditure pattern of those households whose food expenditures just reach the food-poverty line".
- The LPL "is based on the same food expenditures but contains a more restricted allowance for non-food expenditures based on the non-food expenditure share of consumption of those households whose overall expenditures reach the food-poverty line".

The World Bank report notes that because of price variations between areas, separate poverty lines have to be calculated for different areas. The report preferred the use of the UPL rather than the LPL to establish levels of poverty.

The development of poverty lines for the four low-income areas in this study broadly followed this methodology. The details are set out in Appendix II. Key features of the method were:

- The basket of foods used for each study area was based on the calorie consumption patterns of the 12 sample households in each area (see Table 25 in this chapter).
- Prices used for the foods required were also specific to each study area.
- The calorie requirements were those used by the World Bank (2000, pp. 88–92), 2,200 calories per AE, where all persons required 2,200 calories except children 0 to 6 years of age who required 0.5 of that amount.
- The values for net food consumption per AE in the household tables were used for comparison with the FPL and the values of net consumption per AE for comparison with the LPL and the UPL in each study area. The World Bank definition of AE was used in this calculation.

While the calculation of the FPL was consistent with the methods described in the World Bank report, the calculation of the LPL and UPL differed because there were too few households to meet the data requirements. There were no households in the study where food consumption was exactly on the FPL and no households where consumption was exactly on the FPL. Instead, the ratios between the FPL on the one hand and the LPL and the UPL on the other found for the National Capital District and urban areas of the Momase region (Morobe, Madang and the East and West Sepik provinces) in the 1996 study were used for Port Moresby and Madang respectively (Gibson, 2012, pp. 4–6).

For each study household a comparison was made between net food consumption per AE and the FPL, and between net consumption per AE and the LPL and the UPL and then aggregates developed (Table 27). The comparisons of consumption with poverty lines for each study household are set out in the household tables, tables H1 to H6, columns AK to AP.

There were marked differences between Port Moresby and Madang in the value of the FPL, given the difference in prices of the main food items. Perhaps less expected was the difference between Nine Mile and Gordons Ridge, where it was the different food items in calorie consumption in Gordons Ridge households that drove the higher value for the FPL (see Table 25).

On each of the poverty measures, more households were living in poverty in the Madang study areas than in Port Moresby (Table 27). This is consistent with the finding in the poorest urban tenth study using HES data that, across the six urban

areas covered, 33 per cent of lowest decile households were in Madang (BOS, 1979, p. 2).

Table 27: Poverty lines per AE over two weeks by location and number of sample households below the poverty lines

Poverty line variable	Nine Mile	Gordons Ridge	Biliau	Wagol
FPL in kina	7.67	10.97	4.79	4.58
Number of sample households < FPL	0	1	2	2
LPL in kina	10.54	15.07	6.32	6.04
Number of sample households < LPL	0	1	2	3
UPL in kina	12.39	17.72	7.08	6.77
Number of sample households < UPL	1	3	2	4

Notes. The sample size in each study area was 12 households. The number of households below each poverty line is calculated by comparing for each household net food consumption per AE and the FPL, and net consumption per AE and the LPL and the UPL.

The relationship of each household to the poverty lines can be described in terms of different groups of households (Table 28). For most groups of households there was a lower incidence of poverty at the FPL than at the UPL. For households with wage-earners, 8 per cent of households were below the FPL but 13 per cent below the UPL. For households without wage-earners, 13 per cent were below the FPL and 29 per cent below the UPL. For the four low-income areas a whole, the estimates were 17 per cent of households below the UPL but only 9 per cent below the FPL.

With the exception of Gerehu and net donor households, the incidence of poverty at the FPL is lower for all groups than at the UPL. The difference in the incidence of poverty between the FPL and the UPL mirrors the difference found in Chapter 7 where there were greater inequalities in net consumption (the comparator metric for the UPL) than in food consumption (the comparator metric for the FPL).

Another way of looking at the poverty lines is to look at the percentage relationship between the relevant consumption measure per AE and each poverty line (the three right-hand columns in Table 28). For example, a household might have net food consumption per AE that was 80 per cent of the FPL. For households with and without wage-earners, there was no significant difference in

relation to the FPL. However, the difference between the two groups in relation to the LPL was significant at the 95 per cent level and in relation to the UPL at the 99 per cent level. This is also consistent with the study finding that there was no significant difference between households with and without wage-earners in net food consumption, although there was a difference significant at the 95 per cent level in overall consumption (Chapter 7). There were no significant differences in relation to any of the poverty lines between net donor and net recipient households. Looking at mean percentage values, only the lowest quartile households fell close to or below the poverty lines.

Table 28: Per cent of households below the poverty lines, and mean household consumption per AE as a per cent of the value of poverty lines, by group of households

Group of households	% of households			Mean consumption per AE as % of poverty lines		
	< FPL	< LPL	< UPL	FPL	LPL	UPL
With wage-earners	8	4	13	182 [a]	226 [b]	197 [c]
Without wage-earners	13	21	29	155 [a]	150 [b]	127 [c]
Lowest quartile	33	50	58	110	94	103
Net donors	0	0	0	181 [a]	221 [a]	192 [a]
Net recipients	17	20	33	161 [a]	168 [a]	144 [a]
Population of four low-income areas (est) [d]	9	9	17	175	205	179
Gerehu [e]	9	9	9	165	259	220

Notes. The per cent of households below each poverty line and the mean per cent of each poverty line are calculated by comparing for each household net food consumption per AE and the FPL, and net consumption per AE and the LPL and the UPL.

[a] Using the two tailed t-test, the difference between the mean per cent for households with and without wage-earners and between the mean per cent for net donor and net recipient households is not significant at the 95 per cent level.

[b] Using the two tailed t-test, the difference between the mean per cent for households with and without wage-earners is significant at the 95 per cent level.

[c] Using the two tailed t-test, the difference between the mean per cent for households with and without wage-earners is significant at the 99 per cent level.

[d] Adjusted for sampling fractions.

[e] Gordons Ridge poverty lines used for Gerehu since Gordons Ridge and Gerehu had fewer subsistence components of their food intake than Nine Mile. Poverty lines are set in relation to a basket of goods normally consumed by low-income households.

Using the one-way ANOVA test, differences between the four study areas in net consumption per AE as a percentage of the poverty lines were not significant at the 95 per cent level. The test was also run for households with wage-earners and households without wage-earners in each location, and again the differences in consumption per AE as a per cent of the poverty lines were not significant at the 95 per cent level.

The nearest household survey in time to this study where a poverty analysis is available is the Urban Household Survey in six urban areas in 1987–88 (Gibson, 1998). From this survey, Gibson calculated the incidence of poverty for the UPL in urban areas as 38 per cent, with 20 per cent for the LPL and 6 per cent for the FPL (Gibson, 1998, p. 11). The methodology used was the one adopted in this study. The 1987–88 figures seem high compared to those in this study of 17 per cent below the UPL and 9 per cent below both the LPL and FPL (Table 28) in four low-income areas where there were relatively high proportions of households without wage-earners. It would have been expected that across urban areas as a whole, the proportions living in poverty would be lower than in the study areas. It is possible that the methods used in this study, tracking a higher level of transfers than in other studies, the inclusion of meals given and received, and the good quality of information on subsistence produce, may have recorded higher levels of food and other consumption than the 1987–88 Urban Household Survey.

In this study, four households had total net consumption below the FPL, two in Biliau and two in Wagol (data from the household tables). They were what Gibson (1998, p. 10) calls the food-poor. These households did not have enough consumption resources even if they devoted 100 per cent of their consumption to food to meet the minimum calorie requirement. These four food-poor households in Madang were also at the bottom of the calorie and protein distributions. Adjusting for sampling fractions, the estimate for food-poor households in the low-income areas was 6 per cent.

There was also one household in Gerehu which was food-poor, with total net consumption falling below the FPL. Although the household gained some income from casual employment, the household head was without a permanent job at the time of the study.

There were a number of pointers to food distress in study households, particularly in Madang. Households sometimes only ate one meal a day. One household in Madang with several children under 10, ate only one meal a day for two weeks.

Another had ups and downs but on one bad day they had only four green coconuts and 10 ripe bananas for four adults, a 10-year-old, and a baby. In seven days, this household ate no animal protein except two eggs. In another, an old man ate his own yams until he was tired of them and would eat no more. He then stopped eating for two days. When he grew weak and dizzy, a neighbour bought him an egg and a cream bun and gave him a cup of tea and he revived.

Study households were offered a choice of gifts at the end of the consumption surveys. The choices included a large bag of rice as well as pans, kerosene lamps and other household durables. A number of households chose rice over durable items. During the study one household asked to receive their bag of rice early because they had had no food all day. We gave them the rice immediately and recorded it as an inwards transfer for that household.

Food adequacy and the FPL

Just over half of all households in the four low-income study areas (57 per cent) were estimated to fall below adequacy in calorie consumption and 41 per cent below adequacy in protein consumption (Table 24). The estimate for the low-income study areas for households below both calorie and protein adequacy was also 41 per cent. Using the poverty lines, the estimate for households below the FPL was 9 per cent for the four census units (Table 28).

