

## **Update on the Nutrition Situation, 1994**



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# Update on the Nutrition Situation, 1994



UNITED NATIONS      NATIONS UNIES

ADMINISTRATIVE COMMITTEE ON COORDINATION – SUBCOMMITTEE ON NUTRITION

A report compiled from information available to the ACC/SCN

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## **United Nations – Administrative Committee on Coordination – Subcommittee on Nutrition**

(ACC/SCN)

The ACC/SCN is the focal point for harmonizing the policies and activities in nutrition of the United Nations system. The Administrative Committee on Coordination (ACC), which is comprised of the heads of the UN Agencies, recommended the establishment of the Sub-Committee on Nutrition in 1977, following the World Food Conference (with particular reference to Resolution V on food and nutrition). This was approved by the Economic and Social Council of the UN (ECOSOC). The role of the SCN is to serve as a coordinating mechanism, for exchange of information and technical guidance, and to act dynamically to help the UN respond to nutritional problems.

The UN members of the SCN are FAO, IAEA, IFAD, ILO, UN, UNDP, UNEP, UNESCO, UNFPA, UNHCR, UNICEF, UNRISD, UNU, WFP, WHO and the World Bank. From the outset, representatives of bilateral donor agencies have participated actively in SCN activities. The SCN is assisted by the Advisory Group on Nutrition (AGN), with six to eight experienced individuals drawn from relevant disciplines and with wide geographical representation. The Secretariat is hosted by WHO in Geneva.

The SCN undertakes a range of activities to meet its mandate. Annual meetings have representation from the concerned UN Agencies, from 10 to 20 donor agencies, the AGN, as well as invitees on specific topics; these meetings begin with symposia on subjects of current importance for policy. The SCN brings certain such matters to the attention of the ACC. The SCN sponsors working groups on inter-sectoral and sector-specific topics.

The SCN compiles and disseminates information on nutrition, reflecting the shared views of the agencies concerned. Regular reports on the world nutrition situation are issued, and flows of external resources to address nutrition problems are assessed. State-of-the-Art papers are produced to summarize current knowledge on selected topics. SCN News is normally published twice a year. As decided by the Sub-Committee, initiatives are taken to promote coordinated activities – inter-agency programmes, meetings, publications – aimed at reducing malnutrition, primarily in developing countries.

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<sup>1</sup> United States Agency for International Development, Bureau for Global Programs, Field Support and Research, Office of Health and Nutrition and the Bureau for Humanitarian Response under the Food Security and Nutrition Monitoring (IMPACT) Project, Contract No. DAN–5110–C–00–0013–00.

John Mason  
Marito Garcia

## Foreword

Trends in nutrition are becoming clearer as new information becomes available. Steady improvement is now being seen on average in most regions of the world, with the important exception of Sub-Saharan Africa, over the 20 years since such estimates became feasible. This pattern was noted, although data were limited, in the ACC/SCN's First Report on the World Nutrition Situation, in 1987, and in its Update (1989). The Second Report in 1992–3 confirmed this, adding considerable detail with the substantial increase in available information. This Update (1994) focusses on trends in the early 1990s.

The conclusions direct attention more strongly than ever towards Sub-Saharan Africa and South Asia. Nutrition in the African region is deteriorating, possibly more so than in the 1980s. In South Asia, which has both the largest numbers of underweight children and the highest prevalences, the task is enormous, and although the underlying trend is probably for slow improvement, there is concern that this may have faltered. This report illustrates such findings with country data, drawing some overall conclusions to supplement those in the Second Report, and to bridge the gap to the Third Report on the World Nutrition Situation, due in 1995.

Rising concern for the nutrition of refugee and displaced populations led to the regular reporting on this situation amongst these populations mainly in Sub-Saharan Africa, coordinated by the ACC/SCN (known as the Refugee Nutrition Information System). The opportunity is taken with this Update Report to summarize the information available on this over the last two years, to provide a baseline description and to highlight the extreme severity of the situation. The section in Chapter 3 of this report brings this together and it is hoped this will help to stimulate more effective action. The collaboration of UNHCR, World Food Programme, and Save the Children Fund (UK), in initiating the system, its increasing involvement with a wide number of agencies and NGOs, and broadened funding (from Canada, Norway, and USA) have been crucial in bringing together this important information on a regular basis.

This Update Report continues the process of integrating data from a variety of sources, and follows the pattern in the Second Report. Nutrition is regarded as an outcome, for which the main indicator is the prevalence of underweight preschool children. Infant mortality rates are also included. The indicators and text (in Chapter 2) are clustered into topics related to food, health, and women's role and caring capacity, as underlying causes of malnutrition, in line with current thinking. In addition, the opportunity of greatly increased availability of nutritional trend data has been taken to compare these with economic growth rates, which both shows the important contribution of economic growth, and also emphasizes that substantial improvement in nutrition can be achieved over and above that explained by economic growth. This interpretation, brought forward at the SCN's workshop at the International Union of Nutrition Sciences meeting in 1993 in Adelaide<sup>1</sup>, includes the impact of health and education investments, as well as direct nutrition interventions.

