Population, Poverty, and Underdevelopment in the Southern Sudan

by WILLIAM J. HOUSE*

The Christian and animist population of the Southern Sudan is largely composed of black Africans, estimated to number 5.3 million in 1983, as against the 15.3 million, predominantly Arabic and Muslim, who inhabit the Northern Sudan.1 The economy of the Southern Sudan, comprised of the three semi-autonomous regions of Bahr El Ghazal, Upper Nile, and Equatoria, remains one of the least developed in sub-Saharan Africa. The great majority of the population is engaged in subsistence agriculture, although some limited cash income is generated from the sale of surplus crops, and nomadic pastoralism is also widely practised. Only about three per cent of the inhabitants live in the three regional capitals of Wau, Malakal, and Juba, and they have to depend heavily for work in the public sector and small-scale informal activities.

The meagre social and economic infrastructure of this vast area has been depleted by 17 years of civil war between the North and the South, and although temporarily halted in 1972, the hostilities were reactivated in 1983 and continue to the present. These have led to the widespread displacement of large numbers of the population to the Northern Sudan and Ethiopia, severe famine, malnutrition and death from starvation, and a closing down of almost all development projects. The concern of this article, however, is with the socio-economic and demographic situation in the Southern Region in the period leading up to the second phase of the civil war in 1983. When peace eventually returns, the process of reconstruction will be long and arduous, and will require enormous additional resources which must necessarily come

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largely from the international community. Longer-term progress in
development can then be measured against the ‘normal’ peacetime
conditions which are portrayed in the following pages.

As documented below, the vast majority of those living in both rural
and urban areas do not have access to the barest minimum of basic
goods and essential services. The underlying causes include the grossly
underdeveloped state of the economy, the dilapidated infrastructure,
and the poor quality of the stock of human resources. The
overwhelming dependence on subsistence agriculture means that the
depressed level of farming incomes does not allow much scope for the
purchase of privately consumed goods and services. Nor are regional
government revenues sufficient to provide many of the essential public
goods associated with the sectors of health, education, transport, and
social services.

Agricultural output and trade in specialised production in rural
areas are severely bound by seasonal family-labour constraints, and by
limited marketing possibilities due to poor transport and communi-
cations. Poverty in the rural economy restricts diversity of
employment opportunities in non-farm activities throughout the
region. Other related reasons for the low level of production include
debilitative disease, inadequate diet, particularly at the busiest time of
the farming calendar, climate, and the sexual division of labour, which
gives rise to a conflict between certain agricultural tasks and domestic
chores.

Scattered pieces of evidence indicate the existence of a high total
fertility rate of at least six births.\(^1\) Meanwhile, infant mortality has been
variously estimated for different parts of the region at between 100 and
250 per 1,000 live births. Furthermore, significant numbers of children
are at risk of malnutrition, the severity of which depends on the time
of the year. Some \textit{ad hoc} surveys have found at least one-third of the
under-5 age group to be stunted and/or wasted.\(^2\) The poor nutritional
status of children is attributable to delays in the introduction of solid
foods, and reliance solely on breast milk well beyond the first birthday;

\(^1\) The total fertility rate may be interpreted as the number of births a woman would have in
her reproductive life if she exactly paralleled the current fertility of women in her own and other
age groups. See William J. House, 'Population, Poverty and Deprivation in Southern Sudan: a
1986, as well as William J. House and Kevin D. Phillips-Howard, 'Population and Poverty in
and 'Socio-Economic Differentiation Among African Peasants: evidence from Acholi, Southern
Sudan', in \textit{Journal of International Development} (Manchester), forthcoming.

\(^2\) K. Balachandra Kurup, \textit{An Appraisal of Nutrition and Other Related Survey Activities in the Southern
Sudan} (Unicef, Khartoum, 1984).
the eating of only one meal per day interspersed with light snacks, in conformity with the eating habits of adults; repeated infections causing fever, diarrhoea, vomiting, often resulting from the extraction of canine teeth in the belief that this would be a remedy for minor ailments; and the widespread existence of taboos about food, including its absence during sickness, and the ban on eating some meats.

Little reliable data are collected on health deficiencies, and those major illnesses that are reported, such as malaria, gastro-enteritis, tuberculosis, and measles, result from unsatisfactory environmental and sanitary conditions. On the other hand, regional public expenditures in the underfunded health sector have been traditionally committed to curative medicine, and to the maintenance and operation of facilities and services which tend to treat the endemo-epidemic diseases rather than to eradicate them at their source. The overall ratios of doctors to population, and maternal child-health workers to mothers and children, are extremely low, with most qualified staff being disproportionately found in the main urban centres.

Given the paucity of medical personnel, the lack of drugs and other equipment, and the inaccessibility of the population to the poor quality facilities that exist, it can only be concluded that the great majority of the inhabitants do not have their primary basic requirements fulfilled. As a consequence, life expectancy at birth has been estimated to be only 36 years in the Southern Sudan.¹

By the mid-1970s the overall primary-school enrolment rate of those aged 7–12 was only 22 per cent, and although the rate for Equatoria had risen marginally a decade later to 45 per cent, it had by then fallen to only 6 per cent in Bahr El Ghazal.² The limited expansion in this key sector favoured the urban-based secondary level, which has contributed to increasing rural-urban migration. Even more depressing than the general quantitative picture is the poor qualitative state of education throughout the Southern Sudan. The story of neglect and under-development of the school system is widespread, as reflected in the bad condition of many buildings, the lack of books and other teaching materials, the high pupil-teacher ratios, and the low proportion of trained staff, amounting to only 47 per cent of primary teachers in Equatoria, the most advanced province in the region.³

Given the current and prospective population dynamics, in which success in lowering the high level of infant mortality is not likely to have much immediate impact on the prevailing high fertility, the population growth is expected to be fairly rapid over the subsequent two decades. This will have adverse consequences for adults needing to support many child dependents in their households, and raise the claims placed on output from subsistence farmers. Even greater demands will be placed on the education and health sectors, although their services are already grossly inadequate. Increasing urbanisation will create even more severe strains on the existing facilities in the towns. Population pressures on good land in and around the main cities and larger villages are already being felt, leading to the likelihood of ecological damage and raising the cost of firewood and charcoal, the principal sources of cooking fuel.

POVERTY AND DEPRIVATION: THE EVIDENCE

Absolute poverty is often seen as a condition of failure to meet the barest essentials of physical existence, which means being unable either to produce sufficient food or to have remunerative work in order to purchase enough for oneself and one’s family – in other words, it is almost entirely a measure of inadequate nutrition. However, poverty needs to be defined to include more than a set of minimum physical requirements, and must be expanded to include what has become known as a shortfall in certain 'basic needs'. There can be no doubt that every family ought to have, *inter alia*, adequate food and a balanced diet (obviously a determinant of nutrition), water and sanitation, clothing and housing, and access to public transport, good health, education, productive employment, and income. Some of these services are provided by the public sector for the community at large, while others are privately purchased by individual families. Furthermore, this approach implies the participation of the people in decision-making.