Although different things are being measured, these are surprisingly large differences between measures of food adequacy and the FPL. The difference will have arisen at least in part because the FPL was set in line with the approach in other studies at the local price of 2,200 calories per AE based on the basket of foods consumed in the study areas. This level is lower than the level needed for an adequate overall minimum food budget including adequate protein.

The problem with leaving out protein requirements is illustrated by the different sources of calories and protein in study households set out in Tables 25 and 26 in this chapter. The top five sources of calories in study households, providing 67 per cent of all calories consumed, provided only 40 per cent of grams of protein consumed. The top six sources of protein, providing 69 per cent of all grams of protein consumed, provided 52 per cent of calories consumed. The largest divergences between sources of calories and protein were as follows: sago and sugar provided 19 per cent of calories but 1 per cent of grams of protein, while tinned fish provided 3 per cent of calories but 18 per cent of grams of protein.

Temporary or permanent consumption deficits?

The study was not designed to address the question of whether households found to be consuming inadequate food or living in poverty were temporarily or more permanently in this situation. Some possibilities can be noted but the study, looking at only a single point in time, cannot indicate which of these might be important:

- Household members could gain or lose employment over time. There was some loss of jobs during the study period, suggesting a fairly fluid situation for unskilled labour.
- Gaining or losing employment could affect households other than that of the person immediately concerned. Capacity to provide support to other households with close ties, such as households where older parents live, could also be affected.
- The availability of casual work could fluctuate and provide and then take away temporary opportunities for extra income.
- The data on levels of employment by age showed a decline in employment prospects once men reached 45 years of age.
- Over the life cycle of a household, children became old enough to find employment or otherwise bring in income for the household, adding to household income. Later these adult children might marry and leave their parents' household, and with competing calls on resources for their own children and in-laws, might reduce their support to their parents.
- The death of a male household head could leave a widow to support young children with reduced resources.
- Illness or disability can affect the incomes of households, sometimes on a permanent basis.
- Some households had the option to move location, either within urban areas to pursue income opportunities or greater social support, or to return to rural areas where subsistence income might ensure sufficient food. As already noted, the option to return to rural areas varied across urban areas and between groups. Those born and growing to adulthood in urban areas did not have rural options, and residents of traditional villages in urban areas also had fewer options for a change of residence.

Beyond the specific circumstances of households, the state of the economy, employment opportunities, levels of inflation and urban planning policies were all

factors affecting the economic wellbeing of households like the ones in this study. All of these factors were beyond the control of the households themselves. For example, the World Bank has shown how the contraction of the PNG economy led to increased levels of poverty nationally between 1996 and 2003 (World Bank, 2004, p. vii).

Chapter 9: The effects of transfers

This chapter draws together the different threads of the report and looks at the effects of transfers on the living standards of study households. The chapter looks in turn at the relationship of transfers to income, consumption, and poverty. As discussed at the end of Chapter 7, the best measures of living standards are measures of consumption rather than of income. However, income is included for completeness and as something of a contrast to the consumption outcomes. There were limitations in the poverty analysis arising both from the methodology adopted from other sources and from the attempt to replicate this methodology with study data. However, the effects of transfers on poverty in study households are included here because, while the levels of poverty may not be certain, the way transfers affect poverty can still be examined with study data. This chapter also looks at the implications of the study findings on transfers for understanding urban living standards.

When looking at the material on the effects of transfers in this chapter, it should be noted that the transfer system in each low-income census unit was anything but a zero-sum game. For transfers received by study households in the four census units, 53 per cent by value came from outside the census unit (Table 15). The proportion of outwards transfers going outside the census unit was the same. Many of these transfers were from and to other urban households. Some were from and to rural households.

Transfers and income

This study has shown that there was a negative relationship between earned income and net transfers in households without wage-earners, r = −0.5742, significant at the 95 per cent level (Chapter 6). Positive net transfers were flowing towards households with lower earned income. There was also a modest reduction from 0.46 to 0.42 in income inequalities measured by the Gini coefficient when net transfers were added to earned income to make disposable income (Table 16).

The effects of net transfers on income can also be considered in terms of the difference between earned income and disposable income, where disposable income is earned income plus net transfers (Table 29).

Table 29: The effect of net transfers on income over two weeks by group of households

Group of households	Earned income per AME	Disposable income per AME	Change in income per AME after net transfers
	kina	kina	%
With wage-earners	28.46 [a]	27.19 [b]	–4
Without wage-earners	11.89 [a]	14.60 [b]	23
Lowest quartile	5.22	9.00	72
Net donors	33.57	27.36	–19
Net recipients	13.09	17.93	37
Gerehu	63.50	56.61	–11

Notes. Disposable income = earned income + net transfers. Net transfers can have a positive or a negative value. Kina values for net donors, net recipients and Gerehu cannot be compared with those for other groups, but the change in income for each group can be compared.

[a] Using the two tailed t-test, the difference between the mean income per AME for households with and without wage-earners is significant at the 99 per cent level.

[b] Using the two tailed t-test, the difference between the mean income per AME for households with and without wage-earners is significant at the 95 per cent level.

On the one hand, households without wage-earners saw their incomes rise by 23 per cent after net transfers, net recipient households saw an increase of 37 per cent and the lowest quartile households saw an increase of 72 per cent. These are large increases in income, particularly for the lowest quartile households. On the other side of the ledger, the effect of net transfers on the income of households with wage-earners was to reduce income by 4 per cent and in net donor households by 18 per cent. In Gerehu the effect on net donor households was a reduction of 13 per cent.

Transfers and consumption

To look at the effects of transfers on consumption in a similar way, a proxy for the effects of net transfers on consumption has been calculated by comparing the value of net transfers to the value of consumption without net transfers as follows:

net transfers / (net consumption − net transfers) * 100

This formula is used for total net transfers and for components of net transfers (Table 30).

Table 30: The effect of net transfers per AME on net consumption per AME over two weeks by group of households

Group of households	Net consumption per AME	Total net transfers per AME	Net consumption minus net transfers per AME	Effect of total net transfers per AME	Effect of net cash transfers per AME	Effect of net transfers in kind per AME	Effect of net hospitality transfers per AME
	kina	kina	kina	%	%	%	%
With wage-earners	21.64 [a]	–1.27 [a]	22.91	–6	–2	6	–9
Without wage-earners	14.22 [a]	2.71 [a]	11.51	24	16	11	–3
Lowest quartile	9.93	3.78	6.15	61	28	28	5
Net donors	22.88	–6.22	29.10	–21	–8	–2	–12
Net recipients	15.43	4.84	10.59	46	24	23	–1
Gerehu	38.30	–6.89	45.19	–15	–12	10	–12

Notes. The effect of net transfers of different types is calculated as: net transfers per AME / (net consumption per AME – net transfers per AME) * 100.

Net hospitality transfers are calculated as: meals received + overnight hospitality received – meals given – overnight hospitality given.

Kina values for net donors, net recipients and Gerehu cannot be compared with those for other groups, but the effects of transfers for each group can be compared.

[a] Using the two tailed t-test, the difference between the mean per AME for households with and without wage-earners is significant at the 95 per cent level.

There is a hypothetical element in this approach. While the net transfers and net consumption figures after transfers are empirically based, it is not possible to know what consumption would have been without the transfers. If the poorer, net recipient households were doing everything they could to maximise consumption, the assumption that they would have consumed less by the amount of net transfers probably holds well enough. However, for households that were net donors, it may not be as reasonable to assume that when they made the transfers their consumption would have fallen by the same amount. These households may have been able to offset the transfers by drawing on savings, additional subsistence resources or loans to maintain consumption at least in the short term.

Three groups of households in Table 30, households without wage-earners, net recipient households and the lowest quartile, benefited considerably from net transfers. The effect of net transfers was to raise consumption by households without wage-earners by 24 per cent. Together with the effect of negative net transfers on households with wage earners (−6 per cent), the overall effect of transfers was to raise consumption per AME in households without wage-earners from around half to two thirds of the level in households with wage-earners. For net recipient households, consumption was raised by 46 per cent.

The largest effect of net transfers on consumption per AME was in the lowest quartile of households where the effect on consumption was an increase of 61 per cent. In the case of the lowest quartile the effect of net transfers on income was higher at 72 per cent than the effect of transfers on consumption (Table 29). Since exactly the same data on transfers is used in both cases for the same households, it must be that there was an underestimate of income in Table 29, as perhaps indicated by the fact that consumption per AME at K9.93 was higher than disposable income per AME at K9.00. This again suggests that consumption measures provide a more reliable measure of living standards than income measures in this study.

Table 30 also shows the other side of the transfers system, the negative effect on consumption in donor households, although, as discussed, some households may not have felt these effects in their consumption levels to the full extent of the net transfers. Households with wage-earners in the low-income areas may have reduced their consumption by up to 6 per cent as a result of net transfers. In net donor households in the low-income areas, the level of transfers was such as to reduce consumption by up to 21 per cent. These are significant numbers, which in combination with the effects of positive transfers on other groups of households have an impact on the distribution of consumption in the four low-income study

areas. The effect of transfers was to reduce inequalities when these were measured by consumption. As shown in Chapter 7, the Gini coefficient for net consumption per AME was 0.27 (Table 18), a considerably lower figure than the Gini coefficient for disposable income at 0.42 (Table 16).

