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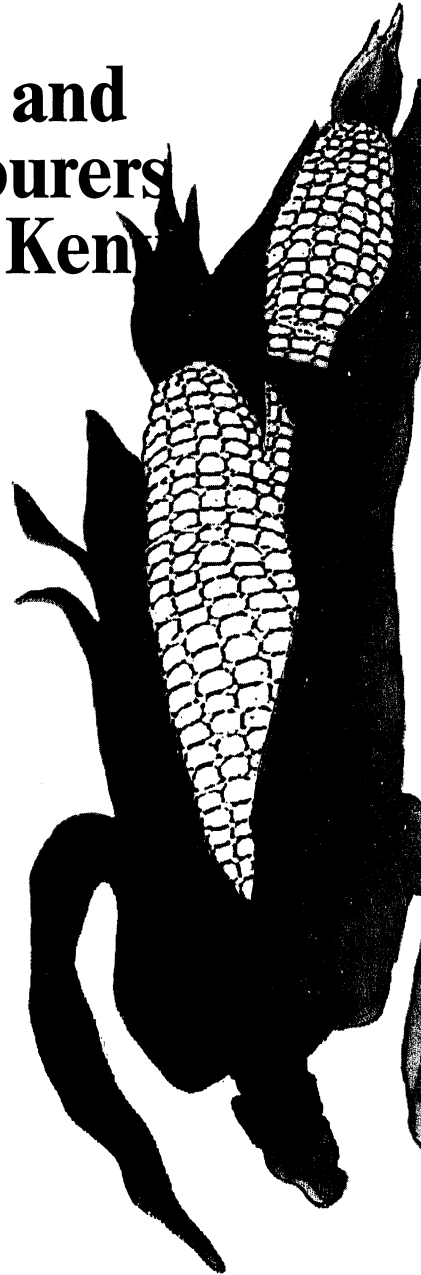
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Food and Nutrition Studies Programme

**Household Resources and
Nutrition of Farm Labourers
in Trans Nzoia District, Kenya**

Dick Foeken & Nina Tellegen

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Household resources and nutrition
of farm labourers in
Trans Nzoia District, Kenya

Dick Foeken & Nina Tellegen

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This report is the second in a series of three regarding food supply and nutrition among farm labourers in Trans Nzoia District. The first report deals with the labour conditions of labourers on large farms in the district. The present report offers information on socio-economic characteristics, food consumption and anthropometry of the labourers' households. The third report discusses in more detail two aspects that are considered to be of importance for the household's food security, i.e. rural employment and social networks.

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Summary

This report, the second in a series of three regarding food supply and nutrition among labourers on large farms in Trans Nzoia District, deals with the living conditions, household resources, food consumption and nutritional situation in the labourers' households. The data were collected in June and July 1989 among some 300 households. Three types of labourers' households are distinguished, i.e. permanent labourers living on the large farms, casual labourers living on the farms ('resident casuuls'), and casual labourers living outside the farms ('non-resident casuuls'). For comparison a group of households was included in which nobody had performed any casual labour on a large farm during the year prior to the survey ('non-labourers').

Compared with the households *outside* the large farms (non-resident casuuls and non-labourers), the households *on* the large farms (permanent labourers and resident casuuls) are somewhat smaller but nevertheless more persons have to share one room. They less often have a latrine, but more often have improved drinking water at their disposal. These characteristics combined make it difficult to assess whether the living conditions of the households *on* the farms are better, or vice versa.

The households *on* the large farms have very little land at their disposal, i.e. on average 0.9 acres for the permanent labourers and 0.5 acres for the resident casuuls. In this respect, the situation of the non-resident casuuls and in particular the non-labourers is much better. Especially among the resident casuuls, the percentage of landless households is high (49%).

Households living *on* the large farms have to be available for casual work any time. It is generally forbidden to seek employment or other income-generating activities outside the farms. As a result, the annual income of these households is comparatively low and is almost entirely derived from the labour performed on 'their' large farm. The households *outside* the farms manage to realize some income from agriculture, in particular the non-labourers. The latter group is also the only group with a relatively high income from non-agricultural employment. Hence, it is by far the wealthiest group.

The daily diet of all four study groups is mainly vegetarian. Cereals (maize) contribute 70 to 75% to the households' energy intake. The average energy intake in the three groups of labourers' households is almost the same (2250-2300 kilocalories per consumer unit per day) and about 300 kcal lower than the level in the non-labourers' households and 700 kcal lower than the estimated energy requirements. On average, the

level of protein intake is better, but clearly higher in the households *outside* the farms. The households *on* the farms have to buy nearly all their food, which is due to the very small plots of land at their disposal. Many of these households, however, are able to buy relatively cheap maize from the large farms' stocks.

The nutritional condition of the children in the three groups of labourers' households is not very good. About ten per cent of these children appear to be wasted and twenty-three per cent stunted. As far as the mothers are concerned, their nutritional condition is relatively bad in the group of resident casuals.

The study reveals that of the four study groups, the resident casuals can be considered the most vulnerable. This group can be split into two sub-groups, namely 'squatters' and so-called 'regular casuals'. Both groups have very little land at their disposal and are characterized by a very low annual income, in particular the squatters. The latter households also show the lowest average energy intake per consumer unit (900 kcal below requirements). About 20-25% of the children between 6 and 60 months in the squatters' households are wasted or stunted. However, the highest percentage of stunted children is found among the regular casuals, namely 34%.

Besides the squatters and the regular casuals, a third vulnerable group can be distinguished, notably the landless households living outside the large farms. They depend for about 60% on rural casual labour for their livelihood and realize a very low annual income. The percentage of wasted children is high (22%) and of stunted children even higher (33%).

1. Introduction

1.1 NUTRITION AND HOUSEHOLD RESOURCES

Kenya is facing the problem of securing an adequate food supply for its rapidly increasing population (McCarthy & Mwangi 1979; Senga et al. 1981). There is a high pressure on arable land, and future increases in agricultural production will depend on the possibilities of increasing the yields per hectare of crop land, as well as bringing remaining, often marginal areas under cultivation (Mwangi 1981; Kliet 1985).

As regards food consumption, it has been estimated that among the poorer strata of the population, which include groups such as smallholder farmers and agricultural labourers, energy intake presently reaches only 80% of requirements (Shah & Froberg 1980; Greer & Thorbecke 1984).

Various agricultural development strategies have furthermore been suggested to improve this situation, including specific measures to stimulate food production, redistribution of land and provision of legal titles to land to landless families, apart from various other means to increase agricultural production in general (GOK 1981). In Trans Nzoia District, several policy measures have been implemented. During the 1970s, the agricultural policy objectives in the district were formulated as follows: (-) intensification of land use; (-) growth of the proportion of farmers who obtain a cash income from their farm land; (-) promotion of a more even development throughout the district; (-) increase of employment opportunities in the rural areas; (-) improvement of nutritional standards; and (-) increase of the effectiveness of the agricultural extension services (ROK 1976). In practice this meant that, on the one hand, agricultural production realised on the (formerly European owned) large farms, had at least to be maintained, while on the other hand several of these large farms became subject to the settlement of landless people. It was to this latter category of people that policies were particularly directed. The results were not universally satisfactory, however, as in many cases the fragmentation of land led to holdings which were uneconomical in size (MEPD 1980).

Two groups of people directly involved with cultivating food crops can be distinguished: the small farmers on settlement schemes or otherwise sub-divided farms on the one hand, and the labourers on large farms on the other. In both groups, problems concerning food supply and nutrition were identified at the end of the 1970s and, again, in the 1980s (MEPD 1980; MFP 1984; MPND 1989). Compared with Kenya as a whole, the prevalence of malnutrition is high in the district (MPND 1989). According to the District Development Plan 1989-1993, this is caused by the fact "that a large proportion of the population consists of squatters and landless people who suffer from food deficiency". In 1989, there were some 12,000 landless people. Especially the squatters are considered to be the poorest group in the district, "suffering from malnutrition, poor sanitation and associated diseases".

Rural households, if they can, tend to rely on a range of resources in order to make a living. The household's own food production is the primary source of food supply, and thus of food consumption. However, it is increasingly recognized — by both researchers and policy makers — that other resources are becoming more and more important, due to such factors as the high population growth (leading to increasing fragmentation of land) and a growing need for cash (taxes, school fees, housing, consumer goods, transport, etc.).

Still, land is considered as the basic household resource, as for many rural households other resources — such as wage employment — are difficult to obtain. The Kenya Government has identified the rural landless as one of the nutritionally vulnerable groups. Especially in areas with high population densities, access to land is uncertain for many people. These groups are therefore greatly dependent on rural employment opportunities. Insight in the coping mechanisms and the nutritional needs of these disadvantaged groups is needed.

In 1983, the *District Focus for Rural Development* was introduced. The responsibility for planning and implementing rural development was shifted from the headquarters of ministries to the districts, with the objective "to broaden the base of rural development and encourage local initiative in order to improve problem identification, resource mobilization, and project design and implementation" (GOK 1987). These responsibilities are placed in the hands of the District Development Committees and include such tasks as "the identification and analysis of local development needs and the establishment of district development priorities". Knowledge of the food supply and nutritional status of a large part of the district population (i.e., the farm labourers) is indispensable in order to fulfil such tasks. The present study, therefore, serves to provide the district administration with these basic population data.

1.2 TRANS NZOIA DISTRICT

Rift Valley Province comprises 13 districts, Trans Nzoia being the smallest one, covering 2,468 square kilometers (MPND 1989). With 394,000 inhabitants in 1989 it accounted for about 2% of the Kenyan population (CBS 1991). Compared with 1979, this is an average annual growth of 4.2%. The population density is fairly high, being 212 persons/km² in 1988 (MPND 1989). Besides natural increase, the rapid population growth is also due to the influx of landless and/or jobless people from other districts trying to find work on the large farms in the area.

Trans Nzoia District forms the continuation of the fertile Uasin Gishu Plateau beyond ("trans") the Nzoia River. Its topography is generally flat with gentle undulations, rising steadily to Mount Elgon in the north-west (4,313m above sea-level) and the Cherangani Hills in the east (highest peak of 3,371m). Most of the district has an elevation between 1,800 and 1,900m. Only in the north, along the border with West Pokot District, does the altitude drop fairly rapidly to 1,400m above sea-level (Jaetzold & Schmidt 1983; MPND 1989; Agatsiva 1985).

Trans Nzoia has a highland equatorial type of climate. Average annual rainfall ranges from 1,000 to 1,200 mm and is fairly evenly spread throughout the year, with slight peaks during April-May and July-August. There is one dry period, starting mid-November and ending mid-March. Average annual temperature in Kitale is 18.3°C, with a mean maximum of 25.0°C and a mean minimum of 11.7°C. August is the coldest month, with an average temperature of 17.1°C (mean maximum 23.0°C, mean minimum 11.2°C) and March the warmest (average 19.6°C, mean maximum 27.0°C, mean minimum 12.2°C) (Jaetzold & Schmidt 1983; Agatsiva 1985).

The central part of the district consists of well-drained, very deep, red to dark red soils (mainly ferralsols). These soils have a moderate to low fertility. The slopes of Mt. Elgon are covered with red and brown clays, derived from volcanic ash, which have a high fertility. The hills and steep slopes of Mt. Elgon, Cherangani and the north boundary zone towards West Pokot have rather shallow stony soils, with a variable fertility. In many cases, only half of these areas is suitable for agriculture (Jaetzold & Schmidt 1983; MPND 1989; Agatsiva 1985).

Topography, rainfall distribution, temperature and soil characteristics make the district very suitable for maize growing and dairy farming. Most of the arable area of Trans Nzoia falls within agro-ecological zone UM 4 (Upper Midlands sunflower-maize zone). In the higher areas, with mean annual rainfall up to 1,400 mm, LH-zones (Lower Highland) predominate, either LH 2 (wheat/maize-pyrethrum zone) or LH 3

(wheat/maize-barley zone). Coffee and tea can also be cultivated in these higher areas (Jaetzold & Schmidt 1983). All arable land in Trans Nzoia, together 81% of the total land area (MFP 1984), is of high potential (CBS 1986).

In terms of land use, livestock rearing is the most important activity in Trans Nzoia. According to the KREMU land-use survey in Trans Nzoia, which was carried out in 1984, almost half of the arable land surface in the district was used for livestock grazing (Agatsiva 1985). In 1988/89, some 150,000 heads of cattle were counted in the district, two-thirds of which being of high grade (Friesians, Ayrshires, Guernseys, Sahiwals and their cross-breeds). Most of the milk produce went through KCC¹ Ltd. in Kitale, totalling almost 41 million kg in 1988/89 (MOLD 1991). This equals about 12% of the total KCC milk production in Kenya (CBS 1991).

In 1988/89, about 68,000 ha (or 34% of the arable land surface) was planted with commercial maize. Maize production reached a record level of 3.4 million 90 kg bags in these years (MOA 1990). If we compare such figures with a national figure of 5.4 million bags of maize bought by the NCPB in 1988 and 7.0 million in 1989 (CBS 1991), it is evident that Trans Nzoia is the maize granary of Kenya.

Besides maize, other important crops cultivated in Trans Nzoia are, in sequence of hectareage in 1989, beans, seed maize, commercial wheat, sunflowers, coffee, seed wheat, and tea (MOA 1990).

The bulk of the surplus production of both maize and milk comes from the large farms that are characteristic for Trans Nzoia. During colonial times, the whole district consisted of white-owned large farms. Since Independence all farms have been sold to Africans and many of them have been sub-divided, either by the government (settlement schemes) or, in the case of group-owned farms, among the participants. Nowadays, land ownership in Trans Nzoia shows a rather dualistic structure, with large to very large farms on the one hand (in 1989 there were approximately 220 farms of 100 acres or more; see Foeken & Verstrate 1992) and many smallholders or even landless on the other.

Among the 46 large farms of 100 acres and more comprising the 1989 farm survey², 24% of the land was used for maize cultivation (10% commercial maize, 14% seed maize) and 59% for grazing (44% rough grazing, 15% improved grazing). Moreover, the larger the farms, the higher the percentage of land used for seed maize and improved grazing. Wheat, coffee, sunflowers and oranges appeared to be minor crops. Maize yields appeared to vary with farm size, ranging from less than 14 bags per acre on the smaller farms (100-200 acres) to over 20 bags on the larger ones (over 500 acres). In

¹ Kenya Cooperative Creameries

² See Foeken & Verstrate 1992.

other words, maize yields on the larger farms were about 50% higher than on the smaller farms. Regarding livestock (measured as the number of grazing acres per head of cattle), no such differences were found (Foeken & Verstrate 1992).

1.3 FARM LABOUR

According to the law, there is a clear distinction between permanent (or regular) labourers and casual labourers. Permanent labourers earn a monthly salary (KSh.354/- in 1987), casuals are paid after each day's work (KSh.14/95), but in practice this is often piece-work. What follows below is a summary of the findings regarding these two types of labour categories from the 1989 farm survey, which covered 46 farms.³

Permanent labourers

On average, the farms — with an average size of 711 acres — employed 17 permanent labourers per farm. Two farms did not employ any permanent labourers, while the largest number was 110. The largest single group of permanent labourers were dairy workers, closely followed by the category of farm workers (fencing, plumbing, bricklaying, etc.). Most farms also employed some drivers as well as watchmen. Overseers, office workers and mechanics were categories mainly found on the larger farms.

Salaries varied, not only between the different categories of permanent labourers, but also between farms. For instance, the wages of dairy workers and farm workers ranged from KSh.200/- to KSh.600/- per month. The average wage in 1989 for these two categories was KSh.343/-. If we compare this with the 1988/9 legal minimum of KSh.354/-, one can only conclude that on several farms wages were very low indeed.

On nearly all farms, the permanent labourers were provided with a house (89%), water supply (93%), a latrine (91%) and basic medical services (95%). The latter usually implied first aid, some basic drugs and transport to a hospital if necessary. On 42 of the 44 farms with permanent labourers, the owner reserved a part of the land for the labourer's use. On average, the labourers had 1.0 acre at their disposal. The labourers were not totally free regarding the use of their plot. On eight of the twenty-one large farms with seed maize the labourers were not always allowed to cultivate maize, notably when their plots were too close to the fields with seed maize. It was generally forbidden to keep livestock.

³ See Foeken & Verstrate 1992, Chapter 4 (Permanent labourers) and Chapter 5 (Casual labourers).

On 70% of the farms, the labourers had the opportunity to buy maize from the farm's stock. The average price they had to pay was KSh.35/- per *debe*, which was substantially lower than the normal market price at the time of the survey (KSh.45/-). One-third of the farms also offered the possibility to buy milk at a relatively low price, i.e. on average three shillings instead of five.

On most farms, the permanent labourers received gifts in the form of food. At 35 farms (78%), the permanent labourers were given some meat, mostly once a year, i.e. with Christmas. The amount given varied considerably, ranging from 1 to 5 kg per labourer. Other food items were given on relatively few farms. On five farms, some maize was given, either once a year or irregularly. On eight farms, milk was given, varying from one-and-a-half litres per day to a few litres per year. Finally, sugar was given on seven farms, mostly 1 kg per year.

Casual labourers

The demand for casual labour is to a large extent connected with the maize cycle. The 1988 maize cycle showed one labour peak during the June-August period (weeding and top-dressing and detussling of seed maize) and another one around November (cutting and stocking). It was rather surprising to find that during the leanest months (February and March), some 50 casual labourers per farm were still employed.⁴ It turned out that many casuals worked quite regularly for 'their' employer. The casuals on the surveyed farms worked on average 97 days on those farms. More than one-fifth of them worked for at least 181 days on the same large farm, and one-tenth even more than 270 days.

Not less surprising was the finding that almost three-quarters of the casuals (on the 20 farms with a complete labourers' administration) were living on the farm they worked on. This percentage was higher according to the number of days employed per year. Some were family members of the permanent labourers. The others formed a rather diffuse group and can roughly be split in two. One sub-group was recruited by the owners/managers as 'regular casuals'. They lived on the farm, usually in the same labour camp as the permanent labourers. The second sub-group of casuals on the farm could be considered 'squatters', i.e. people occupying a piece of land on the farm without having a legal title to that land.⁵ They usually lived on the fringes of the large farm. In this report the regular casuals and squatters are treated as one group of resident casuals, with one

⁴ This figure is based on 20 farms with a complete administration of the casual labourers. The average size of these farms was 1025 acres.

⁵ Mbithi & Barnes (1975) define squatters as "potential farmers and unemployed persons [who] occupy land for which they have no legal title for the purposes of establishing residence and/or cultivation".

exception where a sub-analysis is reported (Section 7.3). The remaining quarter of the casuals came from outside the farms and were only employed at certain times of the year.

The wages of the casual labourers showed substantial differences per farm. The average daily wage for either weeding or detussling appeared to be KSh.13/-. This was well below the legal daily wage as set in 1987, which amounted to KSh.14/95. The lowest daily wage found was only KSh.8/-, the highest amounted to KSh.20/-. All the others were in the range of KSh.10/- to KSh.15/-. Weeding wages per acre also varied considerably. On average, KSh.87/- per acre could be earned, ranging from KSh.60/- to KSh.120/-. Harvesting was paid per bag of cobs. The normal wage in 1989 was KSh.3/- per bag and that was also the average wage on the 46 farms. However, the lowest wage found was KSh.2/- per bag (four farms), the highest was KSh.5/- (one farm). To some extent, these discrepancies could be explained in terms of demand and supply of labour.

As with the permanent labourers, the casuals were provided with some basic medical provisions. In practice, this usually meant first aid and, if needed, transport to hospital. On several farms, the casual labourers were able to buy maize and milk from the farm stores. On nearly half the farms, maize could be bought at an average price of KSh.36/- per debe. This was the same price as paid by the permanent labourers. Milk was sold on only 17% of the farms. The average price the casuals had to pay was KSh.3/10, which was substantially lower than the market price.

On one-third of the farms, the casual labourers received some gift of food each year. As with the permanent labourers, this mainly took the form of one to five kilograms of meat at Christmas. Maize, milk and sugar were given on only a few farms.

1.4 OUTLINE OF THE REPORT

In order to provide information on the above-mentioned topics as well as the nutritional situation of the labourers' households, two surveys were carried out in 1989: a large-farm survey and a household survey.⁶ The aim of the large-farm survey was to gather general information on farming activities, numbers and payments of labourers, origin of the labour force, and provisions for labourers. The results of this survey are presented in Foeken & Verstrate 1992.

⁶ These two surveys together comprise the 'main study'. Earlier FNSP-reports on this study concerned the Research Outline (FNSP 1988) and a Progress Report (FNSP 1990). Besides the main study, a support study was carried out, in which the importance of non-agricultural employment and social networks for the income of households of labourers on large farms was assessed (see Tellegen, Verstrate & Foeken 1992).

The present report concerns the household survey and provides information on household composition, economic activities, farming practices, food consumption, and nutritional condition. Chapter 2 deals with the methodological aspects of the study — such as study design, data schedule and sampling procedures — as well as with some basic demographic characteristics of the study population. Chapter 3 deals with some important living conditions of the study population: housing conditions, firewood and drinking water. Chapter 4 discusses the sources of income, consisting of the households' farming activities, agricultural wage labour (on large farms) and non-agricultural wage labour. Special attention is also given to the division of labour between men and women. Food consumption is the subject of Chapter 5, while Chapter 6 offers the main findings regarding the nutritional condition of the children and their mothers. Finally, in Chapter 7 an attempt is made to explain the differences regarding the nutritional status between the several study groups and a sub-analysis focusing on vulnerable groups is presented.

On November 23rd and 24th, 1992, the results of the present report as well as the accompanying reports (Foeken & Verstrate 1992; Tellegen, Verstrate & Foeken 1992), were discussed during a dissemination seminar in Kitale. The lengthy discussions led to a number of policy recommendations. These are included in a separate report (Tellegen & Foeken 1992).

2. Method

2.1 OBJECTIVES, DESIGN AND DATA SCHEDULE

The present study is part of the Food and Nutrition Studies Programme. A major aim of the programme is to identify food and nutrition problems in rural areas, in order to provide the Kenyan government with the information necessary to formulate and implement policies in this field.