Amartya Sen gives major emphasis to a person’s ‘exchange entitlement’ as a determinant of his poverty status. Given the bundle of things that an individual owns, including labour power and financial

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and other assets, his ability to purchase enough food and other essentials for survival will depend on employment opportunities and the prevailing wages, the exchange rate between his non-labour assets and the goods and services he wishes to buy, the productivity of his labour power and the rate at which this output can be exchanged, the social security benefits, if any, that will be received, including assistance from relatives and friends, and the taxes that must be paid. Exchange entitlements, therefore, determine the household’s power of command over goods and services for its members.

There is no general agreement about whether poverty should be considered as absolute, or relative in nature, as argued, for example, by Gerry Rodgers:

The level at which a poverty line is set is a value judgement. So if by absolute poverty is meant poverty defined by reference only to absolute standards, this is a misconception... there is always a relative component in any definition of poverty, even one in which only capacity for continued existence is considered... There is no universal, absolute definition of poverty, nor can there be any universal poverty line which, once everyone has achieved it, permits us to put a time limit on the elimination of poverty.1

It is important to recognise that the components which define or identify poverty must be distinguished from the factors which generate the phenomenon. Some of the characteristics of poverty might include: (i) amounts of calories and proteins, (ii) life expectancy, (iii) probability of death before a certain age, (iv) inaccessibility of schools, hospitals, health clinics, and doctors, (v) absence of assets, (vi) little or no security from hunger and violence, (vii) lack of social status in the community, and (viii) the spending of a large proportion of household income on food.

The notion of poverty to be adopted, be it Sen’s ‘irreducible core of absolute deprivation’, or that which identifies poverty as inequality between the poorest groups and the rest of the community, must be set in the context of a particular social and economic structure. Therefore, how do we conceptualise poverty and identify groups of poor in the subsistence economy of the Southern Sudan? At the micro-level it is important for policy purposes to analyse those sub-groups of householders within surveyed communities which suffer the greatest relative deprivations, in order to identify their demographic and economic features, and to design anti-poverty and pro-development

measures. They could then become the focus of assistance from the Government, and particularly from aid-agency projects and relief efforts. Given the subsistence and agricultural nature of our study areas, it seems quite uncontroversial to argue that those households falling in the bottom 20–40 per cent of the distribution of income and asset holdings – including land, food production, and access to various social services – are really poor in the absolute sense which Sen conceptualised and favoured. And the greater the covariance between each component of poverty the more unequivocal we can be in our identification of the groups in this category.

The principal determinant of overall real income and welfare is the nature of the subsistence technology, since this circumscribes the level of productivity. In the Southern Sudan, perhaps security against starvation is the most important and least controversial in the vector of poverty, and this will be dependent on the household’s access to land and its own composition, as measured by the relative number of able-bodied, potential labour-force members. Other family assets, including animals, children, housing, and human capital (education and training), which determine earnings opportunities in non-farm occupations, will all contribute to the nature of the household’s security. The sale of surplus food and pure cash crops provide the most immediate source of security, since this income can be used to buy food as and when the need arises. In such a traditional society the network of social obligations, which often necessitate reciprocal transfers of resources, adds to a family’s security. As regards a particular household, its attitude to risk-taking and its access to, and ability and willingness to introduce, farm innovations will help to determine its place in the society’s distribution of income.

Intimately related to each other, and to security in general, are the levels of food consumption, nutrition, and health, the principal components in the poverty vector. They depend on the output resulting from the household’s own direct production efforts, as well as relative prices (exchange entitlements), including remittances from absent household members. Health and nutrition are dependent on consumption and income levels, as well as work loads and access to socially provided medical services and good water supplies.

In the context of such a low-growth, almost stagnating economy as that of the Southern Sudan, let us now examine indicators at the

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macro-level that show the extent to which peasant smallholders and urban dwellers are able to satisfy their basic subsistence requirements. All of this evidence comes from secondary sources drawn from small-scale sample surveys and case-studies. The reliability and bias in much of the data remain unknown, and since they were collected from various sources over the last ten years or so, no attempt was made to retain consistency in questionnaire design or in measurement techniques. Furthermore, it is not possible to generalise about the extent of poverty and deprivation in the whole of the Southern Sudan, since no effort has ever been made to carry out a socio-economic and demographic survey for the whole region. What follows, therefore, is a brief synopsis of the existing state of knowledge about the extent to which the demand for basic goods and services is satisfied.

1. Food and Nutrition

The nutritional status of children under 5 years of age can serve as a useful indicator of the overall health of all household members. Anthropometric measures usually involve the height, weight, and arm-circumference of children, which are then related to the universally applicable Harvard standards.¹ Perhaps the most widely used measure of nutrition is the weight-for-age index: children falling below 80 but above 60 per cent of the standard are considered to be mildly malnourished, while those below this figure are severely malnourished. Children who are chronically short of food or sick will not grow, and those who are less than 90 per cent of the standard length for age are usually considered to be stunted. The weight-for-length index is age-independent, and hence especially helpful as an indication of nutritional status in societies where mothers do not easily recall the ages of their children. Those who are found to be under 80 per cent of the standard are usually considered to be physically wasting and at risk of malnutrition.

Since Mundri district in the Southern Sudan has limited agricultural potential, it might be expected that the population is at risk and likely to suffer from problems of nutrition. Indeed, severe food shortages are reported to occur in some areas once in every 3 to 5 years when the rains start late, are irregular or end early, or when the harvest is severely affected by disease or pests. The results of a nutrition survey carried out between November 1980 and July 1981 confirm these fears.

of malnutrition, because of the nearly 100 children weighed and measured in each of the five locations, between 26 and 48 per cent were found to be under 80 per cent of the standard weight for age and possibly malnourished. The survey also revealed that a smaller proportion of children were at risk in the rural areas than in the town, where a peak of almost 50 per cent occurred in the hungry months before the initial harvest.¹

Some variation appears in the families claiming to be short of food in Mundri town, ranging from 68 per cent in November/December 1980, probably caused by the late start of the rains, to 30 per cent in June 1981. The range in the rural areas over the same period was 56 and 18 per cent, respectively. The extent of malnutrition is definitely age-related. The lowest proportion of those potentially malnourished are babies under 6 months, and they rely largely on the breast milk of their mothers. After this, however, the proportion at risk rises significantly, to peak at over 40 per cent of all children aged between 12 and 23 months, most of whom continue to rely solely on their mother’s milk because of poor weaning habits. Children who initially refused solid foods were often not persevered with by their parents. Between 22 and 27 per cent of the children in Mundri were under 90 per cent of the standard length for age, and stunting therefore appears as a problem. Ten per cent of the children in November–December 1980 fell below 80 per cent of the standard weight for length, and the index changed little in the other months.