Other studies using large-scale survey data have found similar types of effect of transfers (excluding meals and overnight hospitality transfers) on consumption. An analysis of the 1996 PNG household survey showed that net transfers in urban areas tended to reduce inequalities of consumption, with the effect being more marked in relation to net transfers within the day-to-day sphere (equivalent to the non-recall data in the consumption surveys in this study) (World Bank, 2000, p. 141).

There are different patterns in the effects of the three components of net transfers on net consumption per AME in Table 30. For net cash transfers, the pattern of effects on different groups of households was similar to the effects of net transfers as a whole. Net cash transfers had positive effects on households without wage-earners (16 per cent) net recipient households (24 per cent), and lowest quartile households (28 per cent). Net cash transfers had a negative effect on consumption among households with wage-earners (−2 per cent), net donor households (−8 per cent) and Gerehu households (a larger −12 per cent). As for net transfers as a whole, net transfers in cash tended to flow from households with more resources to those with less. A study in the Port Moresby urban village of Hanuabada in 1996 also found that cash transfers "go from the rich to the poor and act to reduce inequality" (Gibson et al., 1998, p. 46). Richer households in Hanuabada, as in the study areas, tended to be net donors of cash transfers, while poorer households were net recipients.

Net transfers in kind showed a different pattern of effects from cash transfers, with all groups of households being net recipients except the net donor households where consumption was reduced by 2 per cent. Households with more resources were still receiving a net benefit from transfers in kind. Thus, households with wage-earners gained a net 6 per cent, Gerehu households a net 10 per cent and for the four low-income areas as a whole the outcome was an estimated net 7 per cent. The poorer groups of households gained more than the others from net transfers in kind, with lowest quartile households gaining a net 28 per cent. This pattern arose because of two factors. The primary factor was the movement of transfers in kind from rural villages to the study areas, usually with visitors from the rural area. The second factor was subsistence production which provided households with the means of providing transfers in kind to other households.

The effects on consumption of transfers of meals and overnight hospitality (treated as a single hospitality variable in Table 30) turned out to be somewhat different from the effects of other types of transfer. Meals and overnight hospitality transfers had a negative effect on consumption in nearly all groups of households except the lowest quartile. Households without wage-earners which gained 24 per cent of net consumption from total transfers lost 3 per cent of net consumption from meals and overnight hospitality transfers. Net recipient households also lost slightly on meals and overnight hospitality transfers but gained 46 per cent from total transfers. Poorer households did not benefit from meals and overnight hospitality transfers in the way they benefitted from other kinds of transfer. As might be expected, households with more resources lost more on net meals and overnight hospitality transfers compared to their consumption than poorer households. Adjusting for sampling fractions, the net effect of meals and hospitality transfers on the four study areas as a whole was an estimated −7 per cent. The reason for the different impact of meals and overnight hospitality transfers was that many of these transfers were directed to visitors from rural villages and other locations rather than to relatives and neighbours in the census unit. There is an element of symmetry between transfers in kind and meals and hospitality. Visitors from rural areas gave transfers in kind to study households but received in return meals and overnight hospitality from them.

The upshot was that transfers in cash and kind tended to help poorer households and reduce consumption in households with more resources. Meals and overnight hospitality transfers on the other hand had potential negative effects on consumption in nearly all types of households. A consequence of the inclusion of this type of transfer in this study was not only to raise the overall value of transfers but also to distribute the impact of total net transfers in a different way across households. Meals and overnight hospitality transfers had a particularly negative effect on net donor households and Gerehu households (both −12 per cent).

Another way to look at the effects of net transfers is on the community as a whole, in this case the four low-income census units in this study. Adjusting for sampling fractions, for the four census units as a whole the estimated effect of net transfers was a change in net consumption per AME of −2 per cent. Just looking at this overall net effect at the community-wide level, it might appear that transfers were not making much difference. The most important effects of transfers on living standards can only be seen by looking at subgroups within the population. As this study has shown, it is only in subgroups that large effects of transfers on net consumption per AME can be found.

Transfers and poverty

The system of interhousehold transfers, also sometimes described as the *wantok* system in Pidgin, has been described as 'a safety net' for Papua New Guineans living in urban areas (for example, Monsell-Davis, 1993; World Bank, 2000, pp. 42–46; and Mawuli & Guy, 2007). At the time of designing this study, there appeared to be an assumption in government that the transfers system meant that nobody could be poor in urban PNG.

The current study found that despite the active system of transfers recorded in the four low-income areas, a number of households fell below the poverty lines. The estimates based on adjusting for the sampling fractions for the four low-income census units as a whole were: 9 per cent of households below the FPL; 9 per cent below the LPL; and 17 per cent below the UPL (Table 28).

Similar conclusions on the effects of the transfers system have been reached by other writers. The World Bank poverty assessment based on the 1996 PNG household survey concluded that "The importance of *wantoks* not withstanding [*sic*], there are limits to what these systems can achieve. In communities which are characterised by very high poverty rates, the possibilities for household transfers remain limited by low household incomes" (World Bank, 2000, p. 43). A similar but broader conclusion was reached by Guy:

> It is an error to assume that everyone has a *wantok* structure on which they can call, and that there are always *wantoks* within that structure who have access to resources and are able to share them to assist people in times of hardship. (Guy, 2007, p. 136)

The 1996 Hanuabada study also showed that, despite the system of transfers, there were still significant levels of poverty in Hanuabada (Gibson et al., 1998, p. 50).

Data by household from this study enabled a closer interrogation of the relationship between the transfers system and poverty, here considered in relation to the UPL. Using data by household from the household tables, Table 31 shows that across the 48 low-income sample households in this study:

- 10 households fell below the UPL, all of these having received positive net transfers; and
- of the remaining 38 households all above the UPL, 18 were net donors of transfers; among the 20 households that were net recipients of transfers, seven were only above the UPL because of positive net transfers and 13 would have been above the UPL even if they did not have positive net transfers.

Table 31: The relationship between net transfers and the UPL over two weeks by wage-earner status of household and for population of four low-income areas

Household characteristics in relation to the UPL and net transfers	Households with wage-earners		Households without wage-earners		Pop. of four low-income areas (est) [a]
	number	%	number	%	%
Households below the UPL					
< UPL and negative net transfers	0	0	0	0	0
< UPL and positive net transfers	3	13	7	29	17
Households above the UPL					
> UPL and negative net transfers	14	58	4	17	47
> UPL, positive net transfers and depended on positive net transfers to be above UPL	0	0	7	29	8
> UPL, positive net transfers and did not depend on positive net transfers to be above UPL	7	29	6	25	28
Total	24	100	24	100	100

Note. Figures calculated from data in the household tables on net transfers, adult equivalents, and net consumption per AE and from Table 27 on the UPL for each study area.

[a] Adjusted for sampling fractions.

The distribution of these households by wage-earner status (Table 31) shows the importance of transfers for providing adequate consumption for households without wage-earners. Among households without wage-earners, 29 per cent were above the UPL because of net transfers. Net transfers enabled these households to avoid poverty.

The 10 households below the UPL which were all receiving positive net transfers are of particular interest. These are the households which the transfers system did not 'save' from poverty. Looking closer at the circumstances of these 10 households through the data by household in the household tables, the households fell into two groups.

The first group was made up of seven households (one with a wage-earner and six without a wage-earner) which were very dependent on transfers for their disposable income (using data from the household tables), but still fell below the UPL. Five of these households derived more than 65 per cent of their disposable income from net transfers, and two others had 45 and 47 per cent of their disposable income from net transfers. Among a group of relatively poor people it was difficult for the transfer system to make sure that households that were very dependent on transfers had enough. Most of these households may well have been in the position of consumption deficit long term. For these seven households, the transfers system was helping but it was not enough to provide for adequate consumption.

The second group was made up of three households that derived 20 per cent or less of their disposable income from transfers (again, calculated from the household tables). Two of these households had very recently lost jobs and were classified as households with wage-earners in our sample selection. The third household was without a wage-earner. The reasons for the relatively low role of net transfers in disposable income for these households were not clear. For the two households where jobs had been lost, it could be that the transfers system had not had time to respond to their loss of jobs, or there may have been an expectation among those around them that another job would be found soon. Or it could have been that one or more of the households did not have established relationships of support on which they could draw or wished to draw.

This helps illustrate the ways the 'safety net' of the transfers system did or did not work. There were two main reasons for the failure of the 'safety net' to keep households above the poverty line:

- Kin and neighbours who were available to help poorer households had limited resources. The only slightly less poor were helping the poorest.
- The transfers system was not a universal system treating everyone's needs equally but a system built on individual donors balancing their own needs against the needs of others and taking decisions in the context of their own specific relationships of obligation and reciprocity.

The story of the transfers system had two sides. While a recipient household benefited from a transfer, a donor household risked going without something to make the transfer. To the extent that the transfers system tended to equalise consumption and reduce poverty, this came at a cost to those who were providing the transfers, many of whom were living at only a slightly higher standard than the people they were helping. The figures on food consumption were particularly remarkable in this regard. In the low-income areas there was no significant difference between food consumption per AME in households with and without wage-earners (Table 18). In terms of food consumption, donor households were reducing their food consumption to much the same level as recipient households.