The general objective of this study is to provide knowledge of the food supply and nutritional conditions of the households of labourers on large farms. Consequently, three groups of labourers are compared:

- permanent labourers (living on the large farms);
- resident casuals (living on the large farms); and
- non-resident casuals (living outside the large farms).

For comparison purposes, a fourth group was added, namely

- non-labourers, mainly consisting of smallholder farmers.

The distinction between the three categories of labourers, and especially the resident casuals, needs some clarification. Permanent labourers differ from the two categories of casual labourers in that they earn a regular salary by doing farm labour, they live on the farm where they work, and they usually enjoy several kinds of provisions. The latter include such things as a house, water supply, a piece of land for own use, cheap maize and milk from the farm, basic medical facilities, and gifts of food.

The resident casuals have the following characteristics: (-) they perform casual labour on the farm where they live on a more or less regular basis; (-) they are obliged to work for the farm owner if needed, on pain of being removed; (-) they enjoy such privileges as the possibilities of buying cheap maize and milk from the farm stock and receiving presents of food; (-) they face restrictions regarding the use of their small plot (no livestock, no maize in case seed maize is cultivated nearby); (-) they are not allowed to work outside the farm. The main difference with the permanent labourers, then, lies in the remuneration of their work, being lower and irregular.

Non-resident casuals are generally smallholders living on a sub-divided farm in the vicinity of the large farm(s) where they work. The main differences with the resident casuals are: (-) their labour is more season-bound, so their income from casual labour is lower; (-) they have less possibilities of sharing in such provisions as buying cheap maize and milk on the farm where they work; (-) on the other hand, they obviously do not face the restrictions regarding land use and seeking labour opportunities elsewhere.

Regarding the labourers' households, the following information was collected (see Appendix 36 for the complete questionnaire):

Housing circumstances and living conditions

- house, kitchen, water use, fuel use

Demographic characteristics of household members

- sex, age, marital status, education, residency

Economic activities of household members

- type of activity, duration, income

Farming characteristics

- acreage, plots; harvest and sales of crops; expenditures on food crops
- livestock; constraints of food production; sales of horticultural crops

Nutritional status

- height, weight and health of mothers
- height, weight, mid-upper arm circumference, and health of children 0-11 years

Food consumption

- food preparation: observation, recall
- dishes and ingredients: types and amounts
- household food intake; dietary recall of children 0-11 years

2.2 SAMPLING PROCEDURES

The initial farm survey covered all farms with a size of 100 acres or more. From a total estimated number of 220 farms, a 20% sample was drawn, stratified according to farm size. In that way, 46 farms were selected. For purposes of the household survey, these farms were grouped into six geographical clusters. From each cluster, 1-4 farms were selected; only those farms could be selected that were known to employ enough labourers of one or more types. Map 1 shows the 46 farms as well as the farms that were used for tracing the households.⁷ The sample was as follows:

- 50 households of permanent labourers living on large farms: "permanents",
- 50 households of casual labourers living on large farms: "resident casuals",
- 150 households of casual labourers living outside large farms: "non-resident casuals",
- 50 households of persons who did not work as casual labourers: "non-labourers".

⁷ During the farm survey not only the numbers of the different types of labourers were asked for, but also the recruitment areas of the non-resident casuals.

As far as the three categories of labourers are concerned, the selected numbers of households to a certain extent reflect the numbers that could be estimated from the data of the farm survey (being 1: 0,5 : 3,5).⁸ Only the group of resident casuals is somewhat over-represented, but proportional representation would make the number of households in this category too small. The relatively large number of households of non-resident casuals also allows for sub-analysis (which is done in Section 7.3). The actual number of non-labourers' households in the district is not known, but this group solely functions as a comparison group.

Non-resident casuals could be found on nearby sub-divided farms and were traced by asking whether any (resident) household member had done casual labour on any large farm during the year prior to the interview. If this was not the case, the household was designated as 'non-labourer'.

In order to collect a maximum of information on nutritional conditions, the survey covered households with young children between the ages of six months and five years. Households without young children in this range were excluded but they proved very few.

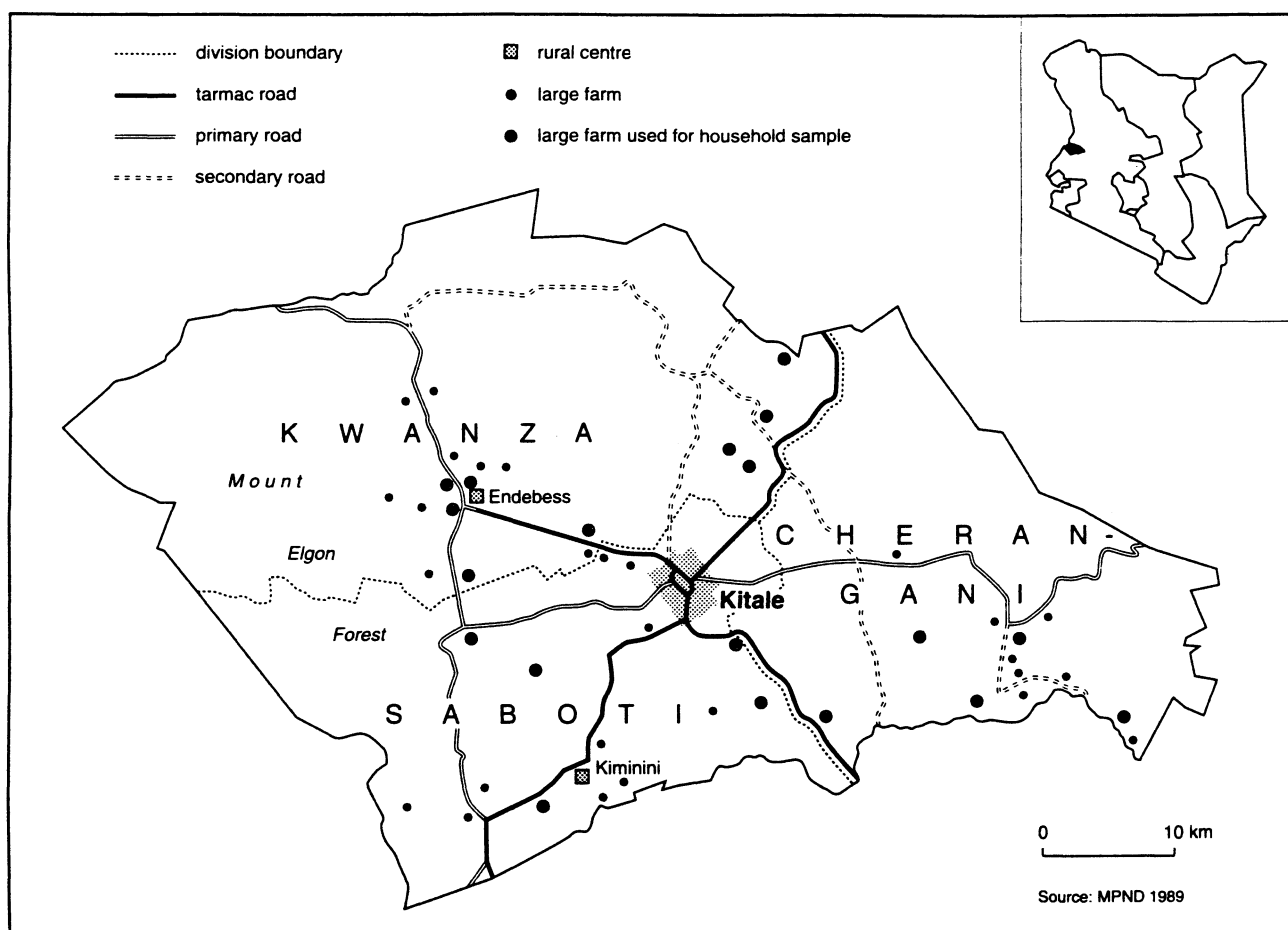
Thus, the household survey included 300 households. To be sure, however, that enough households were included in each of the above categories, several extra households were interviewed. Moreover, after analysis, some households in the group of 'non-labourers' actually appeared to belong to the group of 'non-resident casuals', despite careful asking whether any household member had done casual labour.⁹ The final study population is shown in Table 2.1.

Table 2.1
Households: study population, by study group

	permanent labourers	resident casuals	non-resident casuals	non- labourers	total
• number of households	47	51	165	35	298

⁸ For the 220 farms of 100 acres or more, the estimated figures (during *peak* labour periods) at district level are 3,900 households of permanent labourers, 2,000 households of resident casuals and 13,500 households of non-resident casuals. See Foeken & Verstrate 1992, p. 22 (permanent labourers) and p. 31 (casual labourers).

⁹ This was possible because each household was visited twice, i.e. first during the selection procedure (asking, among others, whether anybody had performed casual labour) and later on for the actual interview.



Map 1

Trans Nzoia District: farm sample and household sample

Of all households, 80% were approached on one occasion with the 'basic questionnaire', containing information regarding household composition, economic activities of household members, farming, anthropometry, health, food preparation of the preceding day, and food consumption (i.e., the whole household questionnaire excluding Form 6; see Appendix 36). The remaining 20% of the households were visited for three whole days, every other day. On each occasion, all food preparation and consumption was observed. Moreover, a food preparation recall of the day before was done. In this way, a period of six days was covered for these "observation households".

The households of the permanent labourers and the resident casuals were easy to trace and were selected in the field by cluster sampling method, starting from a random point within the main area of residence of the eligible households in the particular category. The only limitation regarding the resident casuals was that on only three farms of the farm survey a sufficient number of these households were present. For tracing the households of the non-resident casuals, data regarding the main recruitment areas of the large farms in order to find 'their' casual labourers could be used. Almost without exception, these households were living on an adjacent sub-divided farm. Again, cluster-sampling was used to select these households. Finally, the non-labourers' households were selected as the nearest neighbours of non-resident casuals.

The actual interviewing was done in four periods of eight days (six days work, two days off) from the end of June until the end of July 1989. Anthropometric measurements of the children and their mothers was done during the weekends and was organized with the help of village elders.

2.3 STUDY POPULATION

Trans Nzoia is a district with a high percentage of immigrants from other districts. In the present study, two-thirds of the heads of households were not born in Trans Nzoia (see Appendix 1). The four study groups showed no difference on this point. On average, the heads of the households had come to Trans Nzoia 16 years earlier. The duration of stay of the heads living *outside* the large farms (non-resident casuals and non-labourers) was four years longer than that of the heads living *on* the large farms (permanent labourers and resident casuals) (Appendix 1).

Because of the high inflow of people, the population of the district is very heterogeneous regarding ethnic background. In Table 2.2, the ethnic composition of the

Table 2.2

Study population: ethnic composition (%)

	present survey* (N=49)	Schafgans 1988 (N=199)	CBS 1981 (N=259,673)
• Luhya	75.5	53.2	49.3
• Turkana	8.2	3.2	4.9
• Teso	6.1	4.8	3.8
• Kalenjin	4.1	16.1	22.6
• Kikuyu	-	9.7	10.3
• other	9.1	13.0	9.1
total	100	100	100

* Source: Tellegen, Verstrate & Foeken 1992. It concerns heads of labourers' households only.

study population¹⁰ is compared with that from two other sources, i.e. the Census of 1979 and a survey held in 1986/87 (Schafgans 1988). It shows that there are many Luhya and Turkana among the labourers on large farms in the district, while Kalenjin and Kikuyu are under-represented.

Appendices 2 to 5 contain several demographic characteristics of the study population. It included 2556 persons, 91% of whom were full-time residents, 3% were usually living elsewhere, and the remaining 6% could be considered part-time residents. Of the full-time residents (2331 persons), 37% were adults and 63% children (i.e., younger than 17 years of age). Table 2.3 shows the age composition of the full-time residents in each of the four study groups. Compared with the Census of 1979 and the population projection of 1988 (MPND 1989), the age composition of the study population does not show important deviations, be it that the percentage of children was somewhat higher. This is due to the way of sampling: as stated, only households with at least one child between 6 months and 5 years of age were selected.

In all study groups, the percentage of adult women was somewhat higher than the percentage of adult men. This is partly due to the fact that some of the male heads of households were married polygamously (Appendix 3). Among the non-labourers, the percentage of polygamously married heads was somewhat higher (24%) than among the heads in the labourers' households (17%).

Table 2.4 shows the percentage of female-headed households. They were almost exclusively found among the non-resident casuals. In this group, one out of every seven households was headed by a woman. Female-headed households were rarely found on

¹⁰ The figures concerning the FNSP-survey are derived from the in-depth study on rural employment and social networks (Tellegen, Verstrate & Foeken 1992). The study population of that study was a random sample from all households and can be considered as representative for the present study.

*Table 2.3***Study population: age composition, by study group**
(%)

(N=)	permanent labourers (335)	resident casuals (362)	non-resident casuals (1337)	non- labourers (297)
• children 0-10 yrs	47.6	46.8	47.0	44.8
• children 11-16 yrs	13.8	15.5	17.1	16.5
• adults 17-59 yrs	37.4	36.9	33.4	36.0
• adults 60+ yrs	1.2	1.1	2.5	2.4
• unknown	0.3	-	0.1	0.3
total	100	100	100	100

Source: Appendix 3

*Table 2.4***Heads of households: sex, by study group**
(%)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (34)
• male	95.7	96.1	84.8	100
• female	4.3	3.9	15.2	-
total	100	100	100	100

Source: Appendix 3

*Table 2.5***Adults*: educational level, by sex and study group**
(years of formal education)

	permanent labourers	resident casuals	non-resident casuals	non- labourers
• males	4.9	4.8	5.7	7.4
• females	2.4	2.4	3.7	5.6

* Persons of 17 years and older. For N's, see Appendix 4.

Source: Appendix 4

the large farms, as it is almost exclusively men who are employed by the farm owners as permanent labourers or 'regular casuals'.

Table 2.5 offers some information regarding the educational level of the adult men and women. Important differences emerge, both between the sexes and between the study groups. In all study groups, the men had on average more years of formal

education than the women. Furthermore, the educational level of both sexes in the two groups living on the farms was much lower than of those living outside the farms. The non-labourers in particular showed up as a better educated group.

Table 2.6 shows the average household size of the study population. There are differences between the study groups: the households *outside* the farms were larger than the households *on* the large farms.

Table 2.6
Household size, by study group

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• average nr. of persons	7.4	7.4	8.8	8.9
• average nr. of consumer units*	4.7	4.8	5.3	5.4

* See note on consumer units in Appendix 35.
Source: Appendix 5

To summarize, the labourers *on* the large farms were of a lower educational level, and had slightly smaller households than households located outside the farms. They comprised relatively somewhat fewer children and more adults.

3. Living conditions

In this chapter, three aspects of the households' quality of living will be discussed: housing conditions, the provision of firewood and the provision of drinking water. The basic data can be found in Appendices 6, 7 and 8.

3.1 HOUSING CONDITIONS

In Table 3.1 the type of houses in the four study groups are presented. By law, large farm owners must provide their permanent labourers with a house. The table shows that this is not always the case: one out of each eight permanents had built his own house. One labourer had bought a house from the farm owner. The remaining 85% all said they rented a house from the farm owner, but no one paid any rent. The same applies to half the resident casuals. These are the 'regular casuals' who are living in the same labour camp as the permanent labourers. The other half of the resident casuals had built their own houses. This is the group of 'squatters', living on the fringes of the

Table 3.1
Type of house, by study group
(%)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (163)	non- labourers (35)
• self built	12.8	49.0	90.8	94.3
• bought	2.1	2.0	0.6	-
• rented	85.1	49.0	8.0	5.7
total	100	100	100	100

Source: Appendix 6

farms.¹¹ Households living outside the large farms usually built their own houses. Those renting a house paid an average rent of KSh.89/- per month.

Figures for two important housing facilities, i.e. a latrine and a store, are presented in Table 3.2. It is rather surprising that almost half the permanent labourers did not have a latrine at their disposal, more than among the resident casuals.¹² Apparently, living in a labour camp does not automatically imply good sanitary facilities. Moreover, 40% of those who did have a latrine shared it with one or more other households (Appendix 6). The percentage of households with a latrine was much higher among those living *outside* the large farms. However, also among these households, about 30% shared a latrine with one or two neighbours.

Table 3.2
Housing facilities, by study group
(%)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• latrine present	57.4	64.7	84.3	97.2
• store present	36.2	37.3	44.2	57.1

Source: Appendix 6

Regarding the households living on the farms, just over one-third had a store. Undoubtedly, this partly reflects their modest agricultural production, due to small plot sizes and restrictions regarding the cultivation of maize and keeping of livestock.¹³ Nevertheless, the percentage of households of the non-resident casuals having a store was only slightly higher. The situation was better in the households of the non-labourers.

Living densities are shown in Table 3.3. As far as the number of houses per compound is concerned, the study groups showed hardly any difference. That can not be

¹¹ The figures in Table 3.1 concerning the resident casuals reflect the fact that the majority of these households had to be selected from only two, very large farms. One of these was an ADC farm with a lot of 'regular casuals' living in the same labour camp as the permanent labourers. This is the group who rented a house from the farm owner. The other farm was individually-owned, with many 'squatters' living on its fringes. These people built their houses themselves.

¹² It is the more surprising as 91% of the farm owners/managers mentioned providing their permanent labourers with a latrine. See Foeken & Verstrate 1992.

¹³ The almost 800 permanent labourers on the 46 large farms of the farm survey had on average a plot of 1.0 acre at their disposal. The resident casuals had about 0.7 acre. On several farms (especially the larger ones), households were not allowed to cultivate maize when seed maize was cultivated nearby. On all farms the households were forbidden to keep any livestock. See Foeken & Verstrate 1992.

Table 3.3
Living density, by study group

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• average number of houses	1.6	1.7	1.8	1.9
• average number of rooms	2.2	2.0	2.8	3.7
• number of occupants per house	5.1	4.9	5.9	5.7
• number of occupants per room	4.1	4.5	4.1	2.9

Source: Appendix 5, 6

said of the average number of rooms per compound: the houses of the households living outside the large farms had more rooms than those on the farms. This applied in particular to the housing of non-labourers. As a result, living densities — measured as the number of occupants per room — in this study group were more favourable than in the other groups.

3.2 FIREWOOD

The large majority of the rural households in Africa use wood as the main source of fuel. Due to the increasing population densities in the rural areas, however, firewood is becoming more and more scarce. Table 3.4 shows where the selected households in Trans Nzoia collected their firewood. The figures in this table (as well as those in the

Table 3.4
Location of firewood, by study group
(%)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (163)	non- labourers (33)
• on own farm	2.1	2.0	6.7	21.2
• on large farm of employer	87.2	80.4	8.0	-
• elsewhere	10.6	17.6	85.3	78.8
total	1100	100	100	100

Source: Appendix 7

next table) refer to the wet season only, because there appeared to be hardly any differences between wet and dry seasons.

Households living on the large farms found their firewood mainly on the large farm they were living on. Nevertheless, 11% of the permanent labourers and 18% of the resident casuals had to collect their wood outside the large farm. For the households living outside the large farms, 'elsewhere' — such as roadsides — was the main source. About one-fifth of the non-labourers found the necessary wood on their own farms, indicating farms of a fairly substantial size.

Table 3.5
Firewood collection, by study group*

	permanent labourers	resident casuals	non-resident casuals	non- labourers
• collecting time (hours per week)	5.5	4.7	4.5	4.0
• collected amount (bundles per week)	2.4	2.4	2.7	2.3
• expenses on firewood (sh/month)	28	18	49	54

* For N's, see Appendix 7
Source: Appendix 7

In each study group about 2.5 bundles of wood were collected each week (Table 3.5). Apparently, this was not enough to cover the firewood needs, because an additional amount of money was spent each month on the purchase of this type of fuel. The households living outside the farms spent much more on firewood than those living on the farms. Partly, this may reflect differences in household size (see Table 2.6) and, as far as the non-labourers are concerned, in household income level (see next chapter).

3.3 DRINKING WATER

Clean drinking water is another important determinant of a household's quality of life and a major factor related to the health situation of the population. Trans Nzoia is a humid area. The annual rainfall is about 1,000 to 1,200 mm. It means that for their water needs many households can rely on surface water, because rivers, ponds, wells and small reservoirs are seldom dry. The figures in Table 3.6 confirm this situation: for many households, one of these sources formed their water supply. There appeared to be no differences between wet and dry seasons in this respect. *Improved* water sources, such

as taps, were mainly found *on* the large farms, although certainly not on all farms, as only half of the permanent labourers benefitted from this provision. The situation of the resident casuals was comparable with that of the permanent labourers.¹⁴

Table 3.6
Source of drinking water, by study group

	(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• river/pond/well/reservoir		47.8	57.9	82.7	72.9
• improved water source		51.1	42.1	9.7	7.1
• other		1.1	-	7.6	20.0
total		100	100	100	100

Source: Appendix 8

In each study group, the majority of the households were living within a relatively short distance of their drinking water source, i.e. less than 10 minutes walking (see Appendix 8). Households located at more than half an hour walking from the nearest drinking water source were few in all study groups. In general, the permanent labourers and the non-labourers were in the most favourable position in this respect.

3.4 CONCLUSIONS

In this chapter, three important determinants of a household's quality of life have been discussed: housing conditions, the provision of firewood and the provision of drinking water. The main conclusion is that regarding these aspects of life it made a difference whether a family lived *on* or *outside* a large farm. Families living *on* a large farm — the permanent labourers and the 'regular casuals' — were usually provided with a house, could collect their firewood mainly on the land of the large farm owner, and had relatively good access to improved drinking water. Families *outside* the large farms, however, had to build their own houses, had to find their firewood mainly 'elsewhere' and depended on surface water for their water needs. In one respect, families *on* the farms were worse

¹⁴ Again (see footnote 11 on page 18) the figures regarding the resident casuals reflect the way of sampling. Those with an improved drinking water source are found on the ADC farm with the 'regular casuals' and the majority of those with the other type(s) on the large individually-owned farm with the many 'squatters'.

off than those outside the farms, namely regarding the presence of a latrine. Rather surprisingly, almost half the permanent labourers had no latrine at their disposal. In other words, in quite a number of labour camps this facility was not provided by the large farm owner. Finally, in terms of housing conditions, the non-labourers distinguished themselves positively from the other three groups.