On this evidence, significant numbers of children, and perhaps their parents, are malnourished in a district of low potential in the Southern Sudan. Severe malnutrition, where the weight-for-age index is 60 per cent or less under the standard, hardly ever appears as a problem. A disconcerting finding of the survey is that while 38 per cent of children were below 80 per cent standard weight for age in May 1981, only 12 per cent were considered to be thin by their mothers. Most of these children showed signs of marasmus rather than kwashiorkor, being small and thin rather than having swollen stomachs and hair-colour changes. The dangers that they face from increased sickness is borne out by the data. Of the 195 who were under 80 per cent standard weight for age in November/December 1980, 13 per cent had diarrhoea and gastro-enteritis, and 21 per cent had coughs and fever. It is revealing to note that in the rural areas of the district the children of

farmers were less likely to be malnourished than in households where
the head was in paid employment or was a trader or shopkeeper. Mishandling of money income and/or lack of direct access to food
supplies are evidently factors in explaining this result. In addition, better educated households were less likely to have an underweight child.

In the very south of Equatoria, Yei River district and Kajo Keji sub-
district have the greatest agricultural potential, and they have been
more exposed to cash cropping than most other parts of the Southern Sudan. Nutritional data in the form of anthropometric measures were
collected from children attending government-operated monthly
health clinics in the latter part of 1980, and although not representative
of the entire survey area, between one-fifth and one-third of those
under one year, and between 30 and 40 per cent of those between 1 and 5 years, were at risk of being malnourished, according to the weight-
for-age standard. No significant difference appears between the
children in coffee and non-coffee growing areas. The months when
least weight was gained were June, July, and December, reflecting the
nutrition and health problems of the previous months and those
associated with the hungry period before the first seasonal harvest. In
addition, there is often a conflict between the heavy demands on
women’s time for planting, weeding, and harvesting, and the need to
prepare meals for small children. The greatest weight gain was in
August, reflecting the improved food supply situation with the early
harvests of sorghum, maize, and groundnuts.

Between 20 and 30 per cent of female respondents, depending on the
time of year, claimed to have insufficient food. Apart from the fact that
not enough land was cleared, even if available, because of labour
constraints, too many crops were planted for cash, particularly coffee
and tobacco, rather than for household consumption. Output was often
reduced by the ravages of pests, and too much was sold immediately
after the harvest or when market prices were high. In addition, those
in salaried employment were sometimes not able to purchase, let alone
grow, their food. The most numerous child diseases reported were
predictably malaria, diarrhoea, vomiting, coughing, worms, stomach
trouble, and bilharzia.

Various other ad hoc nutrition studies have been undertaken in the
Southern Sudan in the past decade, and the overall impression is that

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2 Kurup, op. cit.
significant numbers of children are at risk of malnutrition, the severity of which depends on the time of the year. For example, in a baseline survey carried out by the African Medical and Research Foundation in Bahr El Ghazal in 1979, 18 per cent of those aged 1–5 in one village, and 13 per cent in another, had mid-arm circumferences showing possible malnutrition. Alternatively, on the weight-for-age index, 20 and 26 per cent of the children in the two villages were suspected of being malnourished. The comparison of weight and head measurements gave the highest indication of malnutrition, with 54 and 45 per cent of the children being below standard. Eye disease was also apparent in this survey; 7 per cent of the inhabitants in one village suffered from conjunctivitis, and 17 per cent showed such indications in the other.

In a survey conducted in Juba town in 1979–80 the overall situation appeared to be equally disturbing, since about 30 per cent of the children under 5 years of age showed evidence of protein calorie malnutrition (P.C.M.). In the Kator area, 13 per cent of those aged 9–20 months exhibited one or more signs of P.C.M., and one month later the incidence was 22 per cent for those aged 5–35 months. In the Malakia area, 35 per cent of the latter age group showed at least one sign of P.C.M., and in Rejaf, just outside Juba, the figure was as high as 39 per cent.¹

In 1981 a health survey conducted by Norwegian and German voluntary agencies in the Imatong mountains, in the so-called ‘green belt’ of the Southern Sudan, showed that even in this relatively rich agricultural area, 50 per cent of the children were underweight for age, and 40 per cent had arm circumferences that indicated suspected malnutrition.

A survey in urban Wau, the capital of Bahr El Ghazal, revealed in 1981 that 30 per cent of the children were under the 80 per cent standard weight for age, and that 20 per cent were under the 90 per cent standard height for age, and possibly stunted. According to the weight-for-length index, up to 22 per cent of children were below the standard, and possibly wasting. Another survey carried out in the same town in mid-1984 revealed that 37 per cent of children under the age of six were below the 80 per cent standard weight for age, and 36 per cent were under the 90 per cent standard height for age, and possibly stunted. The nutritional status of the children in Wau, therefore, seems to have worsened in the three years between 1981 and 1984.

¹ Ibid. p. 28.
A survey was completed in a pastoralist area in the Southern Sudan where rapid socio-economic changes are likely to be experienced when the Jonglei canal project is eventually completed. A general physical examination of the sample population revealed that the nutritional value of the daily intake of children was less than recommended, and that the calorie value of the food of adults was less than half that of the W.H.O. standard. Based on a 24-hour recall of what they had consumed, pregnant women were reported to have the remarkably low intake of 747 calories per day, and this could not be expected to support any active person for very long. The calcium intake was generally low, measuring only 15 per cent of W.H.O.-recommended allowances for pregnant women. Laboratory examinations also revealed that many of the inhabitants in the area were anaemic and affected by numerous parasites.

Further information on the nutritional status of the population of Equatoria has been provided by the W.H.O./Unicef joint nutrition support project. Data collected in child-welfare clinics in 1983 in Kajo Keji, a relatively prosperous area in Yei district, show that the proportion of children below 80 per cent of the standard weight for age ranged from a low of 31 per cent in April to 51 per cent in July, and that in August as many as 16 per cent of them would be considered to be severely malnourished because they fell below 60 per cent of the standard. In 1981 the villages of Logire and Oluro in Eastern Equatoria were surveyed, and 30 per cent of the children were found to be malnourished. In Juba rural district almost half those under 5 were less than 80 per cent of the standard weight for age. In Western Equatoria, in Maridi and Yambio districts, between 12 and 27 per cent of the children were below the 80 per cent standard weight for age, although less than 4 per cent were under the figure which would indicate chronic malnutrition.

In the Atlabara area of Juba town a sample of 127 new-born babies monitored during their first 12 months of life showed that their weight

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1 The $ multi-million Jonglei canal project seeks to divert the waters of the White Nile away from the swamps of the Sudd, mainly in order to reduce the rate of evaporation and increase the flow of water to the Northern Sudan and Egypt. Construction activities have been suspended since 1983 because of the worsening security situation in the Southern Sudan. Cf. Paul Howell, Michael Lock, and Stephen Cobb (eds.), The Jonglei Canal: impact and opportunity (Cambridge, 1988), for a multi-disciplinary survey of the complex interrelated hydrological, ecological, biological, and human problems involved.

2 A number of nutrition surveys report that pregnant women may purposely decrease their food intakes in order to ensure an easier delivery by reducing the birth-weight of their baby.

gain was satisfactory during the first three months. Their growth rate then slowed so much that by their first birthday the mean of the survivors equalled the third centile for healthy girls: 28 per cent were below 80 per cent of the standard weight for age and hence moderately malnourished, while 5 per cent were less than 60 per cent of the standard and their condition was severe.