Observations for future studies

The effects of transfers on living standards in the four low-income census units in this study were substantial. In net recipient households, transfers had the effect of nearly doubling net consumption per AME, raising it by 46 per cent (Table 30). In net recipient households, these effects mainly arose from transfers in cash and kind. In net donor households, transfers had the potential effect of reducing consumption per AME by up to one fifth. These reductions arose from all types of transfers, including meals and overnight hospitality.

By including the value of meals and overnight hospitality, the study added 20 per cent to the value of inwards transfers (excluding recall data) and 66 per cent to the value of outwards transfers (excluding recall data).

The normal method in household income and expenditure surveys of taking account of inwards and outwards visits by adjusting the value of AME in the household, does not show meals and overnight hospitality costs as transfers between households. As a result, the large and mainly negative effects of meals and overnight hospitality transfers on consumption in urban households are not recorded.

The effort put into the recording of subsistence income and transfers in kind is likely to have increased the value recorded for these items compared to large-scale surveys, although the amount of this increase cannot be estimated.

In this study transfers had a major impact on urban living standards in poorer households, whether these households were net donors or net recipients of transfers. The more information that is available on transfers and the broader the definition of transfers used, the more accurate the picture of the effects of transfers on urban households.

To the extent that transfers in urban households are underestimated in any study, consumption and poverty in net recipient households will be underestimated and in net donor households it will be overestimated. This will in turn distort the picture of the distribution of consumption and affect the levels of poverty identified.

Appendix I: About the household tables

The household tables

Six tables in spreadsheet format showing data by household are provided in a separate electronic file provided with this report. They are referred to in this report as 'the household tables'. The purpose of providing these tables is to enable other researchers to interrogate the data for their own purposes.

The tables are as follows:

Table H1: Data by household over two weeks, households with wage-earners
Table H2: Data by household over two weeks, households without wage-earners
Table H3: Data by household over two weeks, Gerehu households
Table H4: Data by household over two weeks, lowest quartile households
Table H5: Data by household over two weeks, net donor households
Table H6: Data by household over two weeks, net recipient households

The remainder of this appendix contains information needed to understand and interpret these tables.

Variables in the household tables

The variables are arranged from left to right in the household tables as follows:

- household characteristics, columns A to G;
- income variables, columns H to M;
- inwards transfers variables, columns N to R;
- outwards transfers variables, columns S to W;
- consumption variables, columns Y to AF; and
- adequacy of consumption variables, columns AG to AP.

Codes for qualitative variables in the household tables

Codes used for qualitative variables in the household tables are set out in Table 32.

Table 32: Codes for qualitative variables in the household tables

Column	Name of variable	Code	Description of code	Code	Description of code
A	Location	1	Nine Mile	4	Biliau
		2	Gordons Ridge	5	Wagol
		3	Gerehu		
D	Sex of household head	1	Male	2	Female
E	Age of household head	1	Under 20	4	40-49 years
		2	20-29 years	5	50-59 years
		3	30-39 years	6	60 years and over
F	Place of birth of household head (province)	1	Western	11	Eastern Highlands
		2	Gulf	12	Morobe
		3	Central	13	Madang
		4	National Capital	14	East Sepik
		5	Milne Bay	15	West Sepik
		6	Northern	16	Manus
		7	Southern Highlands	17	New Ireland
		8	Enga	18	East New Britain
		9	Western Highlands	19	West New Britain
		10	Chimbu	20	North Solomons
G	Wage-earner status of household	1	No wage-earner	4	One, secondary education
		2	One, no education	5	One, tertiary education
		3	One, primary education	6	Over one

Derivation of quantitative variables in the household tables

The sources for the quantitative variables in the household tables are summarised in Table 33 for ease of reference. No entry or derivation is provided for the qualitative variables described in Table 32. Further information can be found in Appendix II.

Table 33: Derivation of quantitative variables in the household tables

Column	Variable name in the household tables (name in text of report if different)	How variable derived
C	Household size in AME	AME analysis, Appendix II
H	Income from employment	Taken directly from transaction records
I	Informal sector income	Taken directly from transaction records
J	Subsistence income	Taken directly from transaction records
K	INCOME1 (earned income)	H + I + J
L	NETTS (net transfers)	R - W (negative value possible)
M	INCOME2 (disposable income)	K + L
N	Cash transfers received	Taken directly from transaction records
O	Transfers in kind received	Taken directly from transaction records
P	Meals received	Hospitality analysis, Appendix II
Q	Non-food hospitality received	Hospitality analysis, Appendix II
R	INTS (inwards transfers)	N + O + P + Q
S	Cash transfers given	Taken directly from transaction records
T	Transfers in kind given	Taken directly from transaction records
U	Meals given	Hospitality analysis, Appendix II
V	Non-food hospitality given	Hospitality analysis, Appendix II
W	OUTTS (outwards transfers)	S + T + U + V
X	DEPONTS (dependence on transfers)	L / M (negative value possible)
Y	GR3CONS (gross consumption)	AC + AE + O + P + Q + J + AD
Z	NET3CONS (net consumption, consumption)	Y – T – U – V – AF
AA	N1FOOD	Consumption analysis, Appendix II
AB	N3FOOD (net food consumption)	Y – T – U – V – AF (food items)
AC	Opening stock	Taken directly from transaction records
AD	Cash expenditure	Taken directly from transaction records
AE	Income in kind	Taken directly from transaction records
AF	Closing stock	Taken directly from transaction records
AG	PCENTCAL1 (per cent of calories required that were consumed (study method))	Nutrition analysis, Appendix II
AH	PCENTCAL2 (per cent of calories required that were consumed (updated method))	AG * 1.206
AI	PCENTPROT1 (per cent of grams of protein required that were consumed (study method))	Nutrition analysis, Appendix II

Column	Variable name in the household tables (name in text of report if different)	How variable derived
AJ	PCENTPROT2 (per cent of grams of protein required that were consumed (updated method))	AI * 0.728
AK	Adult Equivalent	C * 1.13
AL	N3FOOD/Adult Equivalent	AB / AK
AM	N3CONS/Adult Equivalent	Z / AK
AN	% FPL	AL / FPL * 100
AO	% LPL	AM / LPL * 100
AP	% UPL	AM / UPL * 100

Appendix II: Additional information on methods

This appendix supplements the material on methods in Chapter 2 with information presented under headings that match some of those in Chapter 2.

Selection of consumption survey sample

There was good congruence between the profile sought and the final sample selection for the consumption surveys. When it came to households without wage-earners, the number of households in the population was smaller than for households with wage-earners. This made it more difficult to achieve the exact profile sought in each case.

For the low-income census units, the results according to the eight profiles sought were as follows:

- *Province of birth of household head:* all profiles achieved.

- *Age of household head:* three achieved, five were not achieved but a spread was maintained across age groups with adjacent age groups used where possible. The profile was probably set too narrowly for age groups.

- *Sex of household head:* all profiles achieved.

- *Were there female residents?* Seven profiles achieved; in one sample a household without females could not be included where one was sought.

- *Main source of cash income:* five profiles achieved, three households without wage-earners profiles not achieved in terms of numbers relying on transfers and informal sector income, but all types of non-employment income were represented.

- *Number and education level of wage-earners in households with wage-earners:* all four profiles achieved (four rather than eight profiles because only for wage-earner households).

The Gerehu sample was reduced from 12 to 11 when one household dropped out after the consumption survey had commenced. The main effect against the profiles sought was that there was no household head who was over 40 years of age. The other criteria were not significantly affected.

Data analysis: variables by household

Each household transaction record in the consumption data base (collected in 14-day diary, stocktakes, and recall period) was categorised as one of the following:

01 opening stock;
02 cash income received from employment and the informal sector;
03 income in kind received from employment and the informal sector;
04 cash transfers received, survey period;
05 transfers in kind received, survey period;
06 cash transfers received, recall period;
07 transfers in kind received, recall period;
08 meals received;
09 overnight hospitality received;
10 subsistence production;
11 cash expenditure;
12 transfers in cash given, survey period;
13 transfers in kind given, survey period;
14 transfers in cash given, recall period;
15 transfers in kind given, recall period;
16 meals given;
17 overnight hospitality given;
18 closing stock;
19 AME for normal residents.

Records were aggregated for each household on a two-week basis.

The capitalised acronyms used below, such as INCOME1, are the labels used for variables in the household tables and in formula for variables below.

Income analysis

Earned income (INCOME1) = 02 + 03 + 10.

Disposable income (INCOME2) = earned income + 04 + 05 + 08 + 09 − 12 − 13 − 16 − 17.

More simply, disposable income = earned income + net transfers (net transfers can have a positive or a negative value).

Transfers analysis

Inwards transfers (INTS) = 04 + 05 + 06 + 07 + 08 + 09.

Outwards transfers (OUTTS) = 12 + 13 + 14 + 15 + 16 + 17.

Note that for calculations by household and most aggregates recall data is excluded from net transfers (this is indicated in tables and text as appropriate), so that:

- INTS = 04 + 05 + 08 + 09;
- OUTTS = 12 + 13 +16 + 17; and
- Net transfers (NETTS) = 04 + 05 + 08 + 09 − 12 − 13 − 16 − 17.

Note that NETTS can have a positive or a negative value.

Dependence on transfers (DEPONTS) = NETTS / INCOME2 by household. DEPONTS can have a positive or a negative value.