4. Sources of income

In this chapter, three types of income-generating activities are distinguished: farming activities, agricultural employment and non-agricultural employment. Farming activities consist of the cultivation of crops and keeping of livestock on one's own farm. Agricultural employment concerns labour on a large farm, either as a permanent labourer or on a casual basis. Non-agricultural employment consists of other types of wage labour or self-employment. All these activities will be reviewed in the first two sections of the present chapter. The third section deals with the sexual division of labour, while in the final section the income situation of the households is discussed. The basic data can be found in Appendices 9 to 19.

4.1 FARMING ACTIVITIES

Table 4.1 shows the average size of the farm land that households had at their disposal. In general, labourers had smaller plots than non-labourers, while labourers living *on* the large farms had smaller plots than labourers not living on the farms. It is especially in the group of resident casuals that land was very scarce indeed. Half the households in this category were completely landless. These are the 'regular casuals' living in labour camps. The other half — the squatters — had on average about one acre for food production. At the other extreme we find the non-labourers, with an average plot size of almost five acres.

In order to gain insight into the available labour for farming tasks within the households, for each household the number of farm labour equivalents (f.l.e.) was calculated (Table 4.1).¹⁵ The number of farm labour equivalents runs more or less

¹⁵ The number of farm labour equivalents consists of the number of persons engaged in farming, standardized for age and according to the other activities they are involved in. For calculation, see Appendix 35.

Table 4.1
Land and labour, by study group

	(N=)	permanent labourers (44)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• acres		0.9*	0.5	2.1	4.8
• landless (%)		19.1	49.0	13.3	8.6
• over 3 acres (%)		8.5	-	20.6	48.6
• farm labour equivalents		1.2	0.9	1.8	2.8
• farm labour equivalents/acre		0.7	1.8	0.9	0.6

* Three permanent labourers owning a comparatively large piece of land (of 5.5, 15 and 26 acres, respectively) outside the farm have been excluded. If these cases are included, the average plot size becomes 1.8 acres.
Source: Appendix 9

parallel with plot size, being somewhat less than one f.l.e. per acre. With roughly twice the number of f.l.e. per acre, the resident casuals formed an exception.

Maize is the main crop in Trans Nzoia. Almost all households with a plot of land cultivated maize and beans (Table 4.2). Some households living on the large farms were not allowed to plant maize because of the proximity of fields with seed maize. However, this restriction seemed to apply to relatively few households, because almost 90% of the households living on a large farm and with access to a piece of farm land appeared to cultivate maize (see Appendix 10). Apart from maize and beans, Irish potatoes, sweet potatoes and bananas are the other staple crops cultivated in Trans Nzoia. As can be seen in Table 4.2 these crops were mainly grown by households living outside the large farms. Only about 10% of the households grew vegetables (other than the small

Table 4.2
Cultivation of staple crops, by study group
(%)

	(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• maize		72.3	43.1	81.8	88.6
• beans		66.0	37.3	75.8	85.7
• other staples		8.5	11.8	46.7	48.6

Source: Appendix 10

quantities of vegetables grown in the tiny home gardens¹⁶) and about 5% any type of fruit. It is noteworthy that in only one of the 98 households living *on* large farms some vegetables were cultivated and in not a single one fruits (see Appendix 10).

With the exception of one household cultivating some sugar cane, typical cash crops were not cultivated at all in the sampled households. However, many households sold some staple crops now and then in order to obtain some cash.

Table 4.3 shows the calculated value of staple production.¹⁷ It is not surprising that the production value, either measured per household or per consumer unit, in the group of resident casuals was very low indeed and among the non-labourers by far the highest. In other words, labourers, and the labourers living on the large farms in particular, produced much less food than non-labourers.

Table 4.3
Production value of staple crops, by study group
(KSh)

	(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• per household		1735	833	3484	7990
• per consumer unit		348	162	667	1497

Source: Appendix 11

The answers on the question to what degree the household was usually able to grow enough food to feed the family throughout the year, confirmed the latter conclusion (see Table 4.4). Only 5% of the households living on the farms were usually self-sufficient regarding staple foods, against 20% of the households in the category of non-resident casuals and over 50% of the non-labourers. It follows that the labourers on the large farms nearly all had to buy food. It is important then to note that many of the households living on the large farms had the possibility to buy maize on the farm at a relatively low price. This might help them to overcome periods of food shortages (see Foeken & Verstrate 1992), but because wages were usually low on the large farms, one

¹⁶ A home garden is a very small piece of land around the house with an estimated size of about 0.05 acres. Only some vegetables were usually grown there. Home gardens are therefore not regarded as a 'piece of land' as used in for instance Table 4.1.

¹⁷ The value of staple production has been calculated by estimating a price for 90 kg bags of maize, beans, sweet potatoes, irish potatoes and bunches of bananas, based on prices collected during the survey (for further information, see Appendix 35).

Table 4.4
Food self-sufficiency, by study group

(N=)	permanent labourers (46)	resident casuals (51)	non-resident casuals (163)	non- labourers (34)
• always/usually enough	6.4	4.0	19.8	54.5
• sometimes enough	19.1	7.8	13.0	18.2
• not enough/insufficient	57.5	64.7	50.0	18.2
• does not farm	17.0	23.5	17.2	9.1
total	100	100	100	100

Source: Appendix 12

can nevertheless state that in terms of food security the households living on the large farms were in a quite unfavourable situation.¹⁸

Again not surprisingly, about 65% of the households not able to grow enough food, mentioned lack of land as the main constraint (see Appendix 12). This applied to 78% of the permanent labourers and 86% of the resident casuals. "Not being allowed to grow certain crops" was mentioned by only 10% of the households living on the large farms.

Apart from the cultivation of food crops, some households also kept livestock other than poultry (Table 4.5). Livestock was concentrated in the households living outside the large farms, because households living on the large farms were not allowed to have

Table 4.5
Livestock, by study group

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (34)
• households with livestock (%)	6.4	3.7	47.9	57.1
• livestock equivalents per household	0.2	0.2	1.3	2.1*

* One household with almost 22 livestock equivalents is excluded here. Otherwise, the average would be 2.9.
Source: Appendix 13

¹⁸ The percentage of resident casuals stating "does not farm" in Table 4.4 is much lower than the percentage of landless in Table 4.1. This can be explained by the fact that home gardens were not counted as a plot of land in Table 4.1, but obviously these households did grow some food crops.

livestock. The three households in the group of permanent labourers and the two in the group of resident casuals possessing cows kept their animals outside the large farm.

In order to compare households possessing different types of livestock, the number of livestock equivalents per household can be calculated.¹⁹ This confirms the picture described above: households *on* the farm had on average only 0.2 livestock equivalents, against 1.3 livestock equivalents in the labourers' households living outside the large farms. Again (i.e., in addition to plot size and the value of crop production), the non-labourers are clearly in a better position than the labourers.

4.2 RURAL EMPLOYMENT

Rural employment includes all income-generating activities apart from the cultivation of crops and keeping of livestock. Rural employment can be divided into agricultural employment and non-agricultural employment. Agricultural employment consists of casual wage labour and permanent wage labour on a large farm. Non-agricultural employment concerns other wage labour or self-employment. Wage labour ranges from such activities as teaching and nursing to working in a small shop in a village. Self-employment ranges from activities for which a lot of capital is needed, like running a taxi business, to quite marginal activities such as roasting and selling maize or selling rolls (*mandazi*) along the street.

Data on permanent agricultural labour are presented in Appendix 14. With a few exceptions, this economic activity is limited to the designated group of permanent labourers. Other kinds of economic activities, agricultural casual labour and non-agricultural employment, however, are to a greater or lesser extent spread over all groups. What follows in the present section therefore is a discussion of various aspects of these two categories of economic activities. The basic data can be found in Appendices 15 and 16.

Agricultural casual labour

Table 4.6 presents some relevant data on casual labour on large farms. In the labourers' households, on average 1.7 persons performed casual labour on large farms during the agricultural year of 1988/89 (i.e. from March 1988 to February 1989). Obviously, most persons engaged in this type of activity can be found in the two categories of households

¹⁹ Grade cows, ungraded cows, bulls and oxen are equal to 1.0 livestock equivalent (i.e.), calves (grade and ungraded) 0.33 i.e., donkeys 0.70 i.e., sheep 0.20 i.e. and goats 0.14 i.e.

Table 4.6
Agricultural casual labour, by study group*

	permanent labourers	resident casuals	non-resident casuals	non- labourers
• number of persons per household	1.1	1.7	1.9	-
• number of months per worker	6.0	8.1	6.0	-
• income per worker (sh)	1590	2901	1924	-
• income per working month/worker (sh)	325	358	321	-
• income per month per hh (sh)	292	609	609	-

* For N's, see Appendix 15.

Source: Appendix 15

selected as such. Still, also in the households of the permanent labourers an average of 1.1 persons did casual labour. These concerned the wives and in some cases older children of the heads (who worked as a permanent labourer).

Each worker did casual labour during on average six to eight months (Table 4.6). These were not necessarily whole months, however, as can be deduced from the figures regarding the average income per worker per month. Basing ourselves on the average daily wage for casual labour that was found in the farm survey²⁰ (KSh.12/40), it follows that the labourers from the group of resident casuals worked for 29 days during those months. In other words, they did work for whole months. For the non-resident casuals and the permanent labourers these figures were 26 and 21 days, respectively. The latter figure, like the income figures in Table 4.6, indicates that also for the households of the permanent labourers casual labour was an important source of income.

Appendix 15 shows some more interesting features regarding casual labour on large farms. More than three-quarters of the labourers were engaged in seasonal activities like weeding, planting, harvesting and topdressing. This type of work provided them with a job for about five months a year. There were also casual labourers working as herdsman, watchman, foreman, driver or office worker, types of employment one would not expect to be *casual* labour. Indeed, these people worked as a *casual* labourer for about ten months a year. This is in line with what was found in the farm survey, where 10% of the casual labourers appeared to work for at least 270 days a year.²¹ Further calculation reveals that almost 60% of the resident casuals worked that long. Of the non-resident casuals, 34% performed casual labour for nine months or more. Although this may have been done on more than one large farm, it is nevertheless likely that at least some of them

²⁰ See Foeken & Verstrate 1992.

²¹ See Foeken & Verstrate 1992.

did so on one and the same farm. In other words, not only 'regular casuals' (recruited as casual labourers on a permanent basis and living on the farm) performed casual labour the whole year through, but some non-resident casuals as well.

On average, the labourers in the three categories of casual labourers' households earned about KSh.320/- per working month (Table 4.6). Because the resident casuals worked more days per month than the casuals in the two other categories, their monthly income per labourer was also highest. On household level, monthly incomes were the same in the households of the resident casuals and the non-resident casuals and twice as high as in the households of the permanent labourers.

Non-agricultural employment

Because most households did not grow enough food to feed themselves throughout the year and casual labour provided them with an income for about half a year only, many households had to find other sources of income in order to cover basic needs. However, possibilities to find sources of income outside the farming sector are limited. For most types of non-agricultural wage labour some education is needed and many types of self-employment — like trading, running a business or baking and selling *mandazi* — require at least some starting capital. Agricultural wage labourers often lack both education and capital. This could explain the very small number of persons in the households of the labourers engaged in non-agricultural employment, as is shown in Table 4.7. In particular in the households living on the large farms, hardly anybody appeared to have a job outside the farming sector. This is not surprising, however, as farm owners generally

Table 4.7
Non-agricultural employment, by study group

(N=)	permanent labourers (46)	resident casuals (51)	non-resident casuals (163)	non- labourers (35)
<i>nr. of workers per household</i>				
• wage labour	0.1	0.1	0.4	0.7
• self-employment	—	<u>0.1</u>	<u>0.2</u>	<u>0.2</u>
total	0.1	0.2	0.6	0.9
<i>income per household (sh)</i>				
• wage labour	262	1050	3080	9954
• self-employment	—	<u>243</u>	<u>1494</u>	<u>779</u>
total	262	1293	4574	10733

Source: Appendix 16

forbid their resident-labourers to work outside the farm, on pain of being removed. In the non-labourers' households, on average almost one person was engaged in non-agricultural employment, mainly in wage labour.²²

Despite the restrictions on working outside the large farms, the few persons from the households of the resident casuals who succeeded in doing so, managed to realize an average annual income of almost KSh.1300 per household. Given the difficult circumstances, this may look reasonable, but compared with the non-resident casuals and in particular the non-labourers the amount of money earned this way was very modest indeed. For the permanent labourers on the large farms this source of income was negligible. This is most likely due to the fact that it was the head of the household who already had a permanent job on the farm, but possibly also because the farm owners can control these people better than households of squatters living on the fringes of the farm.

The relatively high average income earned per worker in the group of non-labourers (see Appendix 16) was caused by the large number of persons engaged in jobs like teaching, nursing and office work. For those jobs quite some education is required and they were therefore in most cases not accessible to the group of non-resident casuals (see Table 2.5, p. 15).

4.3 SEXUAL DIVISION OF LABOUR

Table 4.8 shows some aspects of the sexual division of types of employment discussed in the previous section. There are important differences between the three categories of labourers' households on the one hand and the non-labourers' households on the other. In the latter group very few women were engaged in rural employment. For the women in the labourers' households, rural employment appeared to be very normal. The table also shows, however, that they had little choice as regards the type of employment, being mainly bound to casual labour on large farms.

Except for the group of resident casuals, men more often had steady jobs than women (Table 4.8). Men also worked longer than women. This may be due to other

²² The very few self-employed people and, as a consequence, the very modest income from this source is rather surprising. In the in-depth study, where this source of income (as well as other sources) was dealt with at much greater length, self-employment turned out to be more common than wage labour (see Tellegen, Verstrate & Foeken 1992, Tables 3.3 and 3.7). This applied in particular to the non-labourers. It seems that households were more inclined to mention regular, steady jobs while they only mention less regular, less remunerative activities when especially asked about them. In other words, the figures in Table 4.7 on self-employment may be an underestimation.

Table 4.8
Sexual division of rural employment, by study group

	permanent labourers		resident casuals		non-resident casuals		non- labourers	
	M	F	M	F	M	F	M	F
• nr. of persons involved	56	49	56	46	197	215	31	4
• idem, as % of all adult men/women	82	64	79	59	70	69	46	6
• % workers engaged in rur. casual labour	18	84	86	93	65	88	-	-
• % workers engaged in non-agric. empl.	2	6	9	2	24	6	74	50
• nr. of months worked (per worker)	11.1	6.4	10.1	5.4	7.9	6.1	9.7	6.5
• income per worker per month (sh)	462	253	463	298	615	340	1164	1350

Source: Appendix 17

tasks women have, such as the responsibility for food production and all kinds of domestic tasks. This leaves them less time to undertake economic activities outside the household.

The income of women per working month was much lower than that of men (the non-labourers' exception is based on only two women). This was partly caused by the different types of work women and men were engaged in. For example, men were involved in more regular types of casual labour and better paid wage labour for which some education is needed. Another reason can be that women worked fewer days per month than men. Finally, an often heard complaint during the survey was that even for the same type of work women were paid less than men.

4.4 HOUSEHOLD INCOME

Tables 4.9 and 4.10 provide information on the income situation of the households. As mentioned before, total household income comprises the value of the household's own farm activities (crop cultivation and livestock production), the income from agricultural labour (on large farms), and the income from non-agricultural employment (non-agricultural wage labour and self-employment). The household's cash income consists of the latter two categories, plus the earnings from farm sales (crops, animals, milk).²³

As could be expected from the discussion so far, by far the highest average income — both per household and per consumer unit — was found among the households of the

²³ See Appendix 35 for the calculation of several of these income components.

Table 4.9
Household income, by study group

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• total income per household	9625	6950	12131	21714
• total income per consumer unit	2104	1518	2318	4217
• cash income per consumer unit	1698	1363	1484	2497

Source: Appendix 18

non-labourers (Table 4.9). The households of the resident casuals clearly had the lowest incomes. In terms of cash income the differences between the four categories were smaller, however, because the income of the lower income groups, on the farm, consisted for a larger part of money income than the income of the households outside the farm.

Table 4.10
Composition of household income, by study group
(%)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• agricultural wage labour	78.7	80.4	41.5	0.5
• non-agricultural employment	0.7	6.5	18.5	35.8
• farming income	20.6	13.1	40.0	63.4
total	100	100	100	100

Source: Appendix 19

This can also be seen when looking at the composition of the total household income as shown in Table 4.10. The income of the households *on* the large farms was derived from labour on those particular farms. The remainder consisted of the households' own food production. Income from non-agricultural employment was negligible (permanent labourers) or very modest (resident casuals). The other extreme was found with the non-labourers, who derived their income mainly from farming and non-agricultural employment. Finally, the non-resident casuals occupied an in-between position, with labour on large farms and their own farming being about equal compo-

nents of their income. In conclusion then, household income was lower as the dependency on agricultural wage labour was greater.

4.5 CONCLUSIONS

Three elements comprise household income: the income from the households' own farming activities, the income from labour on large farms (either permanent or casual) and the income from non-agricultural employment (either regular employment or self-employment).

The households living on the large farms and working there as casual labourers (the resident casuals) appeared to be the poorest group. There are several reasons for this. First, these households often did not have access to land for food cultivation. Half of them were, in fact, landless. Thus, average farm production was small indeed. Secondly, they were usually unable to engage in non-agricultural employment; mainly because the large farm owners did not allow them to work outside the farm, but also because of their low level of education and lack of starting capital. Hence, for their income the resident casuals depended almost entirely on casual labour on the farm they live on. Sixty per cent of these people worked for at least 270 days on 'their' farm during the year under review. For others, labour and wage income had a more seasonal character. But always it is an insecure source of income, dependent on weather conditions, possible mechanisation, possible dismissal, etc.

Although the permanent labourers experience some of the same disadvantages as the resident casuals — such as the ban on working outside the farm and the restrictions regarding the use of their own plot — they were nevertheless in a somewhat better economic position. First, they had a regular income, be it that the average salary was quite low. Secondly, they had access to a larger plot than the casuals (although still only one acre on average) and were able to realize a higher agricultural production. Moreover, family members of the head of the household (who was the permanent labourer) performed casual labour at the large farm they lived on, just as the resident casuals did. All this resulted in an income that was almost 40% higher than that of the resident casuals.

The next group in increasing sequence of income level were the non-resident casuals. In comparison with the permanent labourers and the resident casuals they had larger plots and were thus able to realize a higher agricultural production. They also had easier access to non-agricultural employment. As a result, their income was on average more than 50% higher than that of the resident casuals. Compared with the permanent labourers, however, their income was only 10% higher.

Finally, with a household income that is 80% higher than that of the former group, the category of non-labourers' households was by far the wealthiest. They obtained this income mainly from two sources. The first source concerned their own farms, because the average plot size of these farms was much higher than that of the other three study groups. The second source was non-agricultural employment, in particular regular employment. The members of the non-labourers' households had a much higher educational level than in the other groups, which qualified them for better-paid jobs.

It must be noted that the groups (i) 'non-resident casuals' and (ii) 'non-labourers' consisted of farming households living outside the farms who (i) either or (ii) not performed casual labour on the index farm. The result should not be interpreted as if it is better for casual labourers to go and live outside the farm (in which case they may even lose the right to work there); instead, the results mean that among the smallholders surrounding the large farms, it is the poorer ones who tend to be engaged in casual work on the large farms. Still, the poorer households are not as poor as casuals who live on the farm, for reasons indicated above.

5. Food consumption

This chapter deals with the food consumption patterns of the households: food habits, food groups, energy and protein intake, origin of consumed food (home versus purchased). The findings are presented per study group. All figures have been calculated as averages per household or per consumer unit. The basic data can be found in Appendices 20-26.

5.1 FOOD HABITS

Appendices 20-23 contain information on the menus of the sampled households on the day prior to the interview, listing the percentage households consuming certain dishes and ingredients as well as the amounts consumed per household. Table 5.1 gives a summary of the ingredients.

Maize meal was by far the most important ingredient, usually eaten as *ugali* and *uji*. Vegetables (cabbage, green leaves) and beans ranked second in importance. The households in the four study groups did not differ much in this respect. Milk, either as a sole drink or in tea, was consumed in two-thirds of the households and in reasonable amounts. Especially among the non-labourers, milk consumption was relatively high. The fact that among the permanent labourers the consumption of milk was also fairly high, may be related to the easy availability of milk on quite a number of farms and usually at a comparatively low price.²⁴

Besides the ingredients listed in Table 5.1, other foodstuffs were consumed either in very small amounts (such as sweet potatoes, irish potatoes and beef) or hardly at all. Examples of the latter were cassava, fruits, eggs and fish. As a whole then, the diet of the sampled households was very one-sided (mainly consisting of maize, legumes and

²⁴ See Foeken & Verstrate 1992.

Table 5.1
Main ingredients, by study group

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (163)	non- labourers (35)
<i>% households consuming</i>				
• maize flour	100	96	96	76
• beans	30	39	53	40
• leafy vegetables	45	39	28	18
• cabbage	68	65	68	56
• fresh milk	64	55	65	67
• sugar	77	80	71	71
• fat	70	61	54	67
<i>average amount consumed (gr/cu)</i>				
• maize flour	436	426	395	314
• beans	105	114	221	145
• leafy vegetables	61	47	38	30
• cabbage	82	72	76	57
• fresh milk	198	172	142	240
• sugar	40	49	30	39
• fat	11	12	7	9

Source: Appendix 21, 22.

vegetables) and predominantly vegetarian (93% of the energy and 85% of the proteins were from plant sources).

5.2 ENERGY AND PROTEIN INTAKE

Individual foodstuffs differ considerably in water and energy content. For that reason, foods are converted into energy or nutrient equivalents. Moreover, households differ in size, sex distribution and age distribution, factors that influence the nutritional needs and the level of food consumption. Therefore, in the remainder of this chapter food consumption is expressed in terms of kilocalories and grams of protein per consumer unit.²⁵

Information regarding energy and protein intake can be found in Appendices 24-26. The data cover the average intake per consumer unit per day, the distribution of the households at different intake levels, the intake composition according to food groups and macro-nutrients, the percentage of energy and protein intake derived from home production in general as well as from the different food groups.

²⁵ For a note on consumer units, see Appendix 35.