<sup>1</sup> Case-studies are available for Brazil, India, Indonesia, Tanzania, Thailand, and Zimbabwe, as well as summary background material for the workshop.

The SCN's current programme of reporting on the world nutrition situation is supported by the Swedish International Development Agency (SIDA), and the International Development Research Center (IDRC, Canada), whose continuing support is very gratefully acknowledged. This programme is intended to lead to the compilation and publication of a Third Report on the World Nutrition Situation, in 1995. We are particularly pleased to have been able to carry out this work in collaboration with the International Food Policy Research Institute (IFPRI), whose contributions have been invaluable.

This report, as the others in the series on the world nutrition situation, is intended to provide accurate and up-to-date information describing trends in the nutrition situation, as a basis for better awareness and understanding, leading to more enlightened and effective policies and programmes to improve it. The intended audience is both those professionally concerned with nutrition, as well as a broader constituency concerned with development and human rights, for which nutrition is both a central objective, and indicator of progress.

Abraham Horwitz  
Chairman  
ACC Sub-Committee on Nutrition

## Chapter 1. Overview

This report updates the results given in the Second Report on the World Nutrition Situation, Volume I (October 1992) and Volume II (March 1993 – ACC/SCN, 1992/3). New data available at country level<sup>1</sup> give recent trends in prevalences of underweight children, as the main nutritional indicator, in 18 countries. These can be compared with those reported in Volume II, to give a total of 46 national trend estimates for the 1980s and 1990s (see Table 1, discussed later). Primarily, this Update Report is concerned with trends around the period 1990 to 1993. Like the previous Update Report of 1989 (ACC/SCN, 1989), it does not make assessments at regional level (the models for this are not re-estimated), but aims to look at recent short-term trends, where possible drawing implications beyond the specific countries for which data are available.

<sup>1</sup> Many national surveys have been assisted by the Demographic and Health Surveys (DHS) project.

The estimates of trends in the early 1990s are shown in Figure 1, superimposed on those from the Second Report (Vol. II, Figure 1.3, p.5). For Sub-Saharan Africa, seven of the eight trends show recent deterioration, the exception being Tanzania. This probably indicates general worsening of the nutrition in this region; the question of how typical these trends are is addressed below. In the Near East and North Africa, and in South America, it seems likely that the generally improving trends of the 1980s are continuing, and both these regions are likely to reach prevalences now typical of developed countries by around the year 2000, at the present rate. The situation is perhaps similar for many countries in Middle America and the Caribbean, however deterioration was noted in Nicaragua, and we are unsure of trends in Mexico and Cuba. In South East Asia (in which China is included in Figure 1) the signs are that the rapid rates of improvement of the late 1980s probably continued. The Philippines remains an exception, however here too rates of improvement may recently have increased. Newly available data from China indicate rapid improvement in underweight prevalences from 1987 to 1990.

Over half the underweight children in the world are in South Asia, thus estimates of trends in this region have enormous importance. New data are scarce. A surveillance system established in Bangladesh indicates improvement from 1990 to 1993 (mainly in 1992), included in Figure 1. Recent changes in the situation in India are harder to assess, as data gathered in 1991/92 are from a rather small sample – tentative results are that, of seven states assessed, three showed a deterioration, and four had no significant change. General improvement was previously estimated between 1975–79 and 1988–90. As discussed in the case study in Chapter 2, India suffered an economic slow-down in the early 1990s, and there is reason to hope that the reversal of the improving trend indicated may be temporary; there are now renewed efforts to estimate more precisely the prevalences, and these results should only be taken as an interim assessment – but they may be a warning.

More details of these estimated trends, including rates of change in percentage points per year, are shown in Table 1. This also compares the new trend estimates, highlighted in grey, with those in the Second Report (it updates Table 1.3 in the Second Report (Vol I, p.11)). The results in this table in terms of rising or falling trends are the same as those that can be seen in Figure 1. Thus it is evident that most of the estimates in Sub-Saharan Africa indicate a deteriorating situation, whereas in other countries except India the falling prevalence observed earlier has generally continued.