It is difficult to make any general assertions about the nutritional status of children in the Southern Sudan since the evidence that has been presented is drawn from widely dispersed *ad hoc* surveys at different times. The quality of the data collected and the sampling methods employed no doubt vary enormously, and no attempt at standardising the approaches seems to have been made. However, this diverse evidence suggests that, at a minimum, at least one-third of young children are underweight for their age and are at risk of being malnourished. During the hungry months of June and July, before the onset of the first harvest, the proportion at risk is likely to be greater. As explained by Alan Woodruff et al.:

The long-term effects of the poor development of babies can only be conjectured, but there is increasing evidence that such a condition is later associated with abnormally high mortality rates.¹

What are some of the possible reasons for the poor nutritional status of children in the Southern Sudan? Obviously, the general state of underdevelopment, together with all that this implies for the human condition in a harsh tropical environment, must lie at the heart of any explanation. The monitoring project in Juba concluded that infections, especially malaria with associated diarrhoea, rather than chronic primary malnutrition, impaired the growth prospects of the infants in the sample. A feature of the second six months of life of these children was the tendency for weight to fall severely – and not to catch up – after attacks of diarrhoea, bronchitis, malaria, and measles.

In addition, malnourishment is precipitated by poor social conditions, especially the practice of mothers going to work for most of the day and leaving their babies in the care of children who may be only aged 7 or 8. There was no obvious shortage of food in Juba, and only a few parents in the survey could not afford to purchase enough of the local staples. Food taboos are widespread in the Southern Sudan, and those affecting children include the ban on some meats. The restriction on certain foods being served to sick children is especially damaging to their chances of early recovery. Furthermore, the conflict between the heavy work demands placed on women and the need to prepare food

¹ Woodruff et al. loc. cit. p. 10.
for young children, especially in the peak seasons of weeding and harvesting, is stressed repeatedly as a cause of underweight children. For example, Woodruff et al. arrive at the following conclusion:

Improvement in the lot of infants born in Juba and much of the Tropics will no doubt have to wait for improvements in environmental hygiene and socio-economic conditions, but meanwhile day care centres could do much for selected infants and young children in making good deficiencies in feeding and care during working hours... The dominant role that preventable infection plays in shaping the development of these infants leads to the conclusion that until hygiene, sanitation, water supplies, and malaria control can be improved, the life of infants in Tropical Africa generally, and the Southern Sudan in particular, will be hazardous... Health education directed to a few specific points can do much to obviate the hazards.¹

2. Health

Diseases resulting from poor environmental sanitation constitute the great bulk of health problems in many third-world countries. According to the limited hospital and dispensary records in the Southern Sudan, the leading causes of death are, in order of importance, the following: (i) malaria, (ii) measles, (iii) infantile gastro-enteritis, (iv) other newborn and childhood illnesses, (v) respiratory infections (including tuberculosis), (vi) trauma/accidents, (vii) diarrhoeic disorders, and (viii) other communicable diseases.²

Unfortunately, the direction of expenditures in the health sector have not been addressed to these problems. A large proportion of the Ministry of Health’s budget has been traditionally committed to curative medicine, and to the maintenance and operation of facilities and services which tend to treat the endemo-epidemic diseases rather than to eradicate them at their source. In more recent years, however, partially with the assistance of voluntary agencies, priority has shifted to preventive and social medicine, with emphasis on primary-health-care programmes. These include infant and childhood immunisation, control of diarrhoeal diseases through oral rehydration therapy, more clean water through the provision of boreholes, improved sanitation, maternal and child-health care, and child spacing.

The inadequate data collected on incidence of disease makes it necessary to rely on various instrumental measures of health deficiencies. For example, there are no reliable estimates of infant mortality rates for the whole of the Southern Sudan other than those

¹ Ibid. pp. 9–10.
² African Medical and Research Foundation (A.M.R.E.F.), Health Manpower in Southern Sudan (Juba, 1984).
based on various sample surveys, while some may be mere guesswork. For example, infant mortality is estimated to be 150 per 1,000 in Equatoria,\(^1\) 290 for the first five months of life in Mundri district,\(^2\) 150 in the Southern Sudan,\(^3\) 118 in Juba town,\(^4\) 140 in Equatoria,\(^5\) and 157 for the settled population only.\(^6\) Survey results from four villages in Equatoria between 1981 and 1984 estimate infant mortality to be between 152 and 195.\(^7\) In Yei, which is one of the most dynamic areas in the Southern Sudan, the infant mortality rate has been put as high as 250 per 1,000, with a reported figure of 90 per cent for babies and 30 per cent for mothers following Caesarian operations in Yei hospital.\(^8\)

**Table 1**

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<th>Health Facilities and Personnel in Equatoria Region(^9)</th>
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<td>Laboratory Assistants/Technicians</td>
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<td>Health Statisticians</td>
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5. W.H.O./Unicef, op. cit. p. 3.
In assessing the effectiveness of the basic services in the health sector it is useful to consider the available staff and facilities in relation to Equatoria Region, and their accessibility to the general public – see Table 1. The overall ratio of doctors to population is exceedingly low, and their distribution is very uneven, as 76 per cent are concentrated in Juba.\(^1\) While only 13 per cent of Equatoria’s population reside in the urban and semi-urban areas of Juba, Yei, Yambio, Torit, Kapoeta, and Tombura, this is where 60 per cent of the health personnel are located. They also contain the only dentist and all health educators, nurses/midwives, health visitors, and public health officers. Just 4 per cent of doctors, 12 per cent of medical assistants, 14 per cent of certified nurses, and 30 per cent of laboratory assistants and technicians are working in the rural areas.

In addition, there are severe shortfalls in the allocation of manpower between preventive and curative medicine; indeed, only 20 per cent of personnel are involved in primary-health care and community-based programmes.\(^2\) Furthermore, the existing imbalance in the ratios between the various cadres is unlikely to be corrected in the foreseeable future. For example, the excess supply of nurses \emph{vis-à-vis} other much-needed staff will be exacerbated once the large number currently in training take up their posts. As the 1984 health manpower report warned:

This situation, which breaks the continuity and complementary functions of the health team, creates problems of inadequate supervision, low productivity and low efficiency – all of these important aspects of manpower development and deployment.\(^3\)

In spite of the manpower deficiencies in Equatoria the conditions there are much better than those found, for example, in Upper Nile, which has only one-half the number of health workers despite a population that is almost double in size. The ratio of doctors per 100,000 population is estimated to be 98 in the Sudanese capital of Khartoum, and within a range of 3–13 for other regions, albeit only 0.7 and 0.8 in Upper Nile and Bahr El Ghazal, respectively. Apart from the continuing need for more doctors, the most serious shortages are in other cadres. Although medical assistants are particularly important in such a poor country, since they deputise for doctors and are in major

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\(^1\) In neighbouring Kenya in 1976, the number of doctors and registered nurses per 100,000 population was 10 and 95 respectively, more than double the ratios found in Equatoria. See Dharam Ghai, Martin Godfrey, and Franklyn Lisk, \emph{Planning for Basic Needs in Kenya: performance, policies and prospects} (Geneva, 1979).