Intake levels and composition

Table 5.2 shows the average energy intake per consumer unit on the recall day. Energy intake in the non-labourers' households was higher than in the households whose members perform (either permanent or casual) labour on large farms. On average, the difference amounted to more than 300 kcal per consumer unit.

Compared with the calculated energy requirements of 2960 kcal per consumer unit²⁶, the average energy intake in the three labourers' households was 600-700 kcal below that level. Accordingly, in 25-30% of these households, energy intake was less than 60% of the requirements (i.e. less than 1776 kcal per consumer unit). Rather surprisingly, this also applied to the non-labourers' group.

Table 5.2
Energy intake, by study group

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (163)	non- labourers (35)
• average (kcal/day/cons.unit)	2324	2261	2252	2581
• % households with energy intake				
- 100+% of requirements*	15	24	17	43
- <60% of requirements*	23	29	28	26

* Energy requirements have been calculated at 2960 kcal/day per consumer unit.

Source: Appendix 24

Table 5.3 shows the levels of protein intake in the households of the four study groups. An amount of 50 grams can be calculated as the aggregate safe level of protein intake.²⁷ The table reveals that in all study groups the average protein intake was higher than that. Nevertheless, protein intake was clearly higher in the groups *outside* the large farms.

The composition of the energy intake according to food groups is presented in Figure 5.1.²⁸ The importance of maize meal in the daily diet is once more revealed. The figure shows that the energy composition was very much the same for the four study groups. Cereals contributed 70 to 75% and all other food groups less than 10%. The only

²⁶ Based on WHO/FAO/UNU 1985, 133. This requirement corresponds with around 2000 kcal per capita.

²⁷ Based on WHO/FAO/UNU 1985, Table 55. For calculation, see Appendix 35. It should be noted that this level represents a minimum figure, because it does not account for biological variation between household members in both protein requirements and actual protein intake.

²⁸ For reasons of readability some food groups in Figure 5.1 have been grouped together.

Table 5.3

Protein intake, by study group

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (163)	non- labourers (35)
• average (gr/day/cons.unit)	60	57	66	70
• % households with protein intake				
- 100+% of requirements*	66	57	70	74
- <60% of requirements*	9	14	5	3

* A safe level of protein intake is estimated at 50 grams per consumer unit per day.

Source: Appendix 24

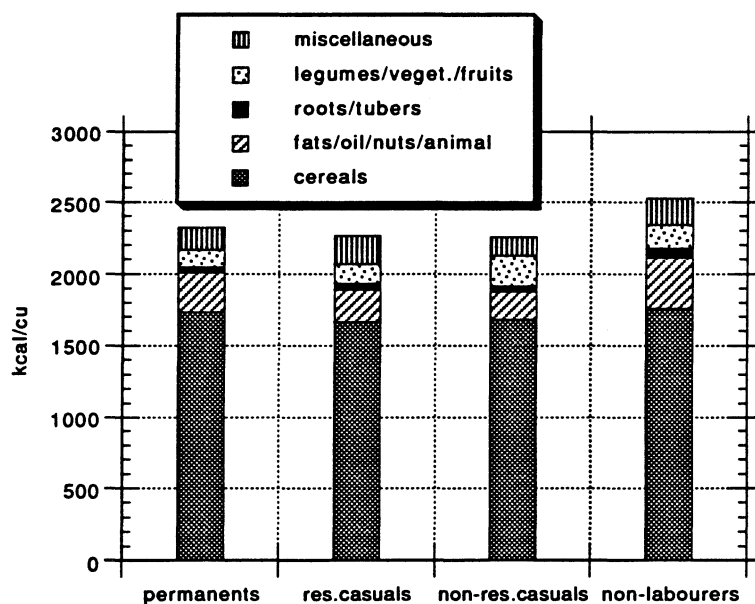


Figure 5.1

Composition of energy intake, by study group

(Source: Appendix 25)

exception concerned the energy from animal products in the group of non-labourers, which was clearly higher (both absolute and in per cents) than in the other groups (see Appendix 25). This was mainly the result of the comparatively high milk consumption.

Origin of energy and protein intake

Figure 5.2 shows which part of the energy and protein intake was derived from home-produced food. As could be expected from the production value of staples (see Table 4.3) as well as from the qualitative data regarding food self-sufficiency (see Table 4.4), the degree of food self-sufficiency among the households living *on* the farms was much lower than among those living outside the farms. In the households living *on* the large farms only 16% of the energy intake and 25% of the protein intake was derived from their own production. For the households *outside* the farms these figures were 34% and 43%, respectively.

Figure 5.2 not only shows substantial differences between households living on and living outside the farms, but also that the group of non-labourers — despite their comparatively large plots (Table 4.1) and their comparatively high production value of staples (Table 4.3) — still obtained less than half their energy intake from their own production. It must be noted, however, that half the households in this group had a plot

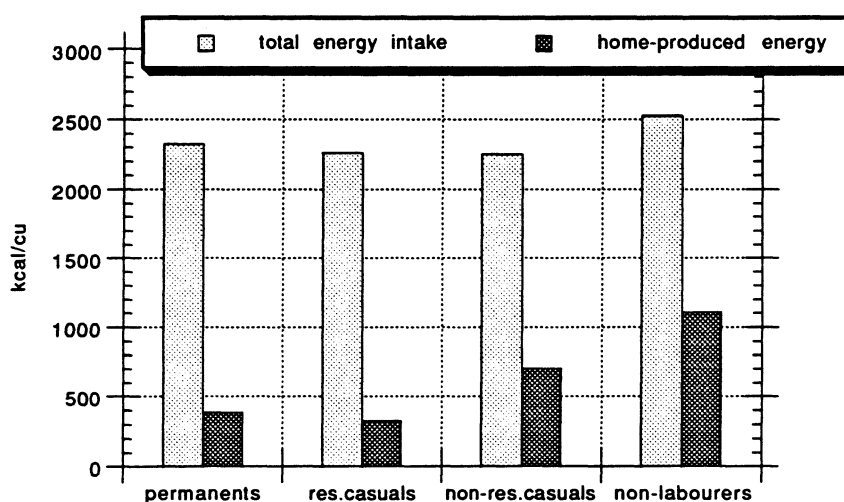


Figure 5.2
Energy intake and home-produced energy, by study group
 (Source: Appendix 26)

of less than three acres (see Appendix 9). It was (obviously) in the households with a reasonable plot size (over three acres) that home-produced energy covered a large part of the energy needs. This applied also to about one-fifth of the non-resident casuals.

A look at the different food groups (Appendix 25) reveals some differences between the study groups. Regarding legumes and vegetables, all groups were to a more or less large extent self-sufficient, but regarding roots, tubers and starchy staples only the households outside the large farms managed to reach a fairly high level of self-sufficiency. To a lesser extent, the same applied to cereals and animal products. These differences reflect the differences in plot size and the restrictions regarding land use for the households on the large farms (as they were, for instance, forbidden to keep live-stock).

5.3 CONCLUSIONS

The daily diet of the study population predominantly consisted of maize meal, legumes and vegetables. Three-quarters of the energy intake was derived from maize alone. The four study groups hardly differed in this respect. The only animal product that was consumed in appreciable quantities was fresh milk.

Overall, the level of energy intake was rather low. In only one-fifth of the households the recommended level per consumer unit was reached. Regarding protein intake, the situation was better. In comparison with the group of non-labourers, the three categories of households with one or more labourer on a large farm all showed a low level of energy intake. This partly reflects differences in household income: the higher the household income the higher the energy intake.

Most food had to be bought. This applied in particular to the households living on the large farms, who depended for 85% of their energy intake on purchased food. Still, even the group with the largest plots and the highest food production bought over half the food consumed.

In this context, it should be mentioned that the consumption data were collected in July — i.e. a month during which food from the previous harvest is finished — and that this does not necessarily reflect the situation throughout the year. However, the months of June to September are indeed regarded by respondents as the most difficult ones as far as food security is concerned (Tellegen et al. 1992). During these months many households — and especially the ones on the large farms — are forced to buy almost all the food they need, putting a heavy burden on their (scarce) financial resources.

6. Nutritional status

This chapter contains data on the nutritional status of the study population. Of all children aged between 6 and 120 months height and weight were measured and expressed in the usual anthropometric indicators, i.e. height-for-age, weight-for-height and weight-for-age (see Box 1, p. 42). Weight and height of the children's mothers were also measured. Detailed data on the mothers can be found in Appendices 27 and on the children in Appendices 28-34.

6.1 THE MOTHERS

Information was collected for almost 350 women. Because only the mothers of the children up to ten years of age were measured, the group of adult women is mainly restricted to women of child-bearing age (see Appendix 27). The results are presented in Table 6.1.

Table 6.1
Mothers: anthropometry, by study group
(averages)

(N=)	permanent labourers (52)	resident casuals (55)	non-resident casuals (185)	non- labourers (38)
• weight (kg)	54.9	53.2	55.6	58.7
• height (cm)	160.5	160.9	161.1	162.8
• weight-for-height* (%)	96.9	93.5	97.5	101.1

* The anthropometric data for the mothers were standardized using a table for weight-for-height published by Jelliffe (1966).

Source: Appendix 27

Box 1**Anthropometric indicators**

It is general practice to standardize height and weight measurements mutually and for age by calculating height-for-age, weight-for-height and weight-for-age with the aid of international growth references. In this study the reference values of the WHO (1983) reference population were used.

Height-for-age expresses the height of a child as a percentage of the corresponding median height of children of the same age in the reference population. Height-for-age values of 90 per cent or less are generally regarded as evidence of stunting, indicating that the child has failed to grow satisfactorily during lengthy periods in the past. Therefore, height-for-age is commonly regarded as an indicator of nutritional history reflecting social and economic conditions.

Weight-for-height expresses the weight of a child as a percentage of the corresponding median weight of children of similar height in the reference population. Weight-for-height values below 80/85 per cent can be regarded as evidence of wasting, indicating acute malnutrition. Different values of weight-for-height (80, 85, 90) have been used as critical cut-off point by different authors. In the present report we have used w-h(85), as this comes closest to the mean minus two standard deviations, which is commonly used in the alternative way of classification (using "z-scores"). Weight-for-height is an indicator of present nutritional condition, easily influenced by health and showing the greatest variation among young children.

The weight of a child can also be expressed in terms of *weight-for-age*, often used as a 'shortcut measure' because it reflects both previous growth and present nutritional condition and is used for a broad classification of malnutrition. Children with less than 60 per cent of the standard weight for their age are generally regarded as severely malnourished, while those with a weight-for-age between 60 and 80 per cent as malnourished.

There are important differences between the women in the four study groups. The women in the non-labourers' group were heavier than in the three categories of labourers' households. And because they were only slightly taller than the other three groups, their average weight-for-height was also much better (101.1%). The women in the households of the resident casuals clearly had the poorest nutritional condition at the time of the survey, with an average weight-for-height of only 93.5%.

6.2 THE CHILDREN

A total number of 1004 children between 6 months and 10 years of age were examined during the survey. Of these, 48% were girls and 52% boys (see Appendix 28). In Appendices 30-34 the results are presented according to three age groups (6-23, 24-59 and 60-119 months). In the text, only the children of 6-23 and 24-59 months are taken into account. Moreover, the two age categories are put together, because otherwise numbers are too small. Where necessary, reference is made to specific age groups.

In Table 6.2 some main results are compared with earlier national surveys.²⁹ The present survey reveals that among the children in households engaged in labour on large farms (and most rural households in Trans Nzoia probably are) no less than 23% of the children were stunted. This percentage was higher than the national figure of 1987 and also higher than the Trans Nzoia figure of 1982. The same applied to the percentage children that could be considered wasted.

Table 6.2
Summary of anthropometry from various sources

	year of survey	reference	no. of children	age group (months)	average H-A	% children <HA(90)	average W-H	% children <WH(80)
Kenya: rural	1987	CBS 1991	6957	6-60	95.6	19.6	101.0	2.5
Tr. Nzoia: rural	1982	CBS 1983	103	3-60	95.2	19.1	102.5	2.8
Tr. Nzoia: rural	1987	CBS 1991	291	6-60	97.1	3.2	98.3	2.5
Tr. Nzoia: labourers*	1989	this report	486	6-59	94.6	23.0	95.4	4.1

* The category of non-labourers is excluded here.

²⁹ The Trans Nzoia figures of the CBS survey of 1987 can not be used because the then used study population was far from representative for the district population (information from CBS).

In Figure 6.1 the average height-for-age and weight-for-height of the children per study group are presented. For three of the four study groups — the resident casuals, the non-resident casuals and the non-labourers — height-for-age figures were more or less in line with the income figures (see Table 4.9): the average height-for-age was lowest among the children in the group with the lowest average income (the resident casuals), highest in the group with the highest average income (the non-labourers), with the group of non-resident casuals in both respects in-between. The fourth group, i.e. the permanent labourers, however, clearly deviates from this pattern: the average income in this group was the second lowest, while average height-for-age of the children was highest. A breakdown according to age groups (Appendix 32) shows that the cause of this high height-for-age could be found in the tallness of these children at very young age (6-23 months).³⁰ As the children grew older, however, height-for-age continuously declined. In contrast, the children in the group of non-labourers showed the reverse trend, while the height-for-age level of the children in the two groups of casual labourers remained fairly constant. Assuming that height-for-age reflects the environmental circumstances in which a child grows up, these circumstances were evidently not favourable for the children of the permanent labourers on the large farms .

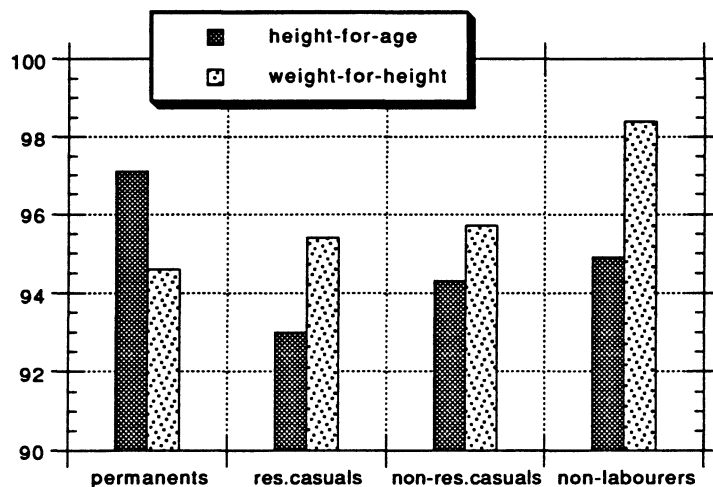


Figure 6.1
Children: height-for-age and weight-for-height, by study group
 (children 6-59 months; source: Appendix 31, 32)

³⁰ This may tentatively be attributed to a better start in life, but data are lacking to confirm this.

The differences in average weight-for-height of the children in the three labourers' categories were quite small. Moreover, weight-for-height of these children was substantially lower than that of the children of the non-labourers. This picture reflects the average levels of energy intake (see Table 5.2). Once more, however, the group of permanent labourers formed an exception: the children's weight-for-height in this group was lower than one might expect from the energy intake figures. Undoubtedly, this can be related to the relatively high height-for-age of the very young children (6-23 months); not only were they tall, but also thin.

Table 6.3 shows for each study group the percentages of children that were in some way malnourished. The percentages of children being stunted in the four study groups reflect the average height-for-age figures presented in Figure 6.1. Stunting appeared to be very common among the children of the resident casuals (29%) and was also widespread among the non-resident casuals (25%). But even in the wealthiest group, i.e. the non-labourers, still one out of each six children were stunted.

About ten per cent of the children in labourers' households were wasted (here defined as a weight-for-height below 85% of the reference). In the households of the non-labourers very few wasted children were found.

Table 6.3

Children: malnutrition, by study group*
(% children of 6-59 months)

		permanent labourers	resident casuals	non-resident casuals	non- labourers
• stunted	<HA(90)	10.8	29.0	25.3	17.1
• wasted	<WH(85)	13.1	11.8	8.6	1.3
• malnourished	<WA(80)	22.5	31.0	31.2	28.3
• severely malnourished	<WA(60)	1.2	2.4	2.1	-

* For N's, see accompanying appendices.
Source: Appendices 31-33.

An indicator for the overall nutritional condition of children is weight-for-age. Children with a weight-for-age of less than 80% of the reference are generally considered malnourished. This applies to no less than almost one-third of the children in the households of casual labourers (both resident and non-resident casuals). Nevertheless, this percentage is only slightly higher than that of the non-labourers.

Severe malnutrition — i.e. a weight-for-age of less than 60% of the reference — was not found among the children of the non-labourers. However, among the casual labourers, more than 2% of the children could be considered severely malnourished.

In sum then, stunted, wasted and generally malnourished children were found in all four study groups, but in particular in the households of casual labourers. In this respect it appears to make no difference whether these households reside on or outside the large farms.

6.3 CONCLUSIONS

Compared with the results of the Third Rural Child Nutrition Survey, held in 1982 and reflecting the general nutritional condition of the children in rural Trans Nzoia, the nutritional condition of the labourers' children seven years later was worse. Of all labourers' children between 6 and 60 months, 23% were stunted and 10% wasted. Moreover, 30% of these children could be considered generally malnourished and 2% severely malnourished. In general, the children in the households of the resident casuals appeared to be worst off. Compared with the labourers' children, the children of the non-labourers were in a better condition (17% stunted, 1% wasted, 28% generally malnourished and none severely malnourished). The differences between the study groups partly reflected differences in household income (height-for-age) and differences in energy intake (weight-for-height).

As far as the nutritional condition of the mothers was concerned, substantial differences between the study groups could be discerned. The women in the households of the non-labourers appeared to be in good condition, while the women in the households of the resident casuals showed the lowest weight-for-height.

7. Conclusions

7.1 INTRODUCTION

Trans Nzoia is often called the 'maize granary' of Kenya. Large surplusses of maize are produced in order to feed the nation. Nevertheless, it is a well-known fact that among certain strata of the district population food deficiency and malnutrition occur. This was first recognized in the District Development Plan 1979-83 (MEPD 1980, 12):

Poverty in the District is [also] to be judged by the malnutrition cases that are now beginning to appear on the company, cooperative, partnership, forest and settlement fund Trustee farms.

In the same document, poverty and malnutrition were related to various factors (p. 58):

With the land subdivisions (...), many farms have holdings as small as 1,5 acres pieces. The family sizes have remained on the average of about 6 persons per household. Because many of such farmers have become maize farming addicts and also because of lack of credit facilities available to them from loaning sources, cases have begun to appear in the District of kwashiorkor and marasmus.

Since then, the prevalence of malnutrition was observed in the successive District Development Plans. According to the latest Plan (1989-93), the problem has grown worse since 1980 (MPND 1989, 49):

The incidence of malnutrition is very high in the District. (...) Though Trans Nzoia is rich agriculturally, it has one of the highest incidences of malnutrition in the country. The reason is that a large proportion of the population is composed of squatters and landless who suffer from food deficiency.

The purpose of the present study was to trace and analyse the nutritional conditions in the households of those who can be regarded as essential in the production of the food

surplusses in Trans Nzoia District, i.e. the labourers on the large farms. Three types of labourers were distinguished: (-) permanent labourers; (-) casual labourers living on the large farms, i.e. 'resident casuuls'; and (-) casual labourers living outside the large farms, i.e. 'non-resident casuuls'. For comparison purposes also a group of non-labourers was selected. What follows in the remainder of this section (7.1) is based on the results of the farm survey of 1989.³¹

In July 1989, between 3,500 and 4,000 permanent labourers were employed on the large farms in Trans Nzoia. The vast majority of them were living in labour camps on the farms. They earned monthly salaries, but these appeared to differ considerably, not only between the different labour types but also between the farms for the same types of work. On nearly all farms, the permanent labourers were provided with a (small) piece of land (on average one acre), a house, water supply, a latrine, and basic medical services. On most farms (70%) the labourers had the opportunity to buy maize from the farm's stock at a price considerably lower than the market price. Finally, on one-third of the farms also milk could be bought at low prices.

Two categories of casual labourers living on the large farms could be distinguished. First, there was the group usually denoted as 'squatters', i.e. people occupying a piece of land on the farm, without having a legal title to that land. They usually lived on the fringes of the farm and were obliged to work for the owner as casuuls when necessary. Second, there were casual labourers who were recruited by the owners/managers as so-called 'regular casuuls'. They usually lived in the same labour camp as the permanent labourers. These regular casuuls performed casual labour for at least nine months a year on one and the same farm. Although differences existed between the two types of 'resident casuuls', the similarities — in terms of household resources — were of more importance: both groups had little or no land and, partly because of that, mainly depended for their livelihood on performing casual labour on the farm. This is exacerbated by the fact that these people were usually not allowed to perform labour outside the farm. On the other hand, they often enjoyed the same provisions as the permanent labourers.

Casual labourers living outside the large farms concerned mainly smallholders and their family members living on a nearby sub-divided large farm. As a rule, these people only worked on the large farms during peak periods. Compared with the casuuls living *on* the farm, they seldom enjoyed benefits (such as cheap maize and/or milk) on the farm(s) where they worked. However, they did not experience the restrictions regarding the employment elsewhere, which placed them in a comparatively favourable position.

³¹ See Foeken & Verstrate 1992.

Finally, the category of non-labourers consisted of those households in which nobody had performed any casual labour on a large farm during the year prior to the survey. These households were expected to be more wealthy than the households in the three labourers categories, as suggested by the fact that they did not *have* to do casual labour in order to make a reasonable living.

7.2 RESULTS

Living conditions

Table 7.1 summarises the findings regarding some important aspects of the people's living situation, i.e. household size, the presence of a latrine, the availability of clean drinking water, and living density (measured as the number of occupants per room in the compound). Households outside the large farms were somewhat larger than those on the farm. Latrines were more common among the households living outside the large farms. With clean drinking water, however, it was the other way around. Regarding living density, the situation among the non-labourers was rather more favourable than among the other three groups.