Consumption analysis

Net 1 consumption (N1CONS) (used only in hospitality analysis described below) = 01 + 03 + 05 + 10 + 11 − 13 − 18.

- Net1food consumption (N1FOOD) = N1CONS where items were food items, including alcohol, beer, and soft drinks.
- Net1non-food (N1NFOOD) = N1CONS where items were non-food consumables associated with daily living such as cigarettes, tobacco, betel nut, cleaning items and other household consumables used on a daily basis.

Net 2 food consumption (N2FOOD) (used only in nutrition analysis described below) = 01 + 03 + 05 + 10 + 11 − 13 − 18 for food items.

Net 3 consumption (N3CONS) (described as net consumption in the text) = 01 + 03 + 05 + 08 + 09 + 10 + 11 − 13 − 16 − 17 − 18. This was the main measure of consumption by normal residents.

- N3FOOD is N3CONS applied to food items only, including alcohol, beer, and soft drinks.
- N3FOOD can also be calculated as N1FOOD + 08 − 16.

Gross 3 consumption (GR3CONS) (described as gross consumption in the text) = 01 + 03 + 05 + 08 + 09 + 10 + 11. This is a measure of resources available to a household before outwards transfers (transfers in kind, meals given, overnight hospitality given) and closing stock are deducted.

Adult Male Equivalent analysis

In this study, as in the HES (BOS, 1977, Bulletin 1, p. 7), normal residents were defined as persons who usually lived in a household or had stayed or expected to stay in a household three months or longer. Also, as in the HES, visitors were defined as persons who either ate a meal or stayed overnight in a household where they were not a normal resident. A visitor included a person who had been staying in a household other than their own for less than three months.

The value of AME for each normal resident and visitor in a household was defined in terms of the lowest foodcost study methodology developed by the BOS (1980b) (Table 34).

Table 34: Values for AME used in study

Age in years	Males	Females, including lactating females	Pregnant females
< 1	0.32	0.32	
1	0.38	0.38	
2	0.44	0.44	
3	0.49	0.49	
4	0.54	0.54	
5	0.59	0.59	
6	0.63	0.63	
7	0.67	0.67	
8	0.71	0.71	
9	0.75	0.75	
10-12	0.86	0.78	
13-15	0.96	0.83	0.97
16-19	1.02	0.79	0.93
20 and over	1.00	0.75	0.90

Note. From BOS, 1980b, p. 7.

In the study, values for a few cases were estimated where relevant data were not available. For persons where it was not clear whether they were 20 and over or 16–19 the rate for adults 20 and over was used. This usually occurred with visitors to study households who were not present at the time of the daily interview. One household was feeding a small pig which was counted as a child aged 2.

The following six types of AME were defined to enable the calculation of meals and overnight hospitality transfers, as well as the AME value of normal residents:

AME1: for food eaten in the household by normal residents;

AME2: for food eaten in the household by visitors (whether or not overnight visitors);

AME3: for food eaten in other households by normal residents;

AME4: for nights slept in the household by visitors;

AME5: for nights slept in other households by normal residents; and

AME6: for nights slept in the household by normal residents.

Variable 19 (AME for normal residents, used in most per AME calculations) = AME1 + AME3.

These types of AME were calculated from detailed information in the consumption surveys for every normal resident and for every visitor to a study household for every day. Data collected included the number of meals in a household in a day where three values were possible: one, two or three. The AME value for each person was taken from Table 34 above. In the following calculations, AME refers to the AME value for a person from Table 34.

AME1 was calculated for each person for each day of the two-week consumption period as follows:

- where the person was at home for all meals, AME1 = AME * 0.071 (for a single day calculated as 1 / 14 over two weeks);
- where the person ate one or more meals in other households
    - and there was one meal in the study household for that day, AME1 = 0;
    - and there were two meals in the household for the day, AME1 = AME * (2 − number of meals missed) * 0.036 (calculated as 1 / 14 / 2);
    - and there were three meals in the household for the day, AME1 = AME * (3 − number of meals missed) * 0.024 (calculated as 1 / 14 / 3).

AME2 = AME * 0.071 * number of meals eaten by visitor / number of meals eaten by household.

AME3 = AME * 0.071 * number of meals missed / number of meals eaten by household.

AME4 = AME * 0.071.

AME5 was calculated as follows:

- where the person slept at home AME5 = 0;
- where the person slept in another household AME5 = AME * 0.071.

AME6 was calculated as follows:

- where the person slept at home AME6 = AME * 0.071;
- where the person slept in another household AME6 = 0.

Meals and hospitality analysis

This analysis was designed to provide values for meals given and received and overnight hospitality given and received for every study household, items 08, 09, 17 and 18. The value of meals and overnight hospitality received and given was calculated from N1FOOD and N1NFOOD in the study household and the AME defined as above.

The calculation assumes that the value of food and overnight hospitality consumed in other households is the same as the value that would have been consumed if the normal resident of the study household had stayed at home. While this assumption is not ideal it is the best that could be made without a large amount of effort being made to collect data on other households visited by the normal residents of study households.

For every household:

- 08 meals received = N1FOOD * AME3 / (AME1 + AME2).
- 09 overnight hospitality received = N1NFOOD * AME5 / (AME4 + AME6).
- 17 meals given = N1FOOD * AME2 / (AME1 + AME2).
- 18 overnight hospitality given = N1NFOOD * AME4 / (AME4 + AME6).

Nutrition analysis

This analysis was designed to calculate how far study households were receiving the calories and grams of protein they required. For each household over two weeks this was calculated as:

- per cent calories (PCENTCAL1) = calories available / calories required * 100;
- per cent protein (PCENTPROT1) = grams of protein available / grams of protein required * 100.

For calories and grams of protein available to a household over two weeks the sum of the following formulae were used for each of 41 food items:

- Calories available = N2FOOD * calorie yield of food item / price of food item.
- Protein available = N2FOOD * protein yield of food item / price of food item.

The variables used were derived as follows:

- N2FOOD is defined above and is the kina value of consumption for each food item in each household over two weeks, where meals given and received are not accounted for.
- There was a list of 41 food items found to be eaten by households defined either per kg (for example, 1kg rice) or by a standard packaged item (for example, 777 brand tinned mackerel, 425g).
- The calorie and protein yield for each food item was calculated using information from WHO (1969) for 35 items and for six cooked food items not covered there, from Thomas and Corden (1970).
- For each food item a price by location was used, except for Biliau and Wagol where the same prices were used.

For calories and grams of protein required by each household for each day over two weeks the sum of the following was used:

- for each normal resident, their requirement * (maximum meals − number of meals missed) / maximum number of meals in household);
- for each visitor eating a meal in the household their requirement * (number of meals eaten / maximum number of meals in in household);

where the requirement for each normal resident and visitor was defined as in the lowest foodcost study (BOS, 1980b) (Table 35).

In Chapter 8, there is a description of alternatives to the study methods for calculating calorie and protein requirements in the sections headed 'Calorie requirements (updated method)' and 'Protein requirements (updated method)'. Where these updated methods are used, the food adequacy for calories and protein for each household are shown as PCENTCAL2 and PCENTPROT2 in the household tables.

Table 35: Recommended daily energy and protein requirements by age and sex

Sex	Age in years	Pregnant (P), lactating (L) [a] or neither (X)	Energy in kcal	Protein in grams
M	20 and over	X	3.000	37.0
M	16-19	X	3.070	38.0
M	13-15	X	2.900	37.0
M	10-12	X	2.600	30.0
M and F	7-9	X	2.190	25.0
M and F	4-6	X	1.830	20.0
M and F	1-3	X	1.360	16.0
F	20 and over	X	2.200	29.0
F	20 and over	P	2.550	38.0
F	20 and over	L	2.944	47.5
F	16-19	X	2.310	30.0
F	16-19	P	2.660	38.0
F	16-19	L	2.660	38.0
F	13-15	X	2.490	31.0
F	13-15	P	2.840	38.0
F	13-15	L	3.234	47.5
F	10-12	X	2.350	29.0

Note. From BOS, 1980b, Appendix Table 1, drawing on WHO, 1974.

[a] Requirements for a lactating mother included requirements for her child under one year of age, over and above those requirements met by the mother's milk.

Data analysis: adjusting for sampling fractions

There was a deliberate decision to sample the same number of households with and without wage-earners to make sure there were sufficient data on the poorer households. Estimates can be made for the four census units as a whole using the relationship between sample and household surveys data (Table 36).

To the extent that sample households without wage-earners and households with wage-earners were representative of the two groups of households in the census units, it was possible to make estimates for the four census units as a whole. To arrive at an average value for all households in the four census units an adjustment for the different sampling fractions in the two strata was made as follows:

where:

X is the average for all households with wage-earners;

Y is the average for all households without wage-earners; and

Z is the average for the total population of the four census units;

then:

Z = (X * 304 + Y * 111) / 415.

Table 36: Consumption survey sample size and total number of households in the four low-income areas

Group of households	Households with wage-earners	Households without wage-earners	All households
Nine Mile			
household survey	71	29	100
sample	6	6	12
Gordons Ridge			
household survey	166	41	207
sample	6	6	12
Biliau			
household survey	35	30	65
sample	6	6	12
Wagol			
household survey	32	11	43
sample	6	6	12
All four low-income areas			
household surveys	304	111	415
samples	24	24	48

As discussed in Chapter 2, this method was not used for variables expressed in kina values and subject to price differences between study areas (Type 1 in the section on the treatment of price differences between study areas in Chapter 2), for example for disposable income per AME.