\(^2\) A.M.R.E.F., op. cit. p. 23.

\(^3\) Ibid. p. 68.
positions of responsibility, particularly in the maintenance of rural services, they represent only 14 per cent of all health personnel in the Southern Sudan, while specifically trained maternal child-health workers constitute less than 1 per cent of the sector's manpower, despite the fact that mothers and children make up at least 40 per cent of the population.

If the Southern Sudan is to reach the internationally recommended norms of the World Health Organisation, the following increases would be needed: 250 per cent for nurses, 300 per cent for nurses/midwives, 625 per cent for health visitors, 900 per cent for doctors, and 3,000 per cent for primary health officers.

Given the demonstrated paucity of expertise in the rural areas it comes as no surprise to find that accessibility to health facilities for the great majority of the population is woefully inadequate. The only hospital in Mundri district has 46 beds, employs one doctor and two medical assistants, and serves a population of 36,000. The staff see 4,500 out-patients a month and lack drugs, a proper theatre, X-ray equipment, and a maternity ward. Most primary-health-care units are reported to lack basic equipment and appropriate medicines, not to mention even paper to record details of patients examined.¹ The nearest health dispensary is more than 8 kilometres away for about 80 per cent of all those who live in the district's sub-villages, and half of these are located at least 25 km from such essential help.² The situation elsewhere in the Southern Sudan is likely to be equally unsatisfactory. For example, the health facilities in parts of Eastern Equatoria are no more accessible: roughly 40 per cent of the villages in both sub-districts of Yei are more than 16 km from a dispensary, and about one-third are 8 or more kilometres from even a dressing station.³

3. Water and Sanitation

The consumption of contaminated and polluted water is the principal cause of ill-health in the Southern Sudan. The main sources of water are rivers, streams, wells, and boreholes, and while the great majority of the population has ready access to these, at least in the wet season, the supply of safe, clean water is severely restricted. Both wells and springs are usually unprotected and contaminated by human and

animal waste. Water-borne diseases are particularly severe during the wet season, and therefore coincide with the period of peak labour activity, with serious negative consequences for productivity and agricultural output.

Table 2
Distances of Villages from Dry-Season Sources of Water

<table>
<thead>
<tr>
<th></th>
<th>Under 1.5 kms</th>
<th>1.5 to 8 kms</th>
<th>More than 8 kms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yei sub-district</td>
<td>38</td>
<td>57</td>
<td>5</td>
</tr>
<tr>
<td>Kajo Keji sub-district</td>
<td>46</td>
<td>54</td>
<td>0</td>
</tr>
<tr>
<td>Mundri district</td>
<td>17</td>
<td>56</td>
<td>27</td>
</tr>
</tbody>
</table>

Table 2 shows the proportion of villages in three areas within range of dry-season sources of water. The population in Mundri district is much worse off than in Yei and Kajo Keji sub-districts. While the mean distance that needs to be travelled in the wet season in Mundri is less than 1.5 km, finding water in the dry season is a major problem as small streams and shallow wells dry up. This lack of clean, all-season water supply inevitably reduces the quality of rural life. In Mundri it was observed that whole communities move in search of water in the dry season, with severe detrimental consequences for agricultural development. There is little incentive to grow cassava, for example, since this might be damaged by wild animals, and late-maturing crops would need to be abandoned. Meanwhile, the situation in the urban areas is not any better. In Juba town, only 13 per cent of households are estimated to have functioning water connections inside their compounds. The distances walked to collect water from the Nile, or from public taps or wells, are often long for residents in the lowest classes of housing areas – for example, over three kilometres for one-third of households in Kator.

Closely connected to the problems of contaminated water and related ill-health are the poor sanitary habits of the population. In the nutrition survey in two villages in Western Equatoria, only 5 per cent of female respondents said that they sometimes boiled their drinking water. In Yei, only 4 per cent of women ever boiled their water, although 84 per cent of them thought that it was dirty. Almost 60 per cent of Juba households are using untreated water from the river or *khors* as their main source. Even the 35 per cent of households relying

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1 Sources: ibid. and ‘Mundri Agricultural Development District’.
on the town supply, via private or communal taps, ought to treat the water to ensure its safeness, but few ever do. At the same time, 79 per cent of Juba’s population have no sanitation facilities whatsoever, and simply resort to ‘the bush’. Although three-quarters of the households in Malakia in Mundri town are reported to have a pit latrine, only a few had built one in the rural areas. In Yei and Kajo Keji in 1977–8, 43 per cent of respondents had a latrine, and this figure had gone up to 61 per cent by 1980. In the two rural villages of the Western Equatoria nutrition study, as many as 80 per cent of respondents claimed to have a pit latrine, and the widespread use of such essential sanitation facilities may help to explain the relatively healthy state of the population as revealed by medical examination.

4. Education

A national objective of the Sudan is to attain universal primary-school enrolment by the year 2000. However, given the existing weakness of the education sector in the Southern Sudan, together with the financial constraints of the regional governments, it is most unlikely that this target can be attained, even if there was no civil war.

The underdevelopment that characterises the Sudan includes very low levels of formal education. From the 1955–6 census it was estimated that approximately 95 per cent of the population had never attended school, and in the Southern Sudan this proportion was even higher. Since that time it is widely believed that attendance has risen considerably, although no national data are available with which to quantify these improvements. Information collected in the 1973 census showed that less than 20 per cent of those aged between 7 and 24 in the Southern Sudan were attending school, or had previously done so. Provincial differentials were quite wide: while 44 per cent had been to school in Equatoria, only 19 per cent in Upper Nile and 5 per cent in Bahr El Ghazal had received any kind of formal education. By 1984–5, primary-school-age enrolment was 45 per cent in Equatoria, but only 16 per cent in Upper Nile and 6 per cent in Bahr El Ghazal.

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2 Cheesmond, op. cit. p. 13.
An indication of the changes taking place in the education sector of the Southern Sudan can be found in Table 3, although the figures do not include the many non-governmental primary schools which are largely controlled and financed by local communities. It seems clear that the improvements have been modest at the government-run primary level during the seven year period 1975-6 to 1982-3, because the average annual growth rate of 3.5 per cent in enrolments barely exceeds the likely growth in the school-age population. However, most expansion has taken place at the next level, with enrolments in the junior- and senior-secondary schools growing annually at the rate of 13.7 and 26.6 per cent, respectively, with most progress being made in Bahr El Ghazal and Equatoria. However, the wisdom of pursuing such an educational policy, although followed in many other African countries, is highly questionable. As demonstrated, for example, by George Psacharopoulos, social rates of return to education in developing countries are often greatest at the primary level, and this is likely to be the case in the Southern Sudan where existing rates of enrolment are so low. Indeed, it was recently established that just a few years of education make a significant difference to the earning power of both proprietors and wage employees in Juba's informal economy.

Other studies have revealed how important primary education is for the efficiency and productivity of small-scale subsistence farmers.