Table 7.1
Summary of living conditions, by study group
(averages)

	(App.)	permanent labourers (N=47)	resident casuals (N=51)	non-resident casuals (N=165)	non- labourers (N=35)
• household size (nr. of persons)	(5)	7.4	7.4	8.8	8.9
• latrine (% households)	(6)	57	65	84	96
• improved drinking water (% hholds)	(8)	51	42	10	8
• living density (occupants/room)	(5,6)	4.1	4.5	4.1	3.1

Household resources

Table 7.2 shows two important household resources: land and total household income. Average plot sizes differed substantially among the four study groups. Resident casuals had little land at their disposal. Half of them were entirely landless and another 30% had one acre or less. The remaining households had either 1.5 or 2 acres. The situation of the permanent labourers was hardly better. As the resident casuals, three-quarters of them had

a plot of only one acre or less, be it that the percentage of households without access to land in this group was smaller. The non-resident casuals had on average more land than the labourers living *on* the farm. However, the group was quite heterogeneous in this respect: almost half of them had one acre or less, but another fifth had three acres or more. Finally, the non-labourers had on average a reasonable piece of land. The landless in this category were households in which (at least) one member had a regular job (like teachers).

Table 7.2
Summary of household resources, by study group
(averages)

	(App.)	permanent labourers (N=47)	resident casuals (N=51)	non-resident casuals (N=165)	non- labourers (N=35)
<i>land</i>					
• plot size (acres)	(9)	0.9*	0.5	2.1	4.8
• % landless households	(9)	19	49	13	9
• % households with ≤1 acre	(9)	74	78	45	17
<i>total household income (sh)</i>					
• per household	(18)	9,625	6,960	12,131	21,714
• per consumer unit	(18)	2,104	1,518	2,318	4,217

* Three permanent labourers who owned a comparatively large piece of land (of 5.5, 15 and 26 acres, respectively) outside the farm are excluded.

Household income includes a cash and a non-cash component. Cash income is derived from farm sales, earnings from agricultural labour (on large farms) and income from non-agricultural employment (regular employment and self-employment). Non-cash income concerns the value of the food consumption from the own farm and the added value of the household's livestock (off-take rate). Table 7.2 shows that the resident casuals were by far the poorest of the four groups. Because they had hardly any land and were not allowed to seek employment outside the farm where they lived and worked, 80% of their income was derived from casual labour on the large farms. The permanent labourers also depended for about 80% on labour on the farms for their livelihood, but because most of their earnings came in the form of monthly salaries, their total income was higher than that of the resident casuals. Average income in the group of non-resident casuals was about 25% higher than that of the permanent labourers, and 75% higher than that of the resident casuals. If corrected for household size the differences are smaller, because the households of the non-resident casuals were larger. The non-labourers were

by far the wealthiest group. This confirms the hypothesis that these households did not need to perform casual labour in order to make a living.

In order to interpret the absolute income levels of the four study groups, the figures are compared with the average monthly consumption expenditures of *all* rural households in Kenya in July 1989 (i.e. at the time of the survey).³² Two expenditures' figures are presented in Table 7.3, one for the expenditures on food (which includes the value of home-produced food) and one for the expenditures on all items, i.e. including clothing, household goods, education, transport, etc. The latter expenditure level can be denoted as the *average livelihood level* of the rural population in Kenya, weighted for household size. Although the expenditure figures are estimates, they nevertheless enable us to assess the livelihood level of the four study groups.

Table 7.3
Monthly income and estimated monthly expenditures*, by study group
(averages)

	permanent labourers (N=47)	resident casuals (N=51)	non-resident casuals (N=165)	non- labourers (N=35)
<i>monthly income (sh/hh)</i> (this survey)	802	579	1011	1714
<i>estimated monthly expenditures (sh/hh)</i> (Rural Household Budget Survey 1981/2)				
• on food	678	678	840	840
• on all items	1028	1028	1328	1328

* Monthly expenditures refer to July 1989, are calculated from the Rural Household Budget Survey 1981/82 and are corrected for 1989 prices and household size. Because permanent labourers and resident casuals fall within one household size category and non-resident casuals and non-labourers in another, average expenditures are the same for these groups. The figures refer to the average actual expenditures of all rural households in Kenya and include the value of home-produced food, which makes them comparable with the income figures. For method of calculation, see Appendix 35.

Table 7.3 shows that the average monthly income of the resident casuals did not even reach the average level of food expenditures in rural Kenya, let alone the expenditures on all items. The average income of the permanent labourers and the non-resident casuals did exceed the average level of expenditures on food, but was lower than the total expenditure level. It is only in the group of non-labourers that income clearly exceeded the average expenditure level. The conclusion is that the resident casuals in particular must be considered a very poor group.

³² Calculated from the Rural Household Budget Survey 1981/82. For method of calculation, see Appendix 35.

Food consumption

Average energy intake, measured in kilocalories per day per consumer unit, is shown in Table 7.4. Compared with a calculated energy requirement of 2960 kilocalories per day per consumer unit (equalling about 2000 kcal per capita), the average energy intake in all four groups was rather low. This applied in particular to the three groups of labourers' households. It is noteworthy that, despite the differences in income, the average energy intakes of these three groups were almost the same.

Table 7.4

Summary of energy intake, by study group
(averages)

	(App.)	permanent labourers (N=47)	resident casuals (N=51)	non-resident casuals (N=165)	non- labourers (N=35)
• average energy intake (kcal/day/cu)	(24)	2324	2261	2252	2581
• percentage home-produced	(25)	17	15	31	43

Table 7.4 also shows that the households living on the farms had to buy nearly all their food. Obviously, this was due to the very small plots of land for cultivation these households had at their disposal. Still, also in the households of the non-resident casuals two-thirds of the energy intake was derived from purchased food, and even the non-labourers, with their comparatively large plots, did not cover half their energy needs with home-produced food. In this context, it is important to note that on 70% of the large farms in the farm survey³³ the permanent labourers and the resident casuals were able to buy relatively cheap maize, i.e. at a price of on average KSh.35/- per *debe* (instead of the market price of KSh.45/-). Hence, with the same income the households on the farms could buy more maize than the households outside the farms. As 75% of the energy intake in the households of the three groups of labourers was derived from cereals, this factor may well explain why energy intake in the households *on* the farms was the same (resident casuals) or even higher (permanent labourers) than that of the non-resident casuals.

³³ The farm survey consisted of 46 farms of 100 acres or more (see Foeken & Verstrate 1992).

Nutritional status

A summary of the data on the nutritional condition of the children between six months and five years of age and of their mothers is presented in Table 7.5. To start with the mothers, the figures demonstrate a comparatively poor nutritional status in the group of resident casuals and a good nutritional condition in the group of non-labourers, with the two other categories in-between.

Table 7.5
Summary of nutritional status, by study group*
(averages)

	(App.)	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>mothers:</i>					
• average weight-for-height	(27)	96.9	93.5	97.5	101.1
<i>children 6-59 months:</i>					
• average weight-for-height	(31)	94.6	95.4	95.7	98.4
• percentage wasted (WH<85)	(31)	13.1	11.8	8.6	1.3
• average height-for-age	(32)	97.1	93.0	94.3	94.9
• percentage stunted (HA<90)	(32)	10.8	29.0	25.3	17.1
• % severely malnourished (WA<60)	(33)	1.2	2.4	2.1	-

* For N's, see the respective Appendices.

About ten per cent of the children in the three categories of labourers' households appeared to be wasted (i.e. a weight-for-height below 85% of the reference), and another 23% was stunted (i.e. a height-for-age below 90% of the reference). With 25-30% of the children being stunted, the situation was particularly grave in the households of the casual labourers.

7.3 VULNERABLE GROUPS

As pointed out in the introduction of this chapter, the successive District Development Plans always refer to two particularly vulnerable groups in Trans Nzoia, notably squatters and landless households. In the present section, special attention will be paid to these two groups. In order to do so, two sub-analyses will be carried out, one by means of a breakdown of the category of resident casuals into a sub-group of squatters and a sub-group of regular casuals, and another one by dividing the category of non-resident casuals into sub-groups according to farm size, including a category of landless households.

Squatters and regular casuals

Forty-five per cent of the group of resident casuals could be classified as squatters, the remainder being households of regular casuals. In Table 7.6 some characteristics of the two sub-groups are presented.³⁴ The two groups show certain similarities. Firstly, they have very little land: 70% and 86% respectively had access to only one acre or less. Secondly, the average household income is low, particularly in the households of the squatters. Most or nearly all of this income is derived from casual labour on large farms. Thirdly, energy intake is low, but again in particular in the households of the squatters.

The nutritional condition of the mothers in the households of the regular casuals is rather poor, certainly compared with the squatters. As far as the nutritional condition of the children between six months and five years of age is concerned, the two groups show substantial differences. Wasting is very common among the children of the squatters, but

Table 7.6
Characteristics of 'squatters' and 'regular casuals'

	'squatters'	'regular casuals'
<i>households:</i>	(N=23)	(N=28)
• plot size (acres)	0.7	0.4
• household size (persons)	8.1	6.9
• household income (sh/cu)	1180	1796
• income from rural casual labour (sh/cu)	824	1568
• idem, as % of household income	70	87
• energy intake (kcal/day/cu)	2076	2412
<i>mothers:</i>	(N=25)	(N=30)
• average weight-for-height	96.5	91.1
<i>children 6-59 months:</i>	(N=34)	(N=41)
• average weight-for-height	95.1	95.7
• percentage wasted (WH<85)	20.6	4.9
• average height-for-age	94.1	92.1
• percentage stunted (HA<90)	23.5	34.1

³⁴ Regarding the study group of resident casuals, a sampling problem occurred. On only 3 of the 46 farms comprising the farm survey, enough households of this category were present for sampling purposes. As a result, the 'squatters' in Table 7.6 are from one (very) large farm only. There is no reason to believe, however, that their situation is different from the 'general squatters' in the district. Concerning the 'regular casuals', these households were selected on three large farms, of which the majority on a very large ADC-farm. As the level of provisions for the labourers on the two ADC-farms in the farm survey was generally above average (see Foeken & Verstrate 1992), the findings concerning the 'regular casuals' in this section might even deviate in a positive direction from the general situation of the 'regular casuals' in Trans Nzoia.

not among the children of the regular casuals. Apparently, the condition of the children of the regular casuals was better at the time of the survey. This group, however, is conspicuous for its very high percentage of children with a height-for-age below 90% of the reference: no less than one out of every three children in this group appeared to be stunted. In the squatters' households, this was the case with one out of every four children, which obviously is a high proportion as well.

*Landless*³⁵

In Table 7.7 the characteristics of the landless households are listed in the column "0 acres". For comparison, three different farm size classes have been added. All households are derived from the category of non-resident casuals.

The group of landless households distinguishes itself in various ways from the non-landless households. For instance, the landless households were smaller. Household income was comparatively low (and not much higher than that of the squatters in the

Table 7.7
Characteristics of 'landless' and 'non-landless' households

farm size (acres):	0	0.1-1.0	1.1-2.9	3.0+
<i>households</i>	(N=20)	(N=52)	(N=57)	(N=34)
• plot size (acres)	0	0.7	2.1	5.8
• household size (persons)	7.0	8.1	8.8	10.8
• household income (sh/cu)	1360	1640	2351	3821
• income from rural casual labour (sh/cu)	786	762	689	607
• idem, as % of household income	58	46	29	16
• energy intake (kcal/day/cu)	2234	2093	2300	2456
<i>mothers</i>	(N=23)	(N=59)	(N=62)	(N=46)
• average weight-for-height	98.5	93.7	99.7	98.8
<i>children 6-59 months</i>	(N=36)	(N=102)	(N=120)	(N=46)
• average weight-for-height	92.4	95.3	96.8	96.3
• percentage wasted (WH<85)	22.2	11.5	6.3	5.5
• average height-for-age	94.4	94.0	94.1	94.9
• percentage stunted (HA<90)	33.3	29.2	24.8	16.4

³⁵ Landless households are defined as households with no land at all or with only a home garden (estimated at 0.05 acres) and with an annual income from non-agricultural employment and/or from farming (livestock) of less than KSh.500 per consumer unit. Thus, households with no land but with a sizable income from non-agricultural employment (such as a teacher) or from cattle are not included. In other words, the category 'landless' consists only of relatively poor landless households. In practice, it meant that two households had to be excluded from the landless category.

previous table), and a substantial part of it was derived from rural casual labour. The mothers' weight-for-height was surprisingly high and one is tempted to relate this to the absence of a plot of land the women had to cultivate. Finally, the nutritional condition of the children in the landless households was very poor, one-fifth being wasted and one-third stunted. However, the percentage of children being stunted in the households with a plot size between 0.1 and 3.0 acres was also very high.

In conclusion, the statement in the District Development Plans that squatters and landless households are very vulnerable groups in the district can be affirmed by the findings of the survey. However, a third vulnerable group should be added, notably the households of the regular casuals on the large farms.

7.4 DISCUSSION

The notion that squatters, regular casuals and landless households are very vulnerable groups in Trans Nzoia District, however, does not alter the fact that there are many permanent labourers and smallholders who are only slightly better-off. The main cause for the difficult situation of these households is the lack of household resources, i.e. (1) shortage of land and (2) insufficient income from wage labour. Most permanent labourers, nearly all resident casuals (squatters and regular casuals) and many of the non-resident casuals suffer from both shortages. The question then rises what the deeper causes are and what can be done about them. We will deal with these questions separately for the households living *on* and the households living *outside* the large farms.³⁶

Households living on the large farms

According to the law, *permanent labourers* should be provided with a plot of land of 0.5 acres. Both the farm survey and the household survey revealed that they had access to on average about *one* acre. On the other hand, one-fifth of the permanent labourers had no land at all. Those who had a plot of land at their disposal were not totally free regarding the use of it, in that it was not always allowed to grow maize, the staple food crop, in case seed maize was cultivated nearby, while livestock was not allowed at all. The farm survey also showed that a smaller plot of land for the permanent labourers was not compensated by better other provisions, e.g. cheaper maize and milk that could be bought from the

³⁶ A number of policy recommendations can be found in Tellegen & Foeken 1992.

farm's stock. Thus, although on average the permanent labourers got more from the farm owners/managers than what they were legally entitled to, on quite a number of farms it was less. Moreover, wages varied considerably between the farms and were often rather low. Other sources of income were out of reach for these households because the farm owners/managers did not allow the labourer's household members to work outside the farm. The only option for these family members was casual labour on that same farm.

The *resident casuals* — sub-divided into regular casuals and squatters — were generally in an even worse situation. The *regular casuals* are were employed by the farm owners/managers as casual labourers and usually lived in the same labour camp as the permanent labourers. Most of them were not provided with any land, however. Just like the permanent labourers, the people in these households were not allowed to work outside the farm. Their only source of income was the casual labour they performed on the farm. So, they were paid on a daily basis, but only during the period that there was work to do. And although many of them worked almost throughout the year, their financial situation was problematic because wages tended to be low (and quite different on the various farms). For many of these households it would be better if the head of the household could become a permanent labourer. An often heard complaint during the survey was that it was very difficult to reach the status of permanent labourer, although the labourer might have been employed as a casual for many years. But even *if* the casual labourer was turned into a permanent one, this might just as easily be reversed again, as it turned out during the survey that on at least one farm permanent labourers had been made into regular casuals (again).

The *squatters* were in a somewhat different position than the regular casuals, even though on the farm where they lived they were used by the farm owner/managers as regular casuals and, as a consequence, they obtained their income mainly from casual labour, too. On average, they had somewhat more land, but the plots were far too small for a reasonable food production. Moreover, they faced the same restrictions regarding its use as the permanent labourers. Although the people of the squatter households were expected to work on the farm, they were — unlike the permanent labourers and the regular casuals — not forbidden to work elsewhere. Nevertheless, it appeared that the main part of these households' income was derived from casual labour on the owner's farm.

According to the law, squatters can attain a certain legal status after which they cannot be thrown off the farm anymore and should be provided with a reasonable plot of land. In other words, squatters can be 'legal' or 'illegal'. Legal squatters are people who already lived on the farm when the present owner took over or who have been living on the farm for an uninterrupted period of ten years. In these cases, the squatter can not be

removed and should be given five acres of land.³⁷ On quite a number of farms in the farm survey, there had been squatters in the past, but in most cases they had been removed, in particular during the mid-eighties. The remaining squatters had on average only 0.7 acres at their disposal.

Households outside the large farms

A large number of casual labourers needed during the peak labour periods are recruited from outside the farms. The large majority of these are smallholders living on nearby subdivided farms. Most of these former cooperative, company or partnership farms had so many participants that after sub-division only small plots were left, usually no more than three acres. For most households, this is too little to make a living, so additional sources of income are needed. One possible option is to do seasonal labour on large farms, even though earnings are quite meagre when compared with other types of employment (such as regular non-agricultural employment or self-employment). However, for other types of employment at least some education and/or a minimum starting capital is needed, two factors that are lacking in most smallholder households. The study revealed that the educational level of the heads of the non-labourers' households was on average much higher than in the labourers' households, which brings regular types of non-agricultural employment within reach of these people.

Within the group of households living outside the large farms and in which one or more members perform casual labour on a large farm, there was a sub-group which could be considered just as vulnerable as most households living *on* the farms, notably the households with no land at all or hardly any. Thirteen per cent of the non-resident casuals appeared to be entirely landless and another sixteen per cent had less than one acre at their disposal. In certain respects, these households were worse-off than the resident casuals. Firstly, quite a number of the landless in this category lived in 'camps' and had to pay a substantial rent for the house they lived in. Secondly, they did not have the opportunity to buy cheap maize and/or milk on the farms where they usually went for work. Moreover, although they did not face the same restrictions on land use and employment as the households *on* the farms, they did not manage to obtain a reasonable income from non-agricultural sources because of lack of education and finances.

In conclusion, the problems the labourers' households face can be summarised as follows:

³⁷ Information from the Ministry of Labour, Kitale, November 1987.

1) In order to make a living, households *on* the large farms are completely tied to the farm owner/manager. Wages are usually quite low, they have very little land and cannot seek additional income sources outside the farm. Hence, nearly all these households are poor to very poor and, as a consequence, very vulnerable in nutritional terms.

2) For households *outside* the farms with too little land and in which no adult household member has a reasonable level of education, almost the only option for obtaining an additional income is performing casual labour on large farms. This places these households in a position that is in many cases just as bad as the labourers' households *on* the farms.

Appendix 1

Migration

(heads of households)

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>A) area of origin (%)</i>				
(N=)	(47)	(51)	(165)	(35)
Trans Nzoia	31.9	33.3	34.5	31.4
Bungoma	17.0	31.4	38.2	28.6
Turkana	25.5	23.5	6.1	-
Kakamega	8.5	5.9	7.3	17.1
Uasin Gishu	4.3	2.0	4.8	-
Busia	2.1	-	3.6	-
Nandi	-	2.0	2.4	2.9
West Pokot	-	-	0.6	8.6
Elgeyo Marakwet	4.3	-	-	2.9
Siaya	4.3	-	0.6	-
other districts	2.1	2.0	1.2	8.5
Total	100	100	99.3	100
<i>B) number of years in Trans Nzoia</i>				
(N=)	(32)	(33)	(108)	(24)
• average number of years	13.6	12.7	17.5	15.0
• distribution (%):				
<=5 years	18.8	21.2	17.9	25.0
5-15 years	50.0	45.5	34.0	33.3
>15 years	31.3	33.3	48.1	41.7
total	100	100	100	100
<i>C) reason for coming to Trans Nzoia (%)</i>				
(N=)	(32)	(33)	(108)	(24)
• to buy farm	-	-	40.7	41.7
• to find work	93.8	90.9	46.3	33.3
• to join family	6.2	6.0	10.2	16.7
• other reason	-	3.1	2.8	8.3
total	100	100	100	100

Appendix 2

Study population: age groups, by residency

		permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>full-time residents</i>	00-10yrs	159	169	627	133
	11-16yrs	46	56	228	49
	17-19yrs	17	21	79	24
	20-29yrs	43	47	152	40
	30-39yrs	33	46	126	22
	40-59yrs	32	19	88	21
	60+yrs	4	4	34	7
	unknown	1	-	3	1
	- subtotal	335	362	1337	297
<i>part-time residents</i>	00-10yrs	-	6	20	
	11-16yrs	1	5	20	2
	17-19yrs	2	2	17	7
	20-29yrs	5	2	31	2
	30-39yrs	1	-	10	-
	40-59yrs	1	1	8	3
	60+yrs	-	1	-	
	unknown	-	-	-	-
	- subtotal	10	17	106	14
<i>non- residents</i>	00-10yrs	1	1	6	1
	11-16yrs	-	2	5	-
	17-19yrs	1	1	5	-
	20-29yrs	2	2	22	4
	30-39yrs	2	2	12	2
	40-59yrs	-	-	4	1
	60+yrs	-	-	-	-
	unknown	-	1	1	-
	- subtotal	6	9	55	8
Total		351	388	1498	319

Appendix 3

Sex, marital status and residency
(adult household members)

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>A) sex (heads of households)</i>				
• males	45	49	140	34
• females	2	2	25	-
total	47	51	165	34
<i>B) marital status (heads of households)</i>				
• married, monogamously	35	39	118	26
• married, polygamously,	10	10	26	8
• single/separated/divorced/widowed	2	2	21	-
total	47	51	165	34
<i>C) residency, by sex (adults)</i>				
• males				
- full-time resident	58	64	207	51
- part-time resident	8	3	46	9
- non-resident	2	4	28	7
subtotal	68	71	281	67
• females				
- full-time resident	72	73	275	63
- part-time resident	1	3	20	3
- non-resident	3	2	16	-
subtotal	76	78	311	66
Total	144	149	592	133

Appendix 4

Education

(adult household members)

		permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>A) average nr. of years of formal education, by sex</i>					
• males		4.9	4.8	5.7	7.4
• females		2.4	2.4	3.7	5.6
<i>B) educational level, by sex (N)</i>					
males	no education	20	16	39	5
	1-4 years	9	15	58	9
	5-8 years	26	31	141	25
	9+ years	12	9	43	29
	• total	68	71	281	68
females	no education	40	42	113	11
	1-4 years	15	12	63	10
	5-8 years	21	23	112	34
	9+ years	1	1	23	11
	• total	77	78	311	66
<i>C) educational level, by residency (N)</i>					
full-time residents	no education	55	52	121	17
	1-4 years	20	25	103	16
	5-8 years	43	51	206	54
	9+ years	12	9	52	34
	• subtotal	130	137	482	121
part-time residents	no education	4	2	16	1
	1-4 years	2	1	12	2
	5-8 years	2	3	28	6
	9+ years	1	-	10	3
	• subtotal	9	6	66	12
non- residents	no education	2	4	15	1
	1-4 years	1	1	6	-
	5-8 years	2	-	19	2
	9+ years	-	1	4	4
	• subtotal	5	6	44	7
Total		144	149	592	140

Appendix 5

Household size

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) persons</i>				
• average	7.4	7.4	8.8	8.9
• distribution (%)				
1-3	2.1	5.9	3.6	2.9
4-5	25.5	21.6	12.7	17.1
6-7	34.0	27.5	20.6	8.6
8-9	19.1	21.6	26.1	25.7
10-14	17.0	23.5	32.1	42.9
15+	2.1	-	4.8	2.8
- total	100	100	100	100
<i>B) consumer units*</i>				
• average	4.7	4.8	5.3	5.4
• distribution (%)				
-1.9	-	-	2.4	-
2.0-3.9	40.4	37.3	18.2	22.9
4.0-5.9	34.0	35.3	42.4	34.3
6.0-7.9	25.5	21.6	33.3	37.1
8.0-9.9	-	5.9	3.6	5.7
10.0+	-	-	-	-
- total	100	100	100	100

* See note on consumer units in Appendix 35.