Data analysis: Gini coefficient calculation

Two study specific adjustments were made before the Gini coefficient was calculated. Price differences between study areas were incorporated in the

calculation by using the differences in prices reflected in the UPL calculated in Chapter 8 for each study area. The method used also incorporated weighting for sampling fractions in order to arrive at a Gini coefficient reflecting the distribution of income and consumption in the four census units as a whole.

The steps in the calculation were:

1. For each of the 48 low-income sample households, the value of the income variable (y) was adjusted for the difference in prices between the four areas using the UPL for each area, where the adjustments were:

   - Nine Mile = 17.72 / 12.39 = 1.4302;
   - Gordons Ridge = 1;
   - Biliau = 17.72 / 7.08 = 2.5028; and
   - Wagol = 17.72 / 6.77 = 2.6174.

2. The frequency (x) per case was adjusted by the weighting of households with and without wage earners within the population of the four census units, where the adjustments were:

   - each household with wage-earners was multiplied by 304 / 24 = 12.67;
   - each household without wage-earners was multiplied by 111 / 24 = 4.63.

3. The cases were sorted from smallest to largest by value of income variable (y) as adjusted in Step 1.

4. Cumulative income (cum y) and cumulative household frequency (cum x) columns were created.

5. The area under the Lorenz curve was calculated for each case as (a − b) * (c + d) / 2, where:

   a = the value of x for the current case;
   b = the value of x for the previous case in the distribution;
   c = the value of y for the current case; and
   d = the value of y for the previous case in the distribution.

6. All the areas calculated in step 5, were summed giving the total area under the curve (B).

7. Area A between the curve and the line of equality was calculated as 0.5 − B.

8. Gini coefficient = A / 0.5.

Data analysis: construction of poverty lines

Food Poverty Line

The FPL was calculated for each of the four study areas separately as follows:

- The minimum food requirement for the FPL was set at a minimum consumption standard of 2,200 calories per AE multiplied by 14 for a two-week period, a total of 30.8 kcal.

- The basket of food items from which the calories required at the FPL were to be obtained was based on the actual sources of calories recorded for each study area as set out in Table 25 in Chapter 8.

- The consumption patterns of all 12 low-income sample households were the basis for the basket of food items for the FPL in each area. The method used for larger studies is to use the basket of food as consumed by the lowest quartile of households. Sample households in low-income areas in this study may well have been equivalent to the lowest quartile in urban areas as a whole, especially considering that half of all the 48 low-income sample households were without wage-earners.

- The method for constructing the basket was that outlined in Schmidt et al., 2020, p. 178. The foods yielding approximately 90 per cent of calories consumed in each area were selected. This avoided minor items only consumed by a few households being included in the basket.

- The formula for calculating (e), the price for each food item in the FPL basket of foods for each study area, was:

  where:
  - a = the calorie consumption over two weeks for all 12 households for that food item;
  - b = the total calorie consumption for approximately the top 90 per cent of food items;
  - c = the kcal required for that item to meet the 30.8 kcal requirement = a / b * 30.8; and
  - d = the price per kcal for that item from local pricing surveys and kcal yield for the priced item (see nutrition analysis above);

  then:
  - e = c * d.

- A worked example for rice at Nine Mile would be: where a = 866.8 kcal, b = 2687.1 kcal, c = 9.935 kcal, and d = K0.13, then e = K1.29.

- The total cost of the FPL for each area was the sum of e values for each food item in the FPL basket of foods for that area.

Lower Poverty Line and Upper Poverty Line

The LPL and UPL were designed to provide a minimum standard for total consumption, allowing for some non-food consumption above the FPL. They are calculated from the FPL as a base. The method used by the World Bank for calculating the LPL and the UPL from the FPL, was to identify households where total consumption exactly matched the FPL for the LPL and where the FPL exactly matched food consumption for the UPL. For each of these the ratio of food to non-food consumption was calculated to provide the LPL or the UPL.

In this study there were insufficient households in the sample to use study data to construct the LPL and the UPL above the FPL. There were no households in the study at the two points usually used to construct the LPL and UPL. As a result, the relationship between the FPL on the one hand and the LPL and UPL on the other in Gibson's analysis of the 1996 household survey for the National Capital District and urban areas in the Momase region (covering urban areas in Morobe, Madang and the East and West Sepik provinces) was used to provide the inflation factors for Port Moresby and Madang respectively (Gibson, 2012, pp. 4–6, preferred to World Bank, 2000 because the figures as in this study excluded consumption of durable goods and dwellings). The figures used to calculate the UPL, and LPL from the FPL were:

- for Port Moresby, 1.374 for the LPL and 1.615 for the UPL; and
- for Madang, 1.319 for the LPL and 1.478 for the UPL.

These poverty lines were then compared with consumption levels in study households (Table 28). The study variables used for comparison were net food consumption for the FPL and net consumption for the LPL and the UPL. To provide comparability with the later poverty studies, study AME were converted to AE. The definition of AE food requirements reported in World Bank, 2000 (pp. 88–92) was used where all persons required 2,200 calories except children 0 to 6 years of age who required 0.5 of that amount. A multiple of 1.13 was used to

convert study AME to AE, this being the actual multiple for the Nine Mile sample where original household composition data had been retained. The conversion from AME to AE is discussed more fully in the section in Chapter 8 entitled 'Calorie requirements (updated method)'.

Appendix III: Survey forms

The three forms in this appendix are:

- the household survey form (two pages), used once with each household in the five study areas;
- the consumption survey form (11 pages), used daily for 14 days with each household in the consumption survey sample; and
- the recall survey form (13 pages), used once with each household in the consumption survey sample.

HOUSEHOLD SURVEY FORM

1. **NAME OF PERSON**
   Name of everyone sleeping here last night?

   HOUSEHOLD & PERSON NO.

2. **SEX**
   Male or female?
   1. male 2. female

3. **YEAR OF BIRTH**
   When were you born?

4. **PLACE OF BIRTH**
   Where were you born?
   village:
   district:
   province:

5. **[ASK ONLY IF NOT BORN IN TOWN] YEAR FIRST CAME TO TOWN**
   When did you firstcome to live in this town?

6. **ECONOMIC ACTIVITY**
   Last week, what did you do most of the time?
   See below

7. **[ECONOMIC ACTIVITIES 01 TO 04 ONLY] TYPE OF JOB OR BUSINESS**
   What kind of work (or business) do you have?

8. **[ECONOMIC ACTIVITIES 01 & 02 ONLY] TYPE OF EMPLOYER**
   Who do you work for?
   See below

9. **EDUCATION**
   What kind of schooling have you had?

10. **[ASK ONLY IF NOT SURE] NORMAL RESIDENT OR VISITOR**
    How long has he/she been living with you?
    1 norm.res. 2 vis.

ECONOMIC ACTIVITIES
01 Worked at a wage job
02 On leave or temporarily absent from work
03 Big or small 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 (including 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

EDUCATION
01 no formal education
02 grades 1-5 only
03 up to grade 6 only
04 grades 7-10 only
05 grades 11-12 only
06 apprenticeship, diploma, certificate
07 degree (not completed)
08 degree (completed)
09 other course

DATE:

NO. PAGES
THIS H'HOLD

PAGE

136

Household no.
1 2 3

sex
4

year of birth
5 6

place of birth
7 8 9 10

no.norm.res.
11 12

no.visitors
13 14

cash income
15 16

1. CASH INCOME: *What activity did you get most of your money from last week?*

wages 01
PMV business.......02
retail store.......03
food marketing.....04
transfers 05

other ____

2. SUBSISTENCE ACTIVITIES NOW: *Last week, did anyone in this household do any of the following things to provide food for this household?*

FISHING
17

GARDENING
18

SEA OR RIVER COLLECTING
19

BUSH COLLECTING
20

HUNTING
21

OTHER MAIN: ____
22

3. SUBSISTENCE ACTIVITIES DURING YEAR: *During the year, did anyone in this household do any of the following things to provide food for this household?*

FISHING
23

GARDENING
24

SEA OR RIVER COLLECTING
25

BUSH COLLECTING
26

HUNTING
27

OTHER MAIN: ____
28

Number of female residents
29 30

31

wage-earners by education

Codes
1. no wage earners
2. one, no education
3. one, primary education
4. one, secondary education
5. one, beyond Gr. 10
6. more than one wage-earner

NOTES ON INTERVIEW

Language spoken?

CONSUMPTION SURVEY FORM

Clarification of indistinct codes

The reproduction of the consumption survey form is poor in some places so where the codes in boxes are indistinct, they are repeated here for clarity.