The allocation of scarce resources to expand the relatively more expensive secondary-education level has severe implications for the labour market. Student aspirations for white-collar jobs are created, manual labour, particularly farm work, is scorned, and rising rates of rural-urban migration are often attributed to this kind of educational expansion. The consequences of these policies in the Southern Sudan may have entered a new phase. The Regional Government that was formed after the peace agreement in 1972 was able to absorb many of the young Sudanese who had just completed their secondary education. More recently, however, the situation has changed dramatically, with a moratorium being imposed on new recruitment into the civil service. Given the absence of a modern private sector which could absorb the


<table>
<thead>
<tr>
<th>Province</th>
<th>Junior Secondary</th>
<th>Senior Secondary</th>
<th>Teacher Training</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary</td>
<td>Secondary</td>
<td></td>
<td>Schools Students</td>
</tr>
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<td></td>
<td>Schools Students</td>
<td>Schools Students</td>
<td>Schools Students</td>
<td>Schools Students</td>
</tr>
<tr>
<td>Bahr El Ghazal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975-6</td>
<td>167</td>
<td>18</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1982-3</td>
<td>174</td>
<td>25</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>0.6</td>
<td>0.06</td>
<td>0.6</td>
<td>0.06</td>
</tr>
<tr>
<td>Equatoria</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975-6</td>
<td>151</td>
<td>21</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>1982-3</td>
<td>210</td>
<td>52</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>4.8</td>
<td>1.8</td>
<td>4.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Upper Nile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975-6</td>
<td>127</td>
<td>17</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>1982-3</td>
<td>189</td>
<td>38</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>5.8</td>
<td>2.2</td>
<td>5.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Southern Sudan</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1975-6</td>
<td>445</td>
<td>56</td>
<td>8</td>
<td>2</td>
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<tr>
<td>1982-3</td>
<td>573</td>
<td>115</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>3.7</td>
<td>1.9</td>
<td>3.7</td>
<td>1.9</td>
</tr>
</tbody>
</table>

growing number of secondary-school leavers, their future employment prospects look bleak.

Some idea of the minimum gap which has to be filled if universal primary education is to be attained may be gained by looking at the situation in Equatoria, albeit the most advanced region in the field of education in the Southern Sudan. For example, a recent W.H.O./Unicef report that only about one-quarter of all children under the age of 15 were attending school in 1983–4 suggests that the enrolment rate had declined over the previous eight years. Evidently, the growth of the school-age population has far outstripped the supply of teachers and buildings. Within Equatoria, however, there is a wide geographic dispersion of educational opportunities as evidenced by the variation in enrolment rates. Indeed, 80 per cent of all the primary-school students are to be found in the four districts of Yei, Torit, Maridi, and Juba town, although they constitute only 51 per cent of the overall population of Equatoria, confirming that those who live elsewhere are relatively deprived of school places. Furthermore, the disadvantaged position of girls is evident: they are responsible for only 36, 28, and 15 per cent of enrolments at the primary, junior and secondary, and technical secondary levels, respectively.

In urban Juba on the other hand, while the overall mean number of years of schooling completed is low – 7 for males and 4 for females – there is evidence to suggest that improvements have been made in recent years. For example, of those aged 30–34, twice as many men never attended school (18.7 per cent) as in the 20–24 cohort (9.2 per cent), and the improvement for females is even greater between these two age-groups. In addition, rising proportions of younger persons of both sexes have been attending junior- and senior-secondary schools compared with those aged 30 and over. However, these data leave no room for any complacency since almost one in 10 men and one in 4 women aged between 18 and 24 have never been to school. Of those aged 18–29, almost one in 3 males and more than 2 in 5 females have failed to progress beyond the primary level.

Other scattered pieces of evidence from various small-scale surveys confirm the poor state of education in the Southern Sudan. For example, only two-thirds of men and one-third of women in Yei have even been to school. In a small survey in the Malakal area in Upper

3 'Yei District Agricultural Development Plan', p. 17.
Nile it was found that only 3 per cent of household heads are literate, and that only 14 per cent of households contained a literate adult member.¹ In the pastoral areas of Gogrial and Rumbek in Bahr El Ghazal only 14 and 6 per cent, respectively, of household heads are literate in at least one language.² While education may have been better developed in Gogrial than in most other pastoral areas, largely because of the presence of a mission near the town, the district of 340,000 people in 1983 contained only one junior-secondary school with 303 pupils in 1977–8, only four of whom were girls.

The quality of the little schooling that is provided in the Southern Sudan is very unsatisfactory. The tragic consequences for both human resources and overall socio-economic developments must be profound. Even in the most highly monetarised part of the rural economy, in Yei district, the educational system has been sadly neglected:

Of the three secondary schools in Yei district, one lacks furniture and equipment, another has no buildings, while a third has been closed because there is no food for the pupils… Schools in general are of the most basic construction; most are short of accommodation and several have to share buildings; they lack staff, particularly trained staff, furniture, equipment and teaching aids. Children do not start until the age of seven while most receive only 5 months schooling per annum due to shortage of teachers. The people of Yei equate schools with development. The present standard of education is, however, a constraint to the future development of the area.³

The poor condition of schools is confirmed by data from Bahr El Ghazal. Of the 130 primary schools in that region in 1981, as many as 84 (65 per cent) had no buildings and only 24 (18 per cent) were considered to be in good condition or had been repaired. In Raga district, where 74 per cent of the schools had no buildings, only four had a pit latrine.⁴ Very wide disparities are also observed in student–staff ratios: although the overall average is 28 primary pupils per teacher, the figure is as high as 94 in Aweil district, albeit down to 35 in Raga and only 20 in urban Wau. As a recent Unicef report concludes:

More than the quantitative deficiencies, it is the incredibly low standard of education in qualitative terms which is worrying. All the indications from the study analysis are that education in Bahr El Ghazal is in a very bad state, to say the least… the schools have only been functioning, on average, for four years.

³ ‘Yei District Agricultural Development Plan’, p. 18.
months a year for the last few years... Not a single primary school in Bahr El Ghazal has a satisfactory standard in educational facilities.\(^1\)

Perhaps the best evaluation of an educational system is that provided by an assessment of the quality of its staff. A recent survey of 240 primary-school teachers in Equatoria, designed to measure their ability in English, arithmetic, and general knowledge, came to the following depressing conclusion:

The academic standard of the teachers is alarmingly low. About one-third of the teachers are essentially innumerate, and illiterate in English – such people should not be in the teaching profession... Primary schools are the foundation of all formal education systems. These examinations have shown the standard of the Sudanese primary school teachers to be appallingly low.\(^1\)

In short, it is not only that the vast majority of the Southern Sudanese are denied access to any form of education, but that the quality of what is provided at the elementary level is of a severely low standard.