Appendix 6

Houses

	(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) number of houses</i>					
• average		1.6	1.7	1.8	1.8
• distribution (%)					
1		51.1	52.9	51.5	26.7
2		36.2	29.4	27.9	25.5
3		12.8	11.8	15.8	18.8
4+		-	5.9	4.8	29.0
- total		100	100	100	100
<i>B) rooms</i>					
• average		2.2	2.0	2.8	3.7
• distribution (%)					
1		31.9	43.1	26.7	11.4
2		36.2	31.4	25.5	17.1
3-4		27.7	19.6	32.1	34.3
5+		4.3	5.9	15.8	37.1
- total		100	100	100	100
<i>C) facilities</i>					
• store (%)		36.2	37.3	44.2	57.1
• fire places (average number)		1.1	1.1	1.2	1.2
• latrine (%):					
- individual		23.4	25.5	56.4	74.3
- shared		34.0	39.2	27.9	22.9
- none		42.6	35.3	15.8	2.9
total		100	100	100	100
<i>D) type (%)</i>					
	(N=)	(47)	(51)	(163)	(35)
• self built		12.8	49.0	90.8	94.3
• bought from farm owner		2.1	-	-	-
• bought from labourer		-	2.0	0.6	-
• rented from farm owner		85.1	49.0	0.6	-
• rented from landlord		-	-	8.0	5.7
total		100	100	100	100

Appendix 7

Firewood

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>A) location during wet season (%)</i>	(47)	(51)	(163)	(33)
• on own farm	2.1	2.0	6.7	21.2
• on large farm of employer	87.2	80.4	8.0	-
• elsewhere	10.6	17.6	85.3	78.8
total	100	100	100	100
<i>B) collection time (wet season)</i>	(47)	(51)	(165)	(33)
• hours per week	5.5	4.7	4.5	4.0
<i>C) collected amount (wet season)</i>	(47)	(51)	(162)	(32)
• number of bundles	2.4	2.4	2.7	2.3
<i>D) expenses on firewood</i>	(46)	(51)	(163)	(35)
• shilling per month	28	18	49	54

Appendix 8

Drinking water

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) drinking water source (%)</i>				
• river/pond/well/reservoir	47.8	57.9	82.7	72.9
• improved water source	51.1	42.1	9.7	7.1
• other	1.1	-	7.6	20.0
total	100	100	100	100
<i>B) distance to drinking water source (%)</i>				
• 0-10 minutes	74.5	56.9	52.4	71.4
• 11-30 minutes	18.1	38.2	34.8	25.7
• 31-60 minutes	5.3	4.9	9.7	2.9
• >60 minutes	2.1	-	3.0	-
total	100	100	100	100

Appendix 9

Farm land and farm labour

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) farm land</i>				
• total acreage	1.8	0.5	2.1	4.8
• distribution:				
no land	9	25	22	3
0.1-0.99 acres	16	11	26	2
1.00-2.99 acres	18	15	83	13
3.00-9.99 acres	2	-	30	12
10+ acres	2	-	4	5
<i>B) farm labour</i>				
• nr. of farm labour equivalents	1.2	0.9	1.8	2.8
• farm labour equivalents per acre	0.7	1.8	0.9	0.6

Appendix 10

Crops

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
• nr. of households cultivating crops	38	26	143	31
• idem, by crop:				
- maize	34	22	135	31
- beans	31	19	125	30
- bananas	-	4	30	8
- sweet potatoes	2	2	40	7
- irish potatoes	2	-	7	2
- fruit	-	-	15	-
- vegetables	-	1	26	4

Appendix 11

Staple crops: yields

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) production per household</i>				
• maize (kg)	524	243	995	2634
• beans (kg)	54	29	91	183
• sweet potatoes (kg)	6	7	92	35
• irish potatoes (kg)	1	-	2	1.2
• bananas (bunches)	-	0.0	0.3	1.7
<i>B) production value per household</i>				
• production value (sh)	1735	833	3484	7990
• distribution (N):				
sh 0	11	27	32	4
sh 1-499	6	2	9	1
sh 500-1,499	10	10	21	3
sh 1,500-4,999	18	10	68	12
sh 5,000+	2	2	35	15
<i>C) production value per consumer unit</i>				
• production value (sh)	348	162	667	1497
• distribution (N):				
sh 0	11	27	32	4
sh 1- 99	5	3	11	1
sh 100-499	17	15	47	9
sh 500-999	11	6	44	4
sh 1,000+	3	-	31	17

Appendix 12

Food self-sufficiency

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) "Able to grow enough to feed the family?"</i>				
• always enough food grown	2	1	14	11
• usually enough	1	1	18	7
• sometimes enough	9	4	21	6
• not enough	20	21	68	5
• completely insufficient	7	12	13	1
• does not farm	8	12	28	3
<i>B) constraints concerning food crops cultivation*</i>				
(N=)	(36)	(37)	(102)	(12)
• no land available	28	32	65	4
• no labour available	2	-	5	1
• poor soil	2	-	12	3
• need to sell crops	1	1	4	1
• not allowed to grow crops	1	4	-	-
• other	2	2	19	4

* Only households growing "sometimes enough", "not enough" or "completely insufficient", as mentioned under A. More than one answer was possible.

Appendix 13

Livestock

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) total number of animals</i>				
• graded cow	6	-	62	26
• grade bull	-	-	12	3
• grade calves	-	-	22	23
• ungrade cow	3	4	51	39
• ungrade bull	-	-	33	11
• ungrade calves	-	-	15	9
• ox	-	-	12	2
• donkey	-	-	2	3
• goat	3	3	15	4
• sheep	-	32	155	59
• chicken	244	160	693	170
• duck	11	26	46	18
• goose	4	2	5	1
• rabbit	-	2	29	4
• dove	7	7	56	16
<i>B) number of households with:</i>				
• cows	3	2	55	17
• ox/donkey	-	-	4	3
• sheep/goat	1	5	54	17
• poultry	42	36	141	30
<i>C) number of animals per household</i>				
• cows	0.2	0.0	1.2	3.2
• ox/donkey	-	-	0.1	0.1
• sheep/goat	0.1	0.7	1.0	1.8
• poultry	5.7	3.9	5.0	6.0
<i>D) livestock equivalents*</i>				
• average number	0.2	0.2	1.3	2.9**
• distribution (N):				
no livestock	44	44	86	15
0.1-0.99 l.e.	1	3	24	3
1.0-1.99 l.e.	1	-	18	-
2.0-4.99 l.e.	1	4	28	9
5.0-9.99 l.e.	-	-	5	6
10.0+ l.e.	-	-	4	2

* Livestock equivalents (l.e.'s) consist of cows (both grade and ungraded), bulls, oxen (all 1.0 l.e.), calves (0.33 l.e.), donkey's (0.7 l.e.), sheep and goats (0.14 l.e.).

** There is one household in the group of non-labourers with almost 22 livestock equivalents. When leaving this case out the average becomes 2.4 for the non-labourers.

Appendix 14

Rural permanent labour*

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) persons involved</i>				
• total number of persons involved	51	1	5	2
farm manager	2	-	-	-
foreman	5	-	1	1
dairy worker/herdsman	14	-	1	1
watchman	4	-	-	-
shamba boy/lady	4	-	-	-
farm driver	6	-	2	-
farm office personnel	3	-	-	-
general farm worker	5	1	-	-
other activities	8	-	1	-
<i>B) number of months worked (for N's, see under A)</i>				
• total number of months	11.8	12	12	12
farm manager	12	-	-	-
foreman	12	-	12	12
dairy worker/herdsman	12	-	12	12
watchman	12	-	-	-
shamba boy/lady	12	-	-	-
farm driver	11.8	-	12	-
farm office personnel	12	-	-	-
general farm worker	10.6	12	-	-
other activities	12	-	12	-
<i>C) income earned (sh)** (for N's, see under A)</i>				
• income earned per worker	5348	5760	6072	4680
farm manager	8700	-	-	-
foreman	8136	-	5760	5760
dairy worker/herdsman	3201	-	6000	3600
watchman	2949	-	-	-
shamba boy/lady	4050	-	-	-
farm driver	6480	-	6600	-
farm office personnel	10400	-	-	-
general farm worker	2670	5760	-	-
other activities	7305	-	5400	-

* The permanent labourers in the two categories of casual labourers and in the category of non-labourers concern non-residential household members. The income from this source is only partly included in the calculation of the households' income.

** These are averages for persons undertaking permanent labour, not for households within the different groups. The period concerned is the agricultural cycle of 1988/89 (March 1988 to February 1989).

Appendix 15

Rural casual labour

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) persons involved</i>				
• total number of persons involved	51	91	321	-
seasonal worker	35	45	267	-
dairy worker/herdsman	3	7	12	-
foreman	1	2	1	-
watchman	-	15	5	-
shamba boy/lady	-	-	4	-
farm driver	1	2	6	-
farm office personnel	-	1	1	-
other activities	11	19	25	-
<i>B) number of months worked (for N's, see under A)</i>				
• number of months worked	6.0	8.1	6.0	-
seasonal worker	4.9	6.3	5.5	-
dairy worker/herdsman	6.7	10.6	9.0	-
foreman	5.0	12.0	12.0	-
watchman	-	10.1	11.8	-
shamba boy/lady	-	-	9.3	-
farm driver	2.0	12.0	6.2	-
farm office personnel	-	12.0	8.0	-
other activities	9.2	9.0	8.8	-
<i>C) income earned (sh)* (for N's, see under A)</i>				
• income earned per worker	1590	2901	1924	-
seasonal worker	1092	1899	1741	-
dairy worker/herdsman	2340	3619	2265	-
foreman	5040	5244	1500	-
watchman	-	4417	4368	-
shamba boy/lady	-	-	3075	-
farm driver	900	4740	3267	-
farm office personnel	-	3600	9600	-
other activities	2719	3339	2430	-

* These are averages for persons undertaking casual labour, not for households within the different groups. The period concerned is the agricultural cycle of 1988/89 (March 1988 to February 1989).

Appendix 16

Non-agricultural employment

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) number of persons engaged in</i>				
• wage labour	4	6	66	26
• self-employment	-	4	29	8
total	4	10	95	32
<i>B) income per worker</i>				
• from wage labour (sh)	3075	8927	7701	13399
• distribution (N):				
up to sh 999	1	1	9	3
sh 1,000- 4,999	2	2	33	7
sh 5,000- 9,999	1	1	12	5
sh 10,000-19,999	-	1	5	4
sh 20,000+	-	1	7	7
• from self employment (sh)	-	3094	8500	3406
• distribution (N):				
up to sh 999	-	3	3	1
sh 1,000- 4,999	-	-	11	5
sh 5,000- 9,999	-	-	6	2
sh 10,000-19,999	-	1	6	-
sh 20,000+	-	-	3	-
<i>C) residency of workers (N)</i>				
• wage labour				
- full time residents	-	3	39	18
- part time residents	2	-	12	3
- non residents	2	3	15	5
total	4	6	66	26
• self employment				
- full time residents	-	4	23	8
- part time residents	-	-	4	-
- non-residents	-	-	2	-
total	-	4	29	8

Appendix 17

Rural employment: sexual division of labour

	permanent labourers		resident casuals		non-resident casuals		non-labourers	
	male	female	male	female	male	female	male	female
<i>A) persons involved</i>	56	49	56	46	197	215	31	4
<i>agricultural labour</i>	55	46	49	43	132	190	2	-
• casual labour	10	41	48	43	128	190	-	-
• permanent labour	45	5	1	-	5	-	2	-
<i>non-agricultural labour</i>	1	3	5	1	48	13	23	2
• temporary employment	-	-	2	-	25	2	10	-
• regular employment	1	-	3	-	23	4	13	1
• domestic labour	-	3	-	1	-	7	-	1
<i>self-employment</i>	-	-	2	2	16	12	6	2
• trading	-	-	-	-	1	7	-	1
• self-employment	-	-	2	-	15	3	6	-
• food preparation	-	-	-	2	-	2	-	1
<i>B) months worked</i>	11.1	6.4	10.1	5.4	7.9	6.1	9.7	6.5
<i>agricultural labour</i>	11.0	6.3	10.3	5.7	6.9	5.7	12	-
• casual labour	6.9	5.8	10.3	5.7	6.7	5.7	-	-
• permanent labour	12.0	10.6	12.0	-	12.0	-	12.0	-
<i>non-agricultural labour</i>	12.0	7.0	9.0	2.0	9.5	9.8	9.8	7.0
• temporary employment	-	-	4.5	-	7.8	8.5	8.2	-
• regular employment	12.0	-	12.0	-	11.3	10.0	11.0	12.0
• domestic labour	-	7.0	-	2.0	-	10.1	-	2.0
<i>self-employment</i>	-	-	7.5	1.0	10.9	8.2	8.7	6.0
• trading	-	-	-	-	7.0	5.4	-	12.0
• self-employment	-	-	7.5	-	11.2	12.0	8.7	-
• food preparation	-	-	-	1.0	-	12.0	-	0.04
<i>C) income earned (sh)*</i>	5123	1619	4673	1611	4857	2074	11286	8777
<i>agricultural labour</i>	5107	1587	4022	1691	2442	1701	4680	-
• casual labour	1989	1493	3986	1690	2300	1701	-	-
• permanent labour	5799	2358	5760	-	6072	-	4680	-
<i>non-agricultural labour</i>	6000	2100	10680	160	9723	3199	45928	15740
• temporary employment	-	-	2700	-	4816	3525	5688	-
• regular employment	6000	-	16000	-	15056	3350	20001	31080
• domestic labour	-	2100	-	160	-	3020	-	400
<i>self-employment</i>	-	-	5588	600	10331	6767	3937	1814
• trading	-	-	-	-	2100	3029	-	3600
• self-employment	-	-	5588	-	10880	14600	3937	-
• food preparation	-	-	-	600	-	8100	-	28

* These are averages for persons undertaking rural employment, not for households within the different groups.

Appendix 18

Household income

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) total household income</i>				
• per household (sh) (standard deviation)	9,625 (6,915)	6,950 (4,535)	12,131 (10,746)	21,714 (18,898)
• distribution (N):				
up to sh 2,500	2	10	9	1
sh 2,500-4,999	12	7	28	3
sh 5,000-7,499	9	16	29	4
sh 7,500-9,999	8	9	25	5
sh 10,000-14,999	8	6	32	5
sh 15,000-24,999	5	3	28	7
sh 25,000+	3	-	14	12
• per consumer unit (sh) (standard deviation)	2,104 (1,545)	1,518 (971)	2,318 (1,861)	4,217 (3,855)
• distribution (N):				
up to sh 499	-	8	5	3
sh 500- 999	11	8	24	1
sh 1,000-1,499	14	12	31	3
sh 1,500-2,499	7	15	55	8
sh 2,500-4,999	13	8	35	10
sh 5,000+	2	-	15	10
<i>C) cash income</i>				
• per consumer unit (sh) (standard deviation)	1,698 (1,184)	1,363 (948)	1,484 (1,384)	2,497 (3,010)
• distribution (N):				
up to sh 250	-	2	9	8
sh 250-750	8	12	35	4
sh 750-1,250	17	14	44	4
sh 1,250-1,999	7	12	46	5
sh 2,000-2,999	8	9	15	4
sh 3,000-3,999	5	-	5	3
sh 4,000+	2	2	11	7

Appendix 19

Sources of income

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (165)	non- labourers (35)
<i>A) income earned (sh/cu)</i>				
• <i>agricultural employment</i>	1609	1179	742	17
casual labour	362	1164	701	-
permanent labour	1247	15	38	17
• <i>non-agricultural employment</i>	7	74	330	1496
temporary employment	-	6	83	289
regular employment	6	68	232	1204
domestic labour	1	0	15	3
• <i>self-employment</i>	-	83	233	209
trading	-	-	37	47
self-employment	-	80	182	162
food preparation	-	3	14	-
• <i>farming</i>	487	182	1017	2495
home production	241	129	432	819
farm sales	81	26	182	731
cattle	165	27	403	900
rent	-	-	-	45
total income per consumer unit	2104	1518	2318	4217
<i>B) share of different income sources (%)</i>				
• <i>agricultural employment</i>	78.7	80.4	41.5	0.5
casual labour	16.8	79.3	40.6	-
permanent labour	61.8	1.0	0.9	0.5
• <i>non-agricultural employment</i>	0.7	4.4	12.4	28.5
temporary employment	-	0.3	4.2	10.6
regular employment	0.6	4.1	7.3	17.9
domestic labour	0.1	0.0	0.9	0.0
• <i>self-employment</i>	-	2.1	6.1	7.3
trading	-	-	0.9	1.4
self-employment	-	1.9	4.8	50.9
food preparation	-	0.2	0.4	-
• <i>farming</i>	20.6	13.1	40.0	63.4
home production	14.7	10.3	21.8	27.5
farm sales	3.4	1.3	6.1	13.9
cattle	2.5	1.5	12.1	21.0
rent	-	-	-	1.0
total	100	100	100	100

Appendix 20

Food consumption: dishes

(N=)	permanent labourers (47)	resident casuals (51)	non-resid. casuals (164)	non- labourers (35)	dish nr. (see below)
<i>% households consuming dish listed</i>					
uji	57.4	70.6	59.1	31.1	10
ugali	100.0	92.2	91.5	75.6	11
other cereal dishes	17.0	25.5	31.7	28.9	12,40,41
legume dishes	17.0	19.6	24.4	15.6	30,31,33
roots & tuber dishes	10.6	11.8	4.3	8.9	50,54,55,57
vegetable dishes	93.6	88.2	86.0	66.7	60,67
fish/meat/egg dishes	10.6	9.8	12.2	11.1	44-48
single food items	19.1	15.7	16.5	26.7	99
snacks	4.3	-	0.6	-	15,16
tea	74.5	70.6	65.2	71.1	1
miscellaneous	4.3	9.8	2.4	2.2	2,3,5,83
<i>average amount consumed per household (grams)*</i>					
uji	203	341	313	165	10
ugali	1939	1693	1874	1587	11
other cereal dishes	452	490	988	960	12,40,41
legume dishes	337	360	711	397	30,31,33
roots & tuber dishes	126	153	71	145	50,54,55,57
vegetable dishes	795	607	668	554	60,67
fish/meat/egg dishes	130	37	91	153	44-48
single food items	233	296	219	332	99
snacks	41	-	3	-	15,16
tea	804	498	633	937	1
miscellaneous	9	24	24	1	2,3,5,83
<i>list of dishes</i>					
1 tea	31 peas/beans with roots	54 cassava			
2 coffee	33 groundnuts	55 irish potatoes			
3 cocoa	40 rice	57 sweet potatoes			
5 milk	41 maize & beans/githeri	60 leafy vegetables			
10 uji	44 fish, cooked	67 mushrooms			
11 ugali	45 fish, fried	83 soup			
12 maize	46 meat, cooked	99 any ingredient taken by			
15 chapati	47 meat, roasted	itself, or with addition			
16 mandazi	48 eggs	of salt.			
30 peas/beans	50 bananas				

* The weights concern the sum of the ingredients before preparation, i.e. excluding added water.
The data refer to the results of one-day household recalls.

Appendix 21

Food consumption: ingredients 1

(% households consuming ingredients listed)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (164)	non- labourers (35)
<i>Cereals</i>				
maize: fresh	4.3	3.9	3.0	-
maize: dry	14.9	21.6	29.9	24.4
maize flour	100.0	96.1	96.3	75.6
rice	-	-	-	2.2
wheat flour	4.3	-	0.6	-
millet flour	2.1	-	1.2	-
bread	-	-	2.4	6.7
mandazi	2.1	-	1.2	-
cerelac/biscuits	2.1	3.9	-	2.2
<i>Grain legumes</i>				
pigeon peas	-	-	0.6	-
beans	29.8	39.2	53.0	40.0
groundnut	-	-	0.6	-
green peas	-	-	0.6	-
<i>Roots, tubers & starchy staples</i>				
cassava	-	2.0	-	-
cooking banana	-	-	1.2	2.2
sweet potato	4.3	3.9	6.7	4.4
irish potato	12.8	11.8	3.7	6.7
<i>Vegetables</i>				
leafy vegetable	44.7	39.2	28.0	17.8
tomato	4.3	3.9	5.5	11.1
cabbage	68.1	64.7	68.3	55.6
mushroom	2.1	-	-	-
<i>Fruits</i>				
sweet banana	-	-	0.6	2.2
mango	-	-	1.8	-
citrus (whole or juice)	2.1	-	3.0	-
sugar cane	-	-	0.6	-
passion fruit	2.1	-	-	-

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Appendix 21, continued

Food consumption: ingredients 1

(% households consuming ingredients listed)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (164)	non- labourers (35)
<i>Meats & animal products</i>				
beef	6.4	-	6.7	8.9
other meat	-	-	0.6	-
poultry	4.3	3.9	0.6	-
eggs	-	3.9	3.7	2.2
milk	63.8	54.9	64.6	66.7
fish: fresh	-	-	0.6	-
fish: dried	-	2.0	3.0	2.2
<i>Seeds & nuts</i>				
simsim	-	-	0.6	-
<i>Miscellaneous</i>				
sugar	76.6	80.4	71.3	71.1
soda	-	-	1.2	-
fat/blueband	70.2	60.8	53.7	66.7
beer	-	-	0.6	-
other*	4.3	-	1.8	2.2

* Sweets, main ingredients of prepared drinks, salty ingredients and spices.