RELATIONSHIP / REL

    01   Man's Fa (father) or Mo (mother)
    02   Woman's Fa (father) or Mo (mother)
    03   So (son) or SoWi (son's wife)
    04   Da (daughter) or DaHus (daughter's husband)
    05   Bro (brother) or BroWi (brother's wife)
    06   Sis (sister) or SisHus (sister's husband)
    07   Other kin
    08   Church official
    09   Non-kin

PLACE OF RESIDENCE / PLACE R / PL. R

    01   This c.u. (census unit)
    02   This town
    03   Other town
    04   Village
    05   RNV (Rural non-village)
    06   Outside PNG

PLACE OF BIRTH / PLACE B / PL. B

    01   This town
    02   Other town
    03   Same village
    04   Same province
    05   Other province
    06   Rural non-village (RNV)
    07   Other country

PLACE OF PURCHASE

01   Store in this c.u. (census unit)
02   Supermarket
03   Other store
04   Market
05   Informal this c.u. (census unit)
06   Other informal
07   Other

Papua New Guinea

Institute of Applied Social and Economic Research

URBAN HOUSEHOLD CONSUMPTION SURVEY

Project Leader: Dr. Louise Morauta

Field Officer: Mr. John Kambu

Data Analysis: Mr. Lazarus Masavi

                   Ms. Linda Newell

November 1982 - September 1983

HOUSEHOLD COMPOSITION: NORMAL RESIDENTS

CODING GUIDE:

Type N.R H'hold No. Day

RELATIONSHIP
01 Man's Fa or Mo
02 Woman's Fa or Mo
03 Sp or Souse
04 Da or Dalta
05 Bro or Brodi
06 Sis or Sistlaw
07 other kin
08 church official
09 Non-kin

PLACE R.
01 This c.n.
02 This town
03 Other town
04 Village
05 RNV
06 Outside PNG

PLACE B.
01 This town
02 Other town
03 Same village
04 Same province
05 Other province
06 RNV
07 Other country

NAME	REF. NO.	YEAR BORN	SEX	P or L HERE ALL DAY	SLEPT AWAY LAST NIGHT			NO. MEALS IN H'HOLD TODAY	MEALS AWAY: 1ST HOST				MEALS AWAY: 2ND HOST			
					REL.	PL.R	PL.B		No. of meals missed	REL.	PL.R	PL.B	No. of meals missed	REL.	PL.R	PL.B
	8 9	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		
1.																
2.																
3.																
4.																
5.																
6.																
7.																
8.																
9.																
10.																

HOUSEHOLD COMPOSITION: NORMAL RESIDENTS

CODING GUIDE:

Type | N.R | H'hold No. | Day

RELATIONSHIP
01 Husb'a, Fa or Mo
02 Woman's Fa or Mo
03 So or SoWi
04 Da or DaHus
05 Bro or BroWi
06 Sis or SisHus
07 other kin
08 church official
09 Non-kin

PLACE R.
01 This c.u.
02 This town
03 Other town
04 Village
05 RNV
06 Outside PNG

PLACE B.
01 This town
02 Other town
03 Same village
04 Same province
05 Other province
06 RNV
07 Other country

NAME	REF. NO.	YEAR BORN	SEX	P or L	HERE ALL DAY	SLEPT AWAY LAST NIGHT			NO. MEALS IN H'HOLD TODAY	MEALS AWAY: 1ST HOST				MEALS AWAY: 2ND HOST			
						REL.	PL.R	PL.B		No.of meals missed	REL.	PL.R	PL.B	No.of meals missed	REL.	PL.R	PL.B
	8 9	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	
11.																	
12.																	
13.																	
14.																	
15.																	
16.																	
17.																	
18.																	
19.																	
20.																	

HOUSEHOLD
COMPOSITION:
VISITORS

Type   Vis   H'hold   Day

NAME	REF. NO.	YEAR BORN	SEX	P or L	RELATIONSHIP	PL. R	PL. B	SLEPT HERE LAST NIGHT	NO. MEALS EATEN HERE BY VISITOR TODAY	MAXIMUM NO. OF MEALS IN THIS H'HLD TODAY
	8 9	10 11	12	13		14 15 16 17	18 19	20	21	22
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10										

01 Male's Father or Mother
02 Woman's Father or Mother
03 Son or SoWi
04 Dau or DauHu
05 Bro or BroWi
06 Sis or SisHu
07 other kin
08 church official
09 Non-kin

01 this town
02 this town
03 Other town
04 Village
05 RtV
06 Outside PNG

01 this town
02 Other town
03 Same village
04 Same province
05 Other province
06 RtV
07 Other country

B. CASH
INCOME

Has anybody in this household earned any cash today or used any cash from savings?

1	2	3		4	5

H'hold No.   Day No.

Type & Ref. No.	AMOUNT RECEIVED	Source: *how did you earn this money?*
6 7 8 / B O 1	8 9 10 11 12	13 14
B O 2		
B O 3		
B O 4		

C. INCOME
IN KIND

Has anybody in this household earned any income in kind today, such as free meals or transport to work?

1	2	3		4	5

H'hold No.   Day No.

Type & Ref. No.	ITEM	Source: *how did you get these things?*	QUANTITY – WEIGHT	QUANTITY – UNIT NO. (if value not known)	VALUE IF KNOWN
6 7 8 / C O 1	9 10 11 12	13 14	15 16 17 18	19 20	21 22 23 24 25
C O 2					
C O 3					
C O 4					

D. CASH TRANSFER RECEIVED — *Has anybody in this household received any cash gifts today (K10, K1 or even 20t?)*

1	2	3	4	5

H'hold No.   Day No.

CODING GUIDE:

01 Man's Fa or Mo	01 This c.u.	01 This town
02 Woman's Fa or Mo	02 This town	02 Other town
03 So or SoWi	03 Other town	03 Same village
04 Da or DaHus	04 Village	04 Same province
05 Bro or BroWi	05 RNV	05 Other province
06 Sis or SisHus	06 Outside PNG	06 RNV
07 other kin		07 Other country
08 church official		
09 Non-kin		

Type & Ref. No.	AMOUNT RECEIVED	RELATIONSHIP of donor to head of this household	PLACE OF RESIDENCE of donor	PLACE OF BIRTH of donor
6 7 8	9 10 11 12 13	14 15	16 17	18 19
D O 1				
D O 2				
D O 3				
D O 4				

E. TRANSFERS IN KIND RECEIVED — *Has anybody in this household received any gifts in kind today (for example, food, cooked food, transport)?*

1	2	3	4	5

H'hold No.   Day No.

Type & Ref. No.	ITEM	QUANTITY: WEIGHT	QUANTITY UNIT NO.	VALUE IF KNOWN	RELATIONSHIP of donor to head of this household	PLACE OF RESIDENCE of donor	PLACE OF BIRTH of donor
6 7 8	9 10 11 12	13 14 15 16	17 18	19 20 21 22 23	24 25	26 27	28 29
E O 1							
E O 2							
E O 3							
E O 4							
E O 5							

F. HOME PRODUCE FOR OWN USE OR TRANSFERS

Has anybody in this household produced any food or other items today for use in this household or to give to other people? (prompt: coconuts, garden food, fish, firewood)

H'hold No. Day No.

Type & Ref. No.	ITEM	QUANTITY WEIGHT (if value not known)	QUANTITY - UNIT NO.	VALUE IF KNOWN
F 0 1				
F 0 2				
F 0 3				
F 0 4				
F 0 5				
F 0 6				
F 0 7				
F 0 8				
F 0 9				
F 1 0				

H. CASH EXPENDITURE

Has anybody in this household spent any money today on goods or services? (e.g. food, transport, newspapers, lunch at work)

1	2	3		4	5

H'hold No.   Day No.

CODING GUIDE:

01 Store this ...
02 Supermarket
03 Other store
04 Market
05 Informal this c.u.
06 Other informal
07 Other

Type & Ref. No.	ITEM	PRICE - *how much did you pay?*	QUANTITY - WEIGHT *(if price not known)*	QUANTITY - UNIT NO.	PLACE OF PURCHASE
6 7 8	9 10 11	12 13 14 15 16	17 18 19 20	21 22	23 24
H 0 1					
H 0 2					
H 0 3					
H 0 4					
H 0 5					
H 0 6					
H 0 7					
H 0 8					
H 0 9					

H. CASH
·EXPENDITURE

Has anybody in this household spent any money today on goods or services? (e.g. food, transport, newspapers, lunch at work) H'hold No. Day No.

1	2	3		4	5

CODING GUIDE:

01 Store this c.u.
02 Supermarket
03 Other store
04 Market
05 Informal this c.u.
06 Other informal
07 Other

Type & Ref. No.	ITEM	PRICE - *how much did you pay?*	QUANTITY - WEIGHT (if price not known)	QUANTITY - UNIT NO.	PLACE OF PURCHASE
6 7 8 / H 1 0	9 10 11 12	13 14 15 16 17	18 19 20 21	22 23	24 25
H 1 1					
H 1 2					
H 1 3					
H 1 4					
H 1 5					
H 1 6					
H 1 7					
H 1 8					

I. CASH
    TRANSFERS
    GIVEN

Did anyone in this household give anybody else any cash today?

1	2	3		4	5

H'hold No.   Day No.

	CODING GUIDE:	01 Man's Fa or Mo 02 Woman's Fa or Mo 03 So or SoWi 04 Da or DaHus 05 Bro or BroWi 06 Sis or SisHus 07 other kin 08 church official 09 Non-kin	01 This c.u. 02 This town 03 Other town 04 Village 05 RNV 06 Outside PNG	This town Other town Same vill. Same province Other province RNV Other country
Type & Ref. No.	AMOUNT GIVEN	RELATIONSHIP of recipient to head of this household	PLACE OF RESIDENCE of recipient	PLACE OF BIRTH of recipient
6 7 8 I 0 1	9 10 11 12 13	14 15	16 17	18 19
I 0 2				
I 0 3				
I 0 4				

J. TRANSFERS
    IN KIND
    GIVEN

Has anybody in this household given anyone else anything apart from cash today? (prompt: food, cooked food, transport).