\textbf{THE CHARACTERISTICS OF THE POOR}

The inequalities of real income that exist among rural and urban households in the Southern Sudan may appear imperceptible to the casual observer. However, detailed information painstakingly collected in sample surveys conducted in recent years by the author from households in the region, show that such an inference would be grossly misplaced. While the great majority of the population is, no doubt, absolutely poor, in the sense that many basic goods and services are scarce and that income and food security are precarious, some of the inhabitants are much better-off than others. For example, the richest 5 per cent of households in urban Juba receive 38 per cent of total income, while the richest 10 per cent obtain as much as half.\(^3\) The Gini coefficient for this distribution of income is 0.58, which indicates extreme inequality.\(^4\) In the rural areas the picture is similar. In Kajo

\(^{1}\) Berhane Woldemichael, 'Primary Education in Bahr El Ghazal Region, Sudan', Unicef, Juba, 1983.


\(^{3}\) House, 'Population, Employment and Inequality at the Household Level in Urban Juba'.

\(^{4}\) As a measure of income distribution, the Gini coefficient has a maximum value of unity (absolute inequality) and a minimum zero (absolute equality). It can be calculated as

\[ G = 1 + \frac{1}{n^2} \sum \frac{y_i}{n} (2n - 2n) \]

where \(y_1 \ldots y_n\) represent individual income in decreasing order of size, \(\bar{y}\) is the mean income, and \(n\) is the number of individuals. It should be noted, however, that the Gini coefficient is only a measure of relative size, and that one distribution might be more equal than another over one range, less equal over a succeeding range, and yet both might record the same coefficient. See David Pearce (ed.), \textit{Macmillan Dictionary of Modern Economics} (London, 1986), p. 170.
Keji district, near the Uganda border, the poorest 10 per cent of households receive only 1 per cent of total income, the richest 10 per cent gain 42 per cent of income, and the Gini coefficient is 0.53. The comparable index for the distribution of household cash income in the Acholi area, also in Eastern Equatoria, is 0.38.

The poorest 20 per cent of households often display certain demographic and economic features which differentiate them from the rest of the population. For example, in urban Juba, a disproportionate number are headed by females, and many belong to the Bari who are indigenous to the area around the town. Life-cycle factors are also important. As family formation takes place, the number of children and the dependency burden increases, as does the likelihood that households will fall into the poverty category. Labour-market status makes a difference, since many of the heads of poor households work long hours in the low-productivity informal sector or are unemployed. Since there are most opportunities for employment in the public sector, where inevitably applicants seeking jobs are screened for their educational attainments, it is hardly surprising to find that an important determinant of a household's income status is the level of schooling enjoyed by its head. Education also helps to improve entrepreneurial earnings in the informal sector. Therefore, the poor are most likely to be the least educated and, given their reluctance to send their children to school, poverty will be inherited by their unfortunate offspring.

In the rural areas the origins of relative poverty lie in the large differences that exist in the various components of income. If there are no family labour constraints on the size of agricultural harvests, households can diversify their principal sources of income away from purely subsistence crops into the production of marketable surplus, into off-farm income-generating activities, and into formal-sector wage employment. Hence their ability to attain a relatively higher standard of living according to a range of locally-based indicators of welfare.

The poorest rural households are over-dependent on crop production, most of which is used for their own subsistence needs, and so in order to supplement their meagre incomes they are forced into marginal, low productivity, off-farm activities. The small size of their harvests leaves them with little marketable surplus in excess of their own consumption requirements, with the result that their accumulation of simple household assets is low, their food and protein intakes are

2 House and Phillips-Howard, op. cit.
deficient, and the health of their members suffers as a result. Again, educational attainment is important in playing a direct rôle in enhancing farm operations, by promoting increased harvest outputs and crop sales, and by the opportunity to improve managerial ability and decision-making. It also opens up the possibility of a secure job in public administration, the earnings from which can be invested in improving the family farm.

THE POLICY IMPLICATIONS

What are the policies that could raise the incomes of the great majority of the Southern Sudanese to levels above the poverty line within a reasonable time? What can be done to ensure the adequate supply of essential goods and services by both the public and private sectors?

Given the depressed state of the Sudanese economy and the heavy indebtedness of the central Government, not much can be expected from public expenditures to improve basic infrastructures and services. The onus lies on the various international development agencies whose work has been halted in recent years by the civil war. It must be they who will need to find the massive quantities of external funds, equipment, and skilled manpower to reactivate development activities once hostilities cease.

The key long-term factor will be to raise the productivity of household labour in the region by promoting appropriate and better technology and products, and by expanding labour-intensive infrastructural projects. Such an approach involves improving both the quantity and productivity of resources available to the population. This necessitates a redirection of aid-donor expenditures for credit, research, training, and technical advice which focus on increasing the output of factors of production owned and controlled by the subsistence farming population. Incorporating such measures into regional development planning requires the acceptance of a comprehensive approach which relates all major programmes, projects, and policies to the overriding, central objective of alleviating underdevelopment and poverty.

This task appears formidable, given the nature of current and prospective population dynamics in the region. Any success that may

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1 One example is the recent attempt by the Norwegian Church Aid/Sudan Programme to construct a labour-intensive feeder road in the rather isolated Acholi area of the region, so that small-scale farmers would be in a position to market their surplus crops more easily.
be achieved in the worthy attempts to lower the currently high level of infant mortality is not likely to have any immediate impact on reigning levels of fertility, so that population growth can be expected to increase fairly rapidly. This would have consequences for the household dependency burden, and raise the demands placed on the output from subsistence farmers – hence the pressing need to intensify their labour productivity is underscored once more. In addition, even greater pressures will be exerted on the education and health sectors in a situation where, as already documented, their output of services is already grossly inadequate.

The migration to the towns is rapid, and must be expected to remain so, until some success is achieved in raising rural real incomes. The effect of progressively increasing urbanisation on the existing inadequate facilities in education, health, water, sanitation, and housing can only be deleterious. Over the short and medium term, therefore, it is hard to be optimistic about any major improvements that may benefit the Southern Sudanese. The deteriorating security situation since 1983, resulting from the renewed armed insurrection, only adds to the difficult task of promoting development. The immediate goal of policy-makers must be to try to accommodate the expected future increase in population without thereby initiating any decline in the already meagre living standards.

1. Food Production

A number of possible explanations may be offered to explain the unsatisfactory nutritional status of the population, especially mothers and children. The reasons include inadequate production and/or misappropriation of household incomes, resulting in excessive sales of nutritionally essential home-produced food, low nutrient values of purchased food, and misallocation of resources between cash and food crops. In addition, the storage facilities are often unsatisfactory, as well as methods of preparing and serving food.

At the core of any nutrition policy in the Southern Sudan must be a successful diffusion of innovations which will disturb the low-level of equilibrium in the agricultural sector. This would involve an acceleration in the rate of growth of productivity, accompanied by a substantial increase in the use of superior quality, modernising-input factors. All of this calls for research into higher-yielding varieties of sorghum, millet, and other staple crops, as well as cattle and small livestock, and the expansion and improvement of agricultural-
extension services. Such innovations should involve little in the way of extra cash expenditures by small farmers, or on basic infrastructures by the impoverished regional governments, because most of the funding for such activities must come from outside sources. At the heart of such a comprehensive approach to food and nutrition lies more research and extension, aimed at overcoming existing constraints and expanding production for home consumption, raising the availability and quality of food for sale in local markets, and increasing cash incomes.