Appendix 22

Food consumption: ingredients 2

(average amount consumed per consumer unit, in grams)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (164)	non- labourers (35)
<i>Cereals</i>				
maize: fresh	7	5	6	-
maize: dry	41	41	73	55
maize flour	436	426	395	314
rice	-	-	-	5
wheat flour	7	-	0	-
millet flour	1	-	2	-
bread	-	-	3	11
mandazi	0	-	0	-
cerelac/biscuits	0	1	-	0
<i>Grain legumes</i>				
pigeon peas	-	-	1	-
beans	105	114	221	145
groundnut	-	-	0	-
green peas	-	-	1	-
<i>Roots, tubers & starchy staples</i>				
cassava	-	9	-	-
cooking banana	-	-	2	22
sweet potato	19	14	24	24
irish potato	20	20	12	10
<i>Vegetables</i>				
leafy vegetable	61	47	38	30
tomato	2	6	2	6
cabbage	82	72	76	57
mushroom	6	-	-	-
<i>Fruits</i>				
sweet banana	-	-	0	1
mango	-	-	1	-
citrus (whole or juice)	2	-	2	-
sugar cane	-	-	0	-
passion fruit	0	-	-	-

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Appendix 22, continued

Food consumption: ingredients 2

(average amount consumed per consumer unit, in grams)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (164)	non- labourers (35)
<i>Meats & animal products</i>				
beef	14	-	8	24
other meat	-	-	1	-
poultry	8	6	3	-
eggs	-	1	1	1
milk	198	172	142	240
fish: fresh	-	-	0	-
fish: dried	-	0	3	1
<i>Seeds & nuts</i>				
simsim	-	-	1	-
<i>Miscellaneous</i>				
sugar	40	49	30	39
soda	-	-	0	-
fat/blueband	11	12	7	9
beer	-	-	8	-
other*	0	-	0	0

* Sweets, main ingredients of prepared drinks, salty ingredients and spices.

Appendix 23

Food consumption: food groups
 (grams)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (164)	non- labourers (35)
<i>Average amount consumed per household</i>				
cereals	2340	2170	2508	2713
legumes	524	588	1197	1107
roots, tubers, starchy staples	197	209	189	294
vegetables	694	549	602	655
fruits	12	0	15	3
animal products	1055	728	829	1634
fats, oil seeds, nuts	55	47	41	58
miscellaneous	195	208	215	259
• total	5071	4499	5596	6724
<i>Average amount consumed per consumer unit</i>				
cereals	493	473	479	496
legumes	105	114	224	187
roots, tubers, starchy staples	40	42	38	72
vegetables	151	125	116	119
fruits	3	0	3	2
animal products	220	179	157	341
fats, oil seeds, nuts	11	12	8	11
miscellaneous	41	49	40	50
• total	1063	994	1064	1278

Appendix 24

Food consumption: nutrients

(per consumer unit)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (164)	non- labourers (35)
Energy				
• average (kcal)	2324	2261	2252	2581
• s.d.	756	927	819	862
• distribution: % of requirements*				
100+	15	24	17	43
80-99.9	34	18	27	11
60-79.9	28	29	28	20
<60	23	29	28	26
	100	100	100	100
Proteins				
• average (grams)	60	57	66	72
• s.d.	24	26	29	30
• distribution: % of requirements**				
100+	66	57	70	74
80-99.9	15	20	12	9
60-79.9	11	10	13	14
<60	9	14	5	3
	100	100	100	100
Fats				
• average (grams)	32	28	26	40
• s.d.	26	21	17	27
Contribution macro-nutrients to energy intake				
carbohydrates	1793	1783	1756	1930
proteins	289	252	234	363
fats	242	226	262	287

* Energy requirements are put at 2960 kcal per consumer unit per day.

** A safe level of protein intake is estimated at 50 grams per consumer unit per day.

For calculation, see Appendix 35.

Appendix 25

Food consumption: composition energy

(kcal/day/consumer unit)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (164)	non- labourers (35)
<i>(a) food groups</i>				
cereals	1732	1668	1684	1747
legumes	70	93	175	133
roots, tubers, starchy staples	37	44	39	81
vegetables	43	36	33	35
fruits	2	0	2	2
animal products	174	120	124	278
fats, oil seeds, nuts	103	104	70	121
miscellaneous	162	195	126	202
• total	2324	2261	2252	2581
<i>(b) home-produced</i>				
cereals	270	232	476	836
legumes	70	49	139	101
roots, tubers, starchy staples	6	11	30	53
vegetables	27	25	19	22
fruits	0	0	1	0
animal products	12	9	36	85
fats, oil seeds, nuts	2	3	0	2
miscellaneous	0	0	0	0
• total	385	328	702	1099
<i>(b) as percentage of (a)</i>				
cereals	16	14	28	48
legumes	100	53	79	76
roots, tubers, starchy staples	16	25	77	65
vegetables	63	69	58	63
fruits	0	0	50	0
animal products	7	8	29	31
fats, oil seeds, nuts	2	2	0	2
miscellaneous	0	0	0	0
• total	17	15	31	43

Appendix 26

Food consumption: composition proteins

(grams/day/consumer unit)

(N=)	permanent labourers (47)	resident casuals (51)	non-resident casuals (164)	non- labourers (35)
<i>Food groups</i>				
cereals	40.0	38.5	39.5	41.0
legumes	5.8	7.5	14.1	10.9
roots, tubers, starchy staples	0.7	0.7	0.6	1.0
vegetables	3.3	2.7	2.4	2.7
fruits	0.0	0.0	0.0	0.0
animal products	10.5	7.2	8.7	16.3
fats, oil seeds, nuts	0.0	0.0	0.2	0.0
miscellaneous	0.0	0.0	0.1	0.0
• total	60.3	56.6	65.6	71.8
<i>Home-produced</i>				
cereals	6.3	5.4	11.2	19.6
legumes	5.8	4.1	11.2	8.2
roots, tubers, starchy staples	0.2	0.1	0.4	0.5
vegetables	2.1	2.0	1.4	1.8
fruits	0.0	0.0	0.0	0.0
animal products	1.6	1.2	2.3	4.6
fats, oil seeds, nuts	0.0	0.0	0.0	0.0
miscellaneous	0.0	0.0	0.0	0.0
• total	16.0	12.8	26.5	34.7

Appendix 27

Mothers: anthropometry and health

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>sample composition</i>				
17-29 yr	30	29	92	21
30-39 yr	13	22	61	11
40-59 yr	9	5	31	6
unknown	-	-	2	0
• total	52	56	186	38
<i>weight</i>				
• N	52	55	185	38
• average (kg)	54.9	53.2	55.6	58.7
• distribution (%)				
<40	0	2	1	0
40-45	6	9	7	3
45-50	19	27	17	8
50-60	48	47	50	53
60+	27	15	25	37
	100	100	100	100
<i>height</i>				
• N	52	56	186	38
• average (cm)	160.5	160.9	161.1	162.8
• distribution (%)				
<145	0	0	1	0
145-150	8	0	5	0
150-155	10	14	10	16
155-160	21	30	29	26
160+	62	55	56	58
	100	100	100	100
<i>weight-for-height</i>				
• N	52	55	185	38
• average	96.9	93.5	97.5	101.5
• s.d.	12.2	10.9	14.0	14.0
• distribution (%)				
<80	4	9	7	3
80-85	14	13	8	5
85-90	12	20	17	11
90-95	23	20	16	21
95-100	21	13	17	11
100+	27	25	36	50
	100	100	100	100
<i>reported illness</i>				
• N	52	56	186	38
• ill during past week (average)	2.5	2.4	3.4	2.7
• distribution (%)				
0 days	54	54	39	39
1-3 days	15	16	15	32
4-6 days	2	4	8	8
7 days	29	27	38	21
	100	100	100	100

Appendix 28

Children: study population

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>all children</i>				
boys	77	80	306	60
girls	71	77	275	58
• total	148	157	581	118
<i>6-23 months</i>				
boys	12	18	58	13
girls	15	13	64	9
• total	27	31	122	22
<i>24-59 months</i>				
boys	33	22	117	23
girls	28	28	97	20
• total	61	50	214	43
<i>60-119 months</i>				
boys	32	40	131	24
girls	28	36	114	29
• total	60	76	245	53

Appendix 29

**Children: weight and height,
by sex and 3-12 months age groups**

A) WEIGHT (kg)						
N	boys average	s.d.	age age (months)	N	girls average	s.d.
16	8.0	1.0	06 - 09	13	6.9	1.2
13	8.3	0.8	09 - 12	21	7.8	1.4
13	8.9	1.3	12 - 15	17	8.7	1.3
19	9.3	1.6	15 - 18	16	8.6	1.5
19	10.2	1	18 - 21	14	9.8	1.9
20	10.2	1.7	21 - 24	18	9.9	1.6
12	9.7	1.1	24 - 27	14	10.4	1.4
16	10.6	1.8	27 - 30	15	11.0	0.9
31	12.8	1.8	30 - 36	23	11.9	1.8
37	13.1	1.8	36 - 42	27	12.8	2.0
31	14.4	2.5	42 - 48	34	14.1	2.0
65	15.2	2.2	48 - 60	55	14.8	2.1
49	16.6	2.2	60 - 72	43	15.9	2.4
54	18.7	2.8	72 - 84	41	17.9	2.6
45	20.4	2.9	84 - 96	42	19.5	2.8
39	22.3	2.8	96 - 108	38	21.9	3.1
32	24.7	3.4	108 - 120	38	24.7	3.4
B) HEIGHT (cm)						
N	boys average	s.d.	age months	N	girls average	s.d.
15	69.5	2.9	06 - 09	10	65.8	3.7
13	69.2	3.3	09 - 12	20	69.9	5.5
13	74.0	2.9	12 - 15	17	73.7	5.3
19	73.9	4.3	15 - 18	15	74.8	4.3
18	79.6	3.7	18 - 21	14	79.3	5.3
20	79.9	4.8	21 - 24	17	78.9	5.1
12	78.2	3.8	24 - 27	14	80.8	3.8
16	80.5	5.7	27 - 30	15	84.1	4.1
30	90.8	5.1	30 - 36	23	88.9	8.7
36	90.8	5.1	36 - 42	28	90.7	7.9
31	95.7	7.7	42 - 48	34	95.9	7.3
65	100.4	7.2	48 - 60	55	99.9	7.0
48	105.9	6.6	60 - 72	43	104.6	6.4
54	113.5	7.4	72 - 84	41	114	7.5
45	117.8	6.7	84 - 96	41	116.5	7.3
39	122.2	5.8	96 - 108	37	122.3	5.0
32	127.3	6.3	108 - 120	38	127.7	8.5

Appendix 30

Children: illness

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>6-23 months</i>				
• N	27	31	122	22
• nr. of days ill (average)	3.4	2.9	2.8	2.5
• distribution (%)				
0 days	33	52	48	59
1-3 days	15	6	13	5
4-6 days	26	10	9	5
7 days	26	32	30	32
	100	100	100	100
<i>24-59 months</i>				
• N	61	50	214	43
• nr. of days ill (average)	2.3	1.9	2.6	2.1
• distribution (%)				
0 days	53	64	51	53
1-3 days	15	12	15	21
4-6 days	15	4	8	5
7 days	18	20	26	21
	100	100	100	100
<i>60-119 months</i>				
• N	60	76	245	53
• nr. of days ill (average)	1.6	2.0	2.0	2.7
• distribution (%)				
0 days	62	59	58	49
1-3 days	17	15	16	17
4-6 days	13	8	6	4
7 days	8	18	20	30
	100	100	100	100

Appendix 31

Children: weight-for-height

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>6-23 months</i>				
• N	26	27	116	22
• average	91.8	95.0	94.7	101.2
• s.d.	8.8	9.2	10.7	9.0
• distribution (%)				
<80	12	4	4	-
80-84	8	11	13	-
85-89	19	19	17	-
90-94	27	11	21	32
95-99	19	26	18	23
100+	15	30	27	45
	100	100	100	100
<i>24-59 months</i>				
• N	59	48	210	41
• average	95.8	95.6	96.2	96.9
• s.d.	10.8	7.9	7.7	7.3
• distribution (%)				
<80	10	4	1	-
80-84	-	6	3	2
85-89	14	15	18	17
90-94	24	21	25	20
95-99	19	23	21	29
100+	34	31	31	32
	100	100	100	100
<i>60-119 months</i>				
• N	58	71	238	51
• average	94.7	95.8	94.4	95.7
• s.d.	7.9	8.4	6.9	6.5
• distribution (%)				
<80	3	3	2	2
80-84	5	6	6	4
85-89	22	13	15	10
90-94	19	23	30	33
95-99	19	32	28	25
100+	31	24	19	25
	100	100	100	100
<i>all children</i>				
• N	143	146	564	114
• average	94.6	95.6	95.1	97.3
• s.d.	9.4	8.3	8.1	7.8

Appendix 32

Children: height-for-age

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>6-23 months</i>				
• N	26	27	116	22
• average	97.4	93.2	94.9	93.9
• s.d.	5.4	5.5	6.4	4.6
• distribution (%)				
<85	-	7	4	-
85-89	8	22	20	23
90-94	35	30	31	36
95-99	27	30	29	32
100+	31	11	16	9
	100	100	100	100
<i>24-59 months</i>				
• N	59	48	211	41
• average	96.9	92.9	94.0	95.4
• s.d.	6.8	6.2	6.6	6.5
• distribution (%)				
<85	-	6	9	2
85-89	12	23	17	12
90-94	29	38	31	44
95-99	36	25	29	27
100+	24	8	14	15
	100	100	100	100
<i>60-119 months</i>				
• N	58	71	238	51
• average	95.7	93.8	94.3	96.3
• s.d.	5.9	4.6	5.6	5.2
• distribution (%)				
<85	3	4	3	-
85-89	12	10	17	4
90-94	34	49	36	29
95-99	26	32	31	53
100+	24	4	13	14
	100	100	100	100
<i>all children</i>				
• N	143	146	565	114
• average	96.5	93.4	94.3	95.5
• s.d.	6.2	5.3	6.1	4.8

Appendix 33

Children: weight-for-age

	permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>6-23 months</i>				
• N	26	31	119	22
• average	87.7	83.6	86.0	89.3
• s.d.	11.6	12.3	14.7	10.2
• distribution (%)				
<60	4	6	4	-
60-69	-	6	8	-
70-79	15	16	23	27
80-89	31	39	33	23
90-99	38	29	13	32
100+	12	3	19	18
	100	100	100	100
<i>24-59 months</i>				
• N	59	48	211	41
• average	90.5	84.2	86.4	89.4
• s.d.	14.0	10.1	12.0	13.6
• distribution (%)				
<60	-	-	1	-
60-69	7	8	7	2
70-79	17	25	21	27
80-89	22	35	33	32
90-99	37	27	27	20
100+	17	4	10	20
	100	100	100	100
<i>60-119 months</i>				
• N	58	71	239	52
• average	86.4	83.7	83.7	88.7
• s.d.	11.8	10.8	11.7	11.2
• distribution (%)				
<60	-	1	3	-
60-69	12	7	8	-
70-79	19	21	27	17
80-89	33	45	34	48
90-99	21	21	21	13
100+	16	4	8	21
	100	100	100	100
<i>all children</i>				
• N	143	150	569	115
• average	88.3	83.9	85.2	89.0
• s.d.	12.8	10.8	12.5	11.3

Appendix 34

Children: h-a * w-h classification

(% children in respective condition)

			permanent labourers	resident casuals	non-resident casuals	non- labourers
<i>6-23 months</i>						
• N			26	31	119	22
	h-a	w-h				
malnourished	<90	<85	4	7	7	-
wasted	>=90	<85	15	7	10	-
stunted	<90	>=85	4	22	17	2-
normal	>=90	>=85	77	63	66	23
			100	100	100	77
<i>24-59 months</i>						
• N			59	48	211	41
	h-a	w-h				
malnourished	<90	<85	2	4	2	-
wasted	>=90	<85	8	6	3	2
stunted	<90	>=85	10	25	23	15
normal	>=90	>=85	80	65	42	83
			100	100	100	100
<i>60-119 months</i>						
• N			58	71	239	51
	h-a	w-h				
malnourished	<90	<85	2	3	3	-
wasted	>=90	<85	7	6	5	6
stunted	<90	>=85	14	11	17	4
normal	>=90	>=85	78	80	74	90
			100	100	100	100

Appendix 35

Notes on calculations

A. CONSUMER UNITS

For the analysis of survey findings at household level, it is important to standardize household size. The most common way is a straight count of the number of household members, which means that each member receives an equal weight. For certain (e.g. demographic) purposes, this is quite appropriate. For other purposes, however, a weighted summation is often needed because the requirements of household members differ from each other. For example, the food consumption of a child is less than that of an adult, but this is also true for other needs: shelter, clothing, transport.

An approximation of the relative needs is offered by a physiological weighting, namely according to the nutritional requirements of individual household members. This incorporates various biological characteristics: age, sex, physiological status and physical activity level and it offers a fair approximation of overall requirements, also because food consumption forms a large part of overall consumption.

The weights obtained in this way are expressed as "consumer units". One consumer unit (cu) stands for the consumption equivalent (here: in terms of required energy) of a nominal adult male. The reference adult male of 20-29 years in Trans Nzoia District is estimated to need 2960 kcal per day. All other individuals are expressed as a ratio of this unit (adult male equivalents) on the basis of their estimated nutritional energy requirements. For the calculation of these requirements, international recommendations were used (WHO/FAO/UNU 1985). Further assumptions that were made in order to fit the reference standards to the circumstances in Coast Province concerned body size, pregnancy and lactation, activity patterns and disease. For instance, pregnant women have received 0.1 cu extra because of the extra energy they require. The energy requirements of the various age and sex groups, expressed in terms of consumer units, are as follows:

age	male	female	age	male	female	age	male	female
0yr	0.3cu	0.3cu	8-10yr	0.7cu	0.7cu	30-39yr	1.0cu	0.8cu
1yr	0.4cu	0.4cu	11-16yr	0.8cu	0.7cu	40-59yr	0.9cu	0.7cu
2-4yr	0.5cu	0.5cu	17-19yr	0.9cu	0.7cu	60yr+	0.7cu	0.6cu
5-7yr	0.6cu	0.6cu	20-29yr	1.0cu	0.8cu			

B. RESIDENCY

Residency type of household members

If a household member was not a full-time resident, the frequency of visits was used to determine the residency type of a person. Those who came home several times a week were counted as full-time household members. Those who came home weekly, monthly or between terms were defined as part-time household members. Those who came several times a year, yearly or less frequently were defined as non-residents.

Calculation of consumer units of household members residing elsewhere

Because full-time residents consume a larger part of the household food supply than part-time and non-residents, adaptations have been made in order to get a clear picture of the actual number of consumer units within the households. Several categories of household members can be distinguished (see questionnaire in Appendix 36). Based on the amount of time they spent at home, calculations are made whereby partly-present household members are calculated as a ratio of full-time household members. Schooling children have been given higher ratios because they are expected to spend more time at home and to be more dependent on the household than adults staying elsewhere.

Non-residential household members,
Regularly absent household members,
and Commuters:

<i>Frequency of visits:</i>	<i>Ratio</i>
several times a year	0.10
between terms	0.25
every month	0.15
every week	0.35
several times a week	0.45

Schooling children:

<i>Frequency of visits:</i>	<i>Ratio</i>
several times a year	0.10
between terms	0.25
every month	0.30
every week	0.45
several times a week	0.55

Visitors have been deleted

Income calculation of household members living elsewhere

Household members not permanently present in the household will not only consume less than full-timers but it is also expected that a smaller share of their income will be spent on household needs. Because heads of households are expected to devote a larger share of their income to the household compared to other household members residing elsewhere, different adaptations concerning the income earned have been made.

Regularly absent household members:

Head of the household

<i>Frequency of visits:</i>	<i>Ratio</i>
several times a year	-
between terms	0.40
every month	-
every week	-
several times a week	0.80

Other household members

<i>Frequency of visits:</i>	<i>Ratio</i>
several times a year	0.10
between terms	-
every month	-
every week	0.40
several times a week	0.40

Non-residential household members:

Head of the household

<i>Frequency of visits:</i>	<i>Ratio</i>
once a year	0.30
several times a year	0.30
between terms	0.40
every month	0.40
every week	0.75
several times a week	-

Other household members

<i>Frequency of visits:</i>	<i>Ratio</i>
once a year	0.10
several times a year	0.10
between terms	0.30
every month	0.25
every week	0.40
several times a week	0.40

Commuters:Head of the household

<i>Frequency of visits:</i>	<i>Ratio</i>
once a year	-
several times a year	-
between terms	-
every month	-
every week	0.85
several times a week	0.85

Other household members

<i>Frequency of visits:</i>	<i>Ratio</i>
once a year	-
several times a year	-
between terms	-
every month	-
every week	0.75
several times a week	0.75

The income of schooling children has been counted as 100% because they presumably undertake activities during the school holidays and all income is given to their parents. When the income earned is more than KSh.1000 the calculations made above are used. When the income earned is less than KSh.1000, the incomes as calculated above are multiplied by 80%.

C. FARM LABOUR EQUIVALENTS

In order to calculate the available farm labour within the households, only persons who said they worked on the household's plot have been taken into account. Each adult aged 17-60 years who was not employed full-time, was counted as 1.0 farm labour equivalent (f.l.e.). Those who were employed full-time were counted as 0.25 f.l.e., while those who were employed part-time were counted as 0.50 f.l.e. Adults who were schooling were also counted as 0.50 f.l.e.