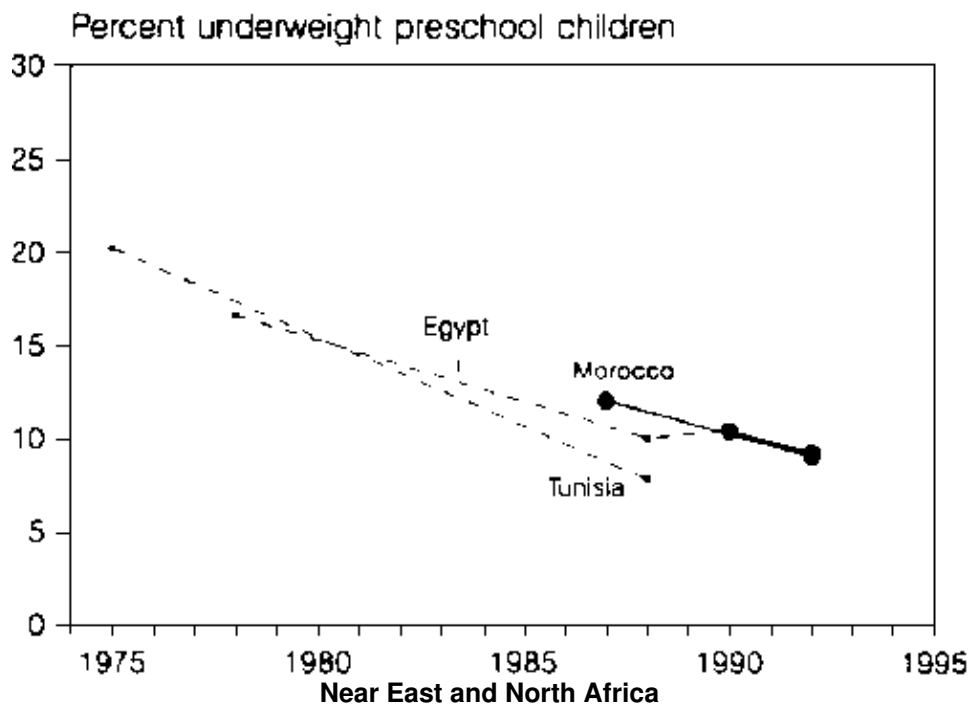
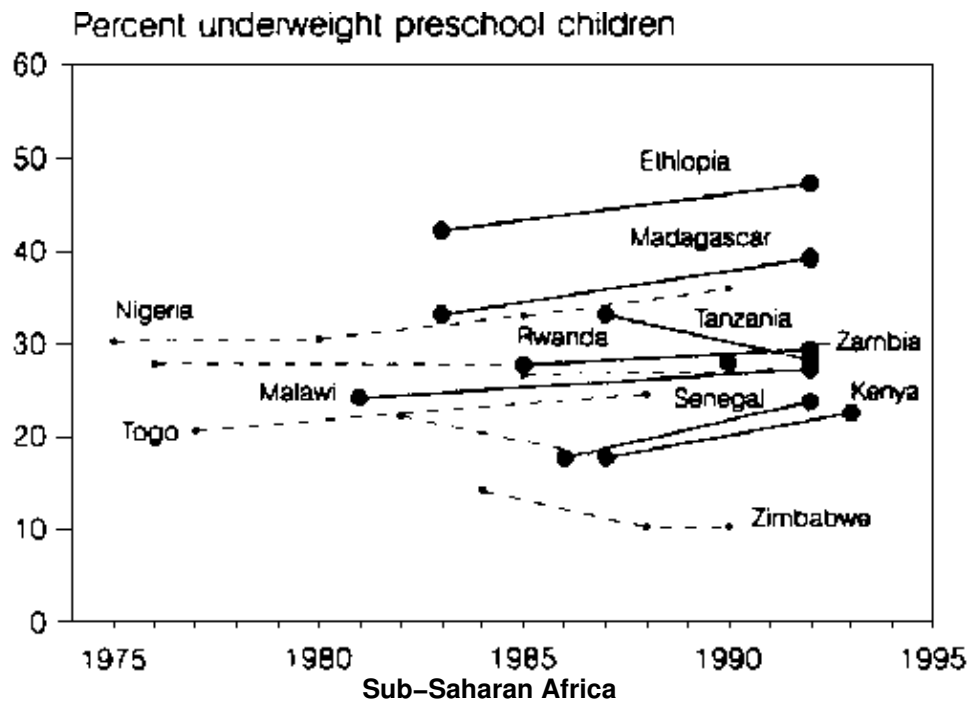
Previously, the observed rates of change in underweight prevalences were compared with those necessary to reach the nutrition improvement goals endorsed by the World Summit for Children (UN, 1990) and the International Conference on Nutrition (FAO/WHO, 1992) (see Second Report, Vol I, p.67; Vol II, p.5). In Table 1, the rates of prevalence change (in percentage points per year) are shown in the right hand column. Also in the right hand column (in brackets) are shown regional rates of change in prevalence, in percentage points