H'hold No.   Day No.

Type & Ref. No.	ITEM	QUANTITY: WEIGHT	QUAN-TITY: UNIT NO	VALUE IF KNOWN	RELATIONSHIP of recipient to head of this household	PLACE OF RESIDENCE of recipient	PLACE OF BIRTH of recipient
6 7 8 J 0 1	9 10 11 12	13 14 15 16	17 18	19 20 21 22 23	24 25	26 27	28 29
J 0 2							
J 0 3							
J 0 4							
J 0 5							

<u>Interviewer Check Sheet</u>

<u>Menu Sheet: meals eaten today</u>

	Item	Accounted for

1. <u>Morning</u>

2. <u>Lunch at home</u>

3. <u>Lunch out</u>

4. <u>Evening meal</u>

---

snacks?   PMV fares

school meals?   hospital

cigarettes?   Post Office

wild fruits and nuts?   newspaper

plans for tomorrow, subsistence

RECALL SURVEY FORM

HOUSEHOLD NO. _____   NAME OF HOUSEHOLD HEAD _____

<div align="center">

CASH EXPENDITURE OVER LAST 12 MONTHS ON
ITEMS NOT PURCHASED REGULARLY

</div>

In the last year have you spent any money on any of these things?

What did you buy?	*How much did it cost?*
CLOTHING AND FOOTWEAR	
MENSWEAR	
shorts	
trousers	
shirts	
T shirts	
underpants	
WOMEN'S WEAR:	
dresses	
skirts	
blouses and tops	
underpants	
CHILDREN'S CLOTHING	
nappies	
trousers	
shorts	
shirts	
blouses	

2

What did you buy?	*How much did it cost?*
T shirts	
dresses	
skirts	
underpants	

MATERIALS FOR SEWING

material	
cotton	

FOOTWEAR

shoes	
sandals	
thongs	
shoe repairs	

RENTS, COUNCIL CHARGES, FUEL AND POWER

Land rent over year	
House rent over year	
Water sanitation and garbage charges over year	
Electricity charges over year	
Other	

3

What did you buy?	How much did it cost?
HOUSEHOLD EQUIPMENT AND OPERATION	
FURNITURE, FIXTURES AND REPAIRS TO SAME:	
chairs	
tables	
HOUSEHOLD TEXTILES ETC	
mattress	
pillow	
sleeping mat	
mosquito net	
sheets	
towels	
APPLIANCES	
stove	
refrigerator	
washing machine	
sewing machine	
GLASSWARE, TABLEWARE AND UTENSILS	
glasses	
cups or mugs	
plates	
knives, forks, spoons	
saucepan	
kettle	

4

What did you buy?	How much did it cost?
frying pan	
bucket	
bowls	
kerosine lamp	
pressure lamp	

TOOLS

What did you buy?	How much did it cost?
bush knife	
rake	
axe	
garden hose	
hammer	
chisel	
broom or brush	

BUILDING MATERIALS

What did you buy?	How much did it cost?
nails	
wood	
roofing iron	

HOUSEHOLD OPERATION SERVICES

What did you buy?	How much did it cost?
insurance of house	
cleaning	
domestic helpers (for year)	

5

What did you buy?	How much did it cost?
TRANSPORT AND COMMUNICATION	
fares for leave (if purchased by self)	
other long-distance travel	
canoe purchase	
motor vehicle purchase	
motor bike	
outboard motor	
motor vehicle or other repairs	
motor vehicle or other insurance	
driving licence	
car licence	
parts for vehicle or motor	
long-distance telephone calls paid by self	
other communication	
MISCELLANEOUS	
medicines	
disprin etc	
bandaids or plasters	
eye glasses	
medical fees	
clinic	
hospital	

6

What did you buy?	How much did it cost?
Education	
primary school fees	
high school fees	
text books	
school supplies	
Entertainment and cultural	
radio	
cassette player	
cassette tapes	
camera	
guitar	
toys	
books	
football	
Personal care and effects	
watch	
necklace	
toothbrushes	
handbag	
suitcase	
writing paper	
pens	
Financial services	
insurance service charges	
bank charges	

7

What did you buy?	How much did it cost?
Other services	
building a coffin	
other funeral charges	
duplicating	
advertising	
lawyers	
Local government tax	
Annual church contribution (United Church)	
Is there anything else that you have missed out that you have bought over the last 12 months?	

8

OTHER MONEY SPEND IN THE LAST TWELVE MONTHS ON SPECIAL OCCASIONS

In the last year (twelve months) have you spent any money on brideprice, perhaps giving money to help someone else with their payment?

	Name of person you helped or your own brideprice	Month when you gave the money	How much did you give?
1.			
2.			
3.			
4.			
5.			
6.			
	TOTAL (Office use only)	02 01	

In the last year (twelve months) have you spent any money on funeral feasts or other feasts for a dead person?

	Who was the feast for?	Month when you spent the money	How much did you spend?
1.			
2.			
3.			
4.			
5.			
6.			
	TOTAL (Office use only)	03 01	

9

In the last year (twelve months) have you spent any money on compensation payments to other people, perhaps for a court case or a fight?

	Who did you give it to?	Month when you made the payment	How much did you spend?
1.			
2.			
3.			
4.			
	TOTAL (Office use only)	04 01	

In the last year (twelve months) have you spent any other money on large feasts or special occasions?

	Give details of feast or other occasion	Month when you spent the money	How much did you spend?
1.			
2.			
3.			
4.			
	TOTAL (Office use only)	05 01	

MONEY OR OTHER THINGS YOU HAVE RECEIVED FROM OTHER PEOPLE
ON SPECIAL OCCASIONS IN THE LAST TWELVE MONTHS

In the last year (twelve months) have you received any cash from a brideprice payment?

	Who gave it to you?	Month when you received the money	How much did you receive?
1.			
2.			
3.			
4.			
5.			
6.			
	TOTAL (Office use only)	06 01	

10

In the last year (twelve months) have you received any cash from a funeral feast or other feast for a dead person?

	Who was the feast for?	Month when the feast was held	How much money did you receive?
1.			
2.			
3.			
4.			
5.			
6.			
TOTAL (Office use only)		07|01	

In the last year (twelve months) have you received any money from compensation payments from other people, perhaps after a court case or a fight?

	Who did you receive the money from?	Month when you were given the money	How much did you receive?
1.			
2.			
3.			
4.			
TOTAL (Office use only)		08|01	

In the last twelve months have you received any other money at large feasts or special occasions?

	Give details of feast or other occasion	Month when you received the money	How much did you receive?
1.			
2.			
3.			
4.			
TOTAL (Office use only)		09|01	

11

NOW HERE ARE SOME QUESTIONS ABOUT OTHER LARGE GIFTS YOU HAVE GIVEN AND RECEIVED.
THESE QUESTIONS ARE ONLY ABOUT THE LAST TWO MONTHS (not twelve months).

Note: a large gift is worth K20 or more

In the last two months have you given anybody living in a rural village K20
or more in money or something like a radio or food worth more than K20?

	Who did you give it to?	In what month?	What did you give them?	How much money or how much did it cost?
1.				
2.				
3.				
4.				
5.				
6.				

TOTALS (for   (Total cash   10 01

Office use only) (Total kind   10 02

In the last two months have you given anybody living in this town K20 or more
in money or something like a radio or food worth more than K20?

	Who did you give it to?	In what month?	What did you give them?	How much money or how much did it cost?
1.				
2.				
3.				
4.				
5.				
6.				

TOTALS (for   (Total cash   11 01

Office use only) (Total kind   11 02

12

In the last two months have you given anybody <u>living in another town of station</u>
K20 or more in money or something like a radio or food worth more than K20?

	Who did you give it to?	In what month?	What did you give them?	How much money or how much did it cost?
1.				
2.				
3.				
4.				
5.				
6.				

TOTALS (for   (Total cash   12|01

Office use only) (Total kind   12|02

In the last two months has anybody <u>living in a rural village</u> given you K20
or more in money or something like a radio or food worth more than K20?

	Who gave it you?	In what month?	What did they give you?	How much money or how much did it cost?
1.				
2.				
3.				
4.				
5.				
6.				

TOTALS (for   (Total cash   13|01

Office use only) (Total kind   13|02

13

In the last two months has anybody <u>living in this town</u> given you K20 or more in money or something like a radio or food worth more than K20?

	Who gave it you?	In what month?	What did they give you?	How much money or how much did it cost?
1.				
2.				
3.				
4.				
5.				
6.				

TOTALS (for (Total cash   14 | 01

Office use only) (Total kind   14 | 02

In the last two months has anybody <u>living in another town</u> or station given you K20 or more in money or something like a radio or food worth more than K20?

	Who gave it you?	In what month?	What did they give you?	How much money or how much did it cost?
1.				
2.				
3.				
4.				
5.				
6.				

TOTALS (for (Total cash   15 | 01

Office use only) (Total kind   15 | 02

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