Children who were schooling have been counted as 0.25 f.l.e., while children who did not go to school have been counted as 0.50 f.l.e. Persons older than 60 were counted as 0.50 f.l.e.

D. VALUE OF HOME-CONSUMED FOOD PRODUCTION

In order to assess the income in kind from the households' farming activities for home consumption, the following calculations were made. Data about the last harvest of maize, beans, irish potatoes, sweet potatoes, bananas, and some less common food crops like sorghum, millet, peas, *njahe* and *sukuma wiki* were collected. This information was available in different quantities: 90 kg bags, *debes* (about a sixth of a 90 kg bag) and *ngoro ngoros* (about one-eighth of a debe) for maize, beans, irish potatoes, sweet potatoes, millet, sorghum, and peas; bundles for sukuma wiki; and bunches for bananas. Furthermore, information was collected about how many 90 kg bags, debes, ngoro ngoros or bunches had been sold. The sold amounts of food crops were subtracted from the harvested amount. The difference was considered to be the income in kind from farming. Because more food crops were bought than sold, it was decided to use the prices of bought food crops for calculating an average price for home-consumed food production. The average prices of a 90 kg bag were used as the basis for the average prices for debes by dividing the average price of a 90 kg bag by 5.8, and for ngoro ngoros by dividing the average price of a 90 kg bag by 45. Because bananas are always measured in bunches, the average buying price as mentioned by all respondents was used,

i.e. KSh.30 per bunch. The prices used for the estimation of the monetary value of home-consumed production of food crops are as follows:

	<i>90 kg bag</i>	<i>debe</i>	<i>ngoro ngoro</i>
maize	250	43	5.6
beans	400	69	8.9
irish potatoes	150	26	3.3
sweet potatoes	150	26	3.3
millet	500	86	11.1
sorghum	500	86	11.1
peas, njahe	110	19	2.4
sukuma wiki	85	1 (bundle)	-

E. VALUE OF LIVESTOCK AND MILK PRODUCTION

The income in kind received from livestock consists of the value added during the last year (off-take rate) and the production of milk. In order to calculate the off-take rate, prices of cattle were needed. Only prices of bulls and ungraded cows were available. The value of a grade cow was estimated to be 2.5 times the value of an ungraded cow, and the value of a sheep one-fifth and of a goat one-seventh of that of an ungraded cow. Thus, the following prices (KSh.) were obtained:

grade cow	3750	grade bull	2000	sheep	300
ungraded cow	1500	ungraded bull	2000	goat	215

Data collected during the household survey showed that the death rate among grade and ungraded cows was very high. The number of calves was not enough to make up for the death of cows. Therefore, no off-take rate was calculated for cows. Taking into account the death rate among bulls and the number of calves in the sample, the off-take rate of a grade bull was estimated at 13% and of an ungraded bull at 20%. The off-take rate of goats is 30%, while that of sheep is only 10% due to a high death rate.

The value of the milk production was calculated as follows. The average consumer price of one litre of milk in 1989 was KSh.5. According to a Dairy Development Project Report (MOLD 1989) grade cows, with a very intensive way of farming, gave six litres of milk a day. Because of the extensive way of dairy farming, it was assumed that grade cows of households in the sample gave about half that amount, i.e. three litres a day. However, cows do not produce the same amount of milk during the wet and dry season. It was assumed that during six months an average cow gave three litres a day and during the other six months two litres, resulting in a total production value per year of KSh.4,565 per grade cow. The production of local cows was estimated at an average of about one litre per day, adding up to an income of KSh.1,825 a year.

Based on all calculations described above, the income in kind from cattle is:

grade cow	4565	ungraded bull	400
ungraded cow	1825	sheep	30
grade bull	260	goat	65

E. AVERAGE RURAL HOUSEHOLD MONTHLY CONSUMPTION EXPENDITURE

The monthly expenditures are derived from the data of the Rural Household Budget Survey 1981/82 (see CBS 1988). The expenditures cover all expenses, including the value of home-produced food. Monthly expenditures are presented per household size class, so for the four study groups those expenditure levels were chosen that were according to the average household sizes (measured in number of persons) of the groups. In order to get the expenditures in July 1989 prices, the expenditure levels of 1981/82 were multiplied by 1.9, being the ratio between the lower income index of consumer prices in Nairobi in July 1989 and that of 1981/82 (see CBS 1990 and CBS 1986). Thus, the method of calculation was as follows:

	permanent labourers	casuals on the farm	casuals out- side the farm	non- labourers
• household size class	6-7	6-7	8-9	8-9
• monthly expenditure, 1981/82 prices				
- on food	357	357	442	442
- on all items	541	541	699	699
• monthly expenditure, July 1989 prices				
- on food	678	678	840	840
- on all items	1028	1028	1328	1328

Appendix 36

Questionnaire

FOOD & NUTRITION STUDIES PROGRAMME (FNSP 8)

Trans Nzoia Farm Survey, 1989

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Name of Farm		farm nr		Permanent ☐		div ☐		loc ☐		subhsehd loc ☐		nr ☐	
				Casual ☐									
Head of household				origin: District		code		nr of yrs		reason:			
name										1: to buy a farm			
				origin: Location		code		reason		2: to find work			
								☐		3: to join fam.			
										9: other (spec)			
Compound characteristics										unit:			
nr of houses	nr of rooms	store	nr of firepl	latrine	main house	rent	unit		1: Ksh per week				
☐	☐	☐	☐	☐	☐				2: Ksh per month				
								3: Ksh per year					
								9: other (spec)					
								main house:					
								1: self-built					
								Bought					
								2: from farm					
								3: from labourer					
								Rented					
								4: from farm					
								5: from labourer					
Water use		drinking src dist		domestic src dist		livestock src dist		distance:		location:			
wet season		☐	☐	☐	☐	☐	☐	1: 0-10 min		1: own farm			
dry season		☐	☐	☐	☐	☐	☐	2: 11-30 min		2: empl. farm			
		☐	☐	☐	☐	☐	☐	3: 31-60 min		3: other farm			
		☐	☐	☐	☐	☐	☐	4: over 1 hr		4: roadside			
		☐	☐	☐	☐	☐	☐			9: other(spec)			
Fuel use		collection loc		fuelwood hours		purchase bndl/wk		quant unit		latrine:			
wet season		☐	☐	☐	☐	☐	☐	☐	☐	1: shared			
dry season		☐	☐	☐	☐	☐	☐	☐	☐	2: indiv.			
		☐	☐	☐	☐	☐	☐	☐	☐	3: none			
Comments													

Legend

src = source, dist = distance, quant= quantity, bndl/wk = bundles per week, loc = location

		da mo yr		name assistant/supervisor		nr of pages	
Household interv.	☐	☐	☐			Form 1 ☐	
check	☐	☐	☐			Form 2 ☐	
Coding	☐	☐	☐			Form 3 ☐	
check	☐	☐	☐			Form 4 ☐	
Data Entry	☐	☐	☐			Form 5 ☐	
check	☐	☐	☐			Form 6 ☐	
	☐	☐	☐			Form 7 ☐	
	☐	☐	☐			Form 8 ☐	
	☐	☐	☐			Form 9 ☐	
	☐	☐	☐			Form10 ☐	

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[illegible]

- 1: agricultural casual labour
- 2: agricultural permanent labour
- 3: non-agricultural casual labour
- 4: non-agricultural permanent labour
- 5: trading
- 6: self-employed
- 7: food preparation
- 8: domestic labour
- 9: employed by household

1: (semi)permanent
2: retired
3: neither

1: day
2: week 4: half a year
3: month 5: year

Comments

--

recall of last harvest, sales of crops, and expenditures on staple foods or crops

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Hsehold nr

Page nr

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[illegible]

Dist = distance, pur = purpose, freq = frequency

Comments

--

- 1: only sales
- 2: mainly sales
- 3: both equal
- 4: mainly home
- 5: only home

- 1: usually
- 2: seldom
- 3: never
- 4: after crop failure

1: 0-10 min
2: 11-30 min
3: 31-60 min
4: over 1 hr

1: river bank
2: steep slope
3: hill side
4: undulating
9: other(spec)

1: 90kg bag
2: 50kg bag
3: debe
4: kg weight
5: number
6: bunches
7: heaps
8: 2kg tin
9: 1kg tin
10: .5kg tin
11: .25kg tin
12: bundle
13: loaf
14: packet
99: other(specify)

- 1: daily
- 2: every other day
- 3: twice a week
- 4: weekly
- 5: twice a month
- 6: monthly
- 7: every other month
- 8: every three months
- 9: every half year
- 10: yearly

FORM 4: FARMING - 2

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Domestic animals, constraints of food production, sales of horticultural crops

Household nr

Page nr

type:	type	caretaker	nr	past 12 months		
				sold	bght	died
1: grade cow						
2: grade bull						
3: grade calves						
4: ungraded cow						
5: ungraded bull						
6: ungraded calves						
7: ox						
8: donkey						
9: goat (prod. female)						
10: sheep (prod. female)						
11: chicken (prod. female)						
12: duck (prod. female)						
13: goose (prod. female)						
14: rabbit (prod. female)						
15: dove						
99: other (specify)						

caretaker:
 1: household, on plot
 2: household, elsewhere in Location
 3: household, elsewhere
 4: others, in Location
 5: others, elsewhere

Legend

bght = bought, prod = productive

Are you able to grow enough food to feed your family?

yes, always
 yes, usually
 sometimes
 not enough
 completely insufficient
 does not farm

In case sometimes or less than that, or in case not farming:

Why don't you cultivate (more) crops?

What are the constraints?

Tick appropriate reasons

no land available
 no labour available
 poor soil
 need to sell crops
 not allowed to grow crops
 other, specify

If horticultural crops grown and sold: to whom do you sell, and where?

comments

FORM 5: ANTHROPOMETRY - 1

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Hsehold nr Page nr

anthropometric measurements of mother and her children

deceased	date				nr	height	weight	nr	dis	co	fe	di	vo	living children	live-born children	preg
☐	name mother															
☐	name father															

name child	nr	birthdate			age		cr	br	height	weight	mac	present health			disease past week				
		da	mo	yr	yr	mo						oe	ma	ap	co	fe	di	vo	na

Legend:

da = day, mo = month, yr =year, cr = certificate, br = breastfeeding, mac = mid-upper-arm circumference, preg = pregnant,
oe = oedema, ma = marasmic, ap = apathic, co = coughing, fe = fever, di = diarrhoea, vo = vomiting, na = no appetite,
dis = disease

certificate:

- 1: birth certificate
- 2: clinic card
- 3: written note
- 4: easy recollection
- 5: doubtful

breastfeeding:

- 1: breastfed only
- 2: breastfed + liquids
- 3: breastfed + solids
- 4: almost weaned
- 5: fully weaned
- 6: never breastfed

comments:

diseases:

- 1: cold
- 2: pneumonia
- 3: whooping cough
- 4: dysentery
- 5: cholera
- 6: measles
- 7: malaria
- 8: bilharzia
- 99: other(spec)

observation of dishes prepared

time		
starting		
stopping		
total cooking time		

11

Page nr

density of dish

1: thick/dense/stiff
2: medium
3: watery/thin/soft

consistency of dish

1: liquid
2: solid in liquid
3: solid

source of ingredient:

- 1: home production
- 2: from non-resident
- 3: from relative
- 4: borrowed (neighbour)
- 5: bought from employer
- 6: bought elsewhere

unit:	size:
1: 90kg bag	1: small
2: 50kg bag	2: medium
3: debe	3: big
4: kg weight	4: very big
5: number	
6: bunches	15: stick
7: heaps	16: cm
8: 2kg tin	17: cc
9: 1kg tin	18: grammes
10: .5kg tin	19: table spoon
11: .25kg tin	20: tea spoon
12: bundles	21: beer bottle
13: loafs	22: treetop bottle
14: packet	23: soda bottle
99: other(spec)	24: glass

form page

[illegible]

total		
-------	--	--

Legend:

Srcce = source, price = price per unit in Ksh,
var = variety, %used = percentage of total used for dish.

recall of prepared dishes

Hsehold	nr	Page	nr
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Variable	Number of Comments
dish	1
date	3
name cook	1
density	1
consistency	1

density of dish

- 1: thick/dense/stiff
2: medium
3: watery/thin/soft

consistency of dish

- 1: liquid
2: solid in liquid
3: solid

source of ingredient:

- 1: home production
- 2: from non-resident
- 3: from relative
- 4: borrowed (neighbour)
- 5: bought from employer
- 6: bought elsewhere

unit:	size:
1: 90kg bag	1: small
2: 50kg bag	2: medium
3: debe	3: big
4: kg weight	4: very big

6: bunches	15: stick
7: heaps	16: cm
8: 2kg tin	17: cc
9: 1kg tin	18: grammes
10: .5kg tin	19: tablespoon
11: .25kg tin	20: teaspoon
12: bundles	21: beer bottle
13: loafs	22: treetop bottle
14: packet	23: soda bottle
99: other(spec)	24: glass

form page

[illegible]

Legend:

Src = source, price = price per unit in Ksh,
var = variety, %used = percentage of total used for dish.

FORM 9: INTAKE - 1
food intake of Index children

CONFIDENTIAL

Page nr
Hsehold nr

□

□

nr
pers

pers
nu

Id

4

nr	name child

nr	name child

nr	name child

[illegible][illegible][illegible]**comments**

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FORM 10: COMMENTS

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Hsehold nr Page nr

comments:

References

- Agatsiva, J. (1985),
Land use in Trans Nzoia District.
 Nairobi: Ministry of Planning & National Development, Kenya Rangeland Ecological Monitoring Unit, Technical Report No. 1.
- CBS (1981),
Kenya population census 1979, volume 1.
 Nairobi: Ministry of Planning and Development, Central Bureau of Statistics.
- CBS (1983),
Third rural child nutrition survey.
 Nairobi: Ministry of Finance and Planning, Central Bureau of Statistics.
- CBS (1986),
Statistical Abstract 1986.
 Nairobi: Ministry of Planning and National Development, Central Bureau of Statistics.
- CBS (1988),
Economic Survey 1988.
 Nairobi: Ministry of Planning and National Development, Central Bureau of Statistics.
- CBS (1990),
Statistical Abstract 1990.
 Nairobi: Ministry of Planning and National Development, Central Bureau of Statistics.
- CBS (1991),
Economic Survey 1991.
 Nairobi: Ministry of Planning and National Development, Central Bureau of Statistics.
- FNSP (1988),
Food supply and nutrition among farm labourers in Trans Nzoia: Research Outline.
 Nairobi & Leiden: Ministry of Planning and National Development & African Studies Centre, Food and Nutrition Studies Programme, Report No. 25.
- FNSP (1990),
Food supply and nutrition among farm labourers in Trans Nzoia: Progress Report, January 1990.
 Nairobi & Leiden: Ministry of Planning and National Development & African Studies Centre, Food and Nutrition Studies Programme, Report No. 33.
- Foeken, D. & L. Verstrate (1992),
Labour conditions on large farms in Trans Nzoia District, Kenya.
 Nairobi & Leiden: Ministry of Planning and National Development & African Studies Centre, Food and Nutrition Studies Programme, Report No. 43.
- GOK (1981),
Sessional Paper no. 4 on National Food Policy.
 Nairobi: Government of Kenya.
- GOK (1987),
District Focus for Rural Development (revised edition).
 Nairobi: Government of Kenya, Office of the President.

- Greer, J. & E. Thorbecke (1984),
Pattern of food consumption and poverty in Kenya and effects of food prices.
 Cornell University (unpublished paper).
- Jaetzold, R. & H. Schmidt (1983),
Farm management handbook of Kenya, Volume II, Part B: Central Kenya.
 Nairobi: Ministry of Agriculture.
- Jelliffe, D.B. (1966),
Assessment of nutritional status in the community.
 Geneva: World Health Organization.
- Kliest, T. (1985),
Regional and seasonal food problems in Kenya.
 Nairobi & Leiden: Ministry of Planning and National Development & African Studies Centre,
 Food and Nutrition Studies Programme, Report No. 10.
- Mbithi, P. & I.C. Barnes (1975),
Spontaneous settlement problems in Kenya.
 Nairobi: East African Literature Bureau.
- McCarthy, F. & W. Mwangi (1979),
Kenya agriculture: towards 2000.
 Nairobi: Ministry of Economic Planning and Community Affairs.
- MEPD (1980),
Trans Nzoia: District Development Plan 1979-83.
 Nairobi: Ministry of Economic Planning and Development.
- MFP (1984),
Trans Nzoia: District Development Plan 1984-88.
 Nairobi: Ministry of Finance and Planning.
- MOA (1990),
Annual Report 1989, Trans Nzoia District.
 Kitale: Ministry of Agriculture.
- MOLD (1989),
*National Dairy Development Project. Report recording farms period
 July 1985-June 1986 and July 1986-June 1987, Part 1.*
 Nairobi: Ministry of Livestock Development.
- MOLD (1991),
Annual Report 1990, Trans Nzoia District.
 Kitale: Ministry of Livestock Development.
- MPND (1989),
Trans Nzoia: District Development Plan 1989-93.
 Nairobi: Ministry of Planning and National Development.
- Mwangi, M. (1981),
 "Implications of "Agriculture 2000" to present planning."
 In S.E. Migot-Adholla & J.A. Nkinyangi (eds), *Proceedings of a workshop on food and nutrition
 planning in Kenya*, pp. 98-107. Nairobi: Ministry of Economic Planning and Development.
- ROK (1976),
Trans Nzoia: District Development Plan 1974-78.
 Nairobi: Republic of Kenya.

- Schafgans (1988),
Rurale ontwikkeling en agrarische kolonisatie in het Trans Nzoia District, Kenia
 ["Rural development and agrarian colonisation in Trans Nzoia District, Kenya"].
 Utrecht: University of Utrecht, Department of Geography, M.A.-thesis.
- Senga, W., R. Faruquee & B. Ateng (1981),
Population Growth and Agricultural Development in Kenya.
 Nairobi: Institute for Development Studies, Occasional Paper no. 40.
- Shah, M. & H. Frohberg (1980),
Food consumption pattern: rural and urban Kenya.
 Laxenburg: International Institute for Applied Systems Analysis, Working Paper no. 80-14.
- Tellegen, N. & D. Foeken (1992),
Farm labourers in Trans Nzoia District, Kenya. Proceedings of a dissemination seminar held in Kitale, 23-24 November 1992. Nairobi & Leiden: Ministry of Planning and National Development & African Studies Centre, Food and Nutrition Studies Programme, Report No. 46
- Tellegen, N., L. Verstrate & D. Foeken (1992),
Income generation of farm labourers in Trans Nzoia District, Kenya: the importance of rural employment and social networks. Nairobi & Leiden: Ministry of Planning and National Development & African Studies Centre, Food and Nutrition Studies Programme, Report No. 45.
- WHO (1983),
Measuring change in nutritional status: guidelines for assessing the nutritional impact of supplementary feeding programmes for vulnerable groups.
 Geneva: World Health Organization.
- WHO/FAO/UNU (1985),
Energy and protein requirements.
 Geneva: World Health Organization, Technical Report 724.

FNSP research reports

4. Kliet, T. (1984), **The Agricultural Sector of the Kano Plain.**
10. Kliet, T. (1985), **Regional and Seasonal Food Problems in Kenya.**
11. Meilink, H. (1985), **Agricultural Pricing Policy in Kenya: Scope and Impact.**
14. Niemeijer, R., M. Geuns, T. Kliet, V. Ogonda & J. Hoorweg (1985), **Nutritional Aspects of Rice Cultivation in Nyanza Province, Kenya.**
21. Meilink, H. (1987), **Food Consumption and Food Prices in Kenya: A Review.**
22. Peters, C. & R. Niemeijer (1987), **Protein-Energy Malnutrition and the Home Environment: a study among children in Coast Province, Kenya.**
23. Ruigu, G. M. (1987), **Large-Scale Irrigation Development in Kenya: Past Performance and Future Prospects.**
27. Hoorweg, J., T. Kliet & R. Niemeijer (1988), **Seasonality in the Coastal Lowlands of Kenya, Part 1: Research Objectives and Study Design.**
28. Foeken, D. & J. Hoorweg (1988), **Seasonality in the Coastal Lowlands of Kenya, Part 2: Introduction to Seasonality.**
29. Noij, F. & R. Niemeijer (1988), **Resident tenants at the Ahero Irrigation Scheme: household economics and nutrition.**
30. Oosten, C. van (1989), **Farming Systems and Food Security in Kwale District, Kenya.**
32. Foeken, D., P. Leegwater, R. Niemeijer, W. Veerman & J. Hoorweg (1989), **Seasonality in the Coastal Lowlands of Kenya, Part 3: Socio-economic profile.**
35. Leegwater, P., J. Ngolo & J. Hoorweg (1991), **Dairy Development and Nutrition in Kilifi District, Kenya.**
36. J. Hoorweg, R. Niemeijer, D. Foeken, W. Okello & W. Veerman (1991), **Economic and Nutritional Conditions at Settlement Schemes in Coast Province.**
37. Maas, M. (1991), **Women's Social and Economic Projects; Experiences from Coast Province.**
38. Niemeijer, R., D. Foeken & W. Klaver (1991), **Seasonality in the Coastal Lowlands of Kenya, Part 4/5: Food Consumption and Anthropometry.**
40. Foeken, D. & J. Hoorweg (1991), eds., **Socio-economic and nutritional studies in Coast Province: summaries and recommendations. Proceedings of a dissemination seminar at Diani, 28-30th November 1990.**
41. Dijkstra, T. & T. Magori (1992), **Horticultural production and marketing in Kenya, Part 1: Introduction, research objectives and methodology.**
43. Foeken, D. & L. Verstrate (1992), **Labour conditions on large farms in Trans Nzoia District, Kenya.**
44. Foeken, D. & N. Tellegen (1992), **Household resources and nutrition of farm labourers in Trans Nzoia District, Kenya.**
45. Tellegen, N., L. Verstrate & D. Foeken (1992), **Income generation of farm labourers in Trans Nzoia District, Kenya: rural employment and social networks.**
46. Tellegen, N. & D. Foeken, eds. (1992), **Farm labourers in Trans Nzoia District, Kenya. Proceedings of a dissemination seminar at Kitale, 23-24th November 1992.**