Better roads and communications should lead to increased competition between traders and, when combined with improvements in crop storage and price information, should lower price fluctuations and reduce those risks in producing for the market to which small farmers are most averse. Appropriate technology in the form of improved tools and food-processing equipment would raise labour productivity, expand food production, and release some labour for non-farm income-generating activities. In areas where feasible, the introduction of ox-ploughing would carry production to a higher stage of technology beyond the constraints imposed by simple hand-tools. Apart from improved implements, better cultural practices will be important in raising labour productivity. For example, the crop rotations, mixes, and varieties to be incorporated into extension packages should seek to increase flexibility in the timing of inputs, which would allow a more even distribution of labour use over the agricultural calendar and avoid peak demands. Research should seek to reduce the risks inherent in farming in a drought-prone environment, and to promote the conservation of soil fertility.

A recent I.L.O. study of farm-equipment innovations in Africa has emphasised the role that can be played by research and development as regards improvements in what is being used already.¹ A great deal of emphasis is given to the potential advantages of ox-drawn technology, which would raise labour productivity by overcoming the seasonal labour constraints, and by generating the conditions for a diversified rural economy, including small-scale metal workshops. Equipment innovations are felt to offer great promise in increasing food production, precisely because the timing of operations in relation to rainfall is the major determinant of crop yields. Aside from the environmental and cultural constraints, Bruce Johnston suggests that the limited use of ox-ploughing in the Southern Sudan is explained by

the extremely restricted purchasing power of the small farmers.\textsuperscript{1} He underscores the importance of encouraging a rural strategy which maximises the positive interactions between agricultural and industrial development. As farm incomes expand, a pattern of rural expenditure is generated which provides a stimulus for the expanded manufacture of both farm inputs and consumer goods by relatively small rural-based workshops utilising labour-using, capital-saving technologies. At the same time, commercial production of farm products is stimulated by accelerated employment in manufacturing and related services.

In their survey of farm tools currently in use in the Southern Sudan, J. D. de Coninck et al. show how an enormous range of locally made and imported hoes, and other implements, have been adapted to the varying environmental conditions.\textsuperscript{2} Since the widespread use of oxen would necessitate major innovations in farm equipment, they urge that efforts should be now concentrated on the wider provision of higher-yielding varieties of seeds, better marketing facilities, and stronger extension services. They suggest that the introduction of animal power will only be successful as part of a change to the whole farming system and to household economies. It may be most effectively undertaken by innovative entrepreneurs setting up as contractors to provide ox-ploughing, weeding, and transport services on a commercial basis.

Intimately linked with the needed increases in the production and marketing of food is the capacity of aid agencies to provide adequate basic social services. As explained by Johnston:

resource-saving innovations and growth of rural incomes both enlarge the capacity of the economy to support social services and direct attention to the desirability of expanding rural education and health systems because of the need for such services and the expanded employment opportunities they provide.\textsuperscript{3}

Until such time that hand tools are largely replaced by a more productive technology associated with oxen, the provision of basic services in the Southern Sudan will remain woefully inadequate.

At the more immediate practical level, every encouragement should now be given to enterprises in the informal sector to expand their output of goods and services largely consumed by the urban poor. Elsewhere, many suggestions have been made to relieve the identified


\textsuperscript{3} Johnston, loc. cit. p. 63.
constraints, which include, *inter alia*, lack of infrastructure and raw materials, inadequate funds and the absence of a local capital market, fluctuating demands and little collaboration in the form of purchasing and marketing co-operatives, and a hostile and sometimes harassing police force.¹ The promotion of a non-farm, informal sector in the rural areas should be a priority concern.

2. *Health, Nutrition, Water, and Sanitation*

The fact that so many in the Southern Sudan currently suffer from nutrition and health problems of some kind, partly reflects their low incomes and poor diet, as well as the inadequate coverage of basic rural services. Improved nutrition is intimately bound up with increased production of food. In addition, there is an identified need, given the generally low level of education, to teach both husbands and wives better feeding practices for children, how to prevent and how to treat diarrhoea, and how to improve sanitation practices. More publicity is required to convince the general population of the virtues of boiling drinking water and the need to dig pit-latrines. The leaders of the community, such as chiefs, headmen, school teachers, priests, politicians, extension staff, health workers, and other government employees can all be used to communicate such messages.

3. *Population and Human Resources*

The Sudan has no explicit population policy, although the former Southern Regional Government in its six-year development plan that was due to run from 1977–8 to 1982–3 showed awareness of the need for a strategy that would bring about a more balanced distribution between the rural and urban areas.² Evidently, the promotion of village infrastructure and agricultural productivity, which has been emphasised above, would help to realise this goal. However, the tendency of many international aid agencies to concentrate their activities in the towns, as a result of the worsening security situation elsewhere in the last few years, will probably have contradictory consequences and induce further in-migration and urbanisation.


Family planning activities by the Government are negligible, but a number of donor agencies have recently shown interest in supplying such services as part of their maternal child-health programmes. Most of them suffer, however, from a lack of knowledge about the size of the potential demand, and the kind of services that are required. Recent data from urban Juba, however, suggest that there is considerable scope for such assistance. For example, there is little knowledge and practice of 'modern' family planning, with almost one-quarter of female respondents claiming to have had more children than they think desirable.¹ For policy-makers this revelation is important since it suggests that a relatively large constituency exists for family-planning advice and services, over and above that which could be provided for women to better space their pregnancies. Since activities of the voluntary-operated Juba Family Planning Association, formed in 1983 by a group of local women, remain severely limited, financial and material support by international donor agencies is evidently warranted.

In the case of programmes designed to improve basic human resources, the appallingly low rates of primary-school enrolment suggest that this level of the educational sector ought to be given priority attention for the foreseeable future since it holds the key to any realisation of long-term development. Groups that have been identified as being denied access to education live predominantly in rural areas of the Southern Sudan, with pastoralists being amongst the most deprived. If Juba is now typical of other towns in the Region, then the urban populations enjoy a significantly privileged position, a factor, no doubt, which contributes to rapid rural-urban migration.

These quantitative and qualitative deficiencies occur because schools are not provided in some areas, and because some socio-economic groups are either too poor and/or not interested enough to send their children to the schools that do exist. Quality failings occur largely because not enough resources are invested in the needed infrastructure and supplies, and in the training of teachers, mainly because the regional governments of the Southern Sudan do not have an adequate revenue-generating tax base with which to finance a satisfactory education system. However, given the fact that the authorities have expanded secondary at the expense of primary education, where the social and private returns are likely to be greater, every encouragement

should be given to the self-help movement in generating more primary-school enrolments, and the voluntary aid agencies ought to concentrate their efforts on promoting this level of education. In addition, the authorities should encourage more secondary-school leavers, whose future employment prospects look bleak in the public sector, to take up primary-school teaching, probably by the creation of financial incentives. One way of influencing the private demand for education in the appropriate direction would be to raise the costs to parents of sending their children to a secondary school and to reduce the hidden fees at the primary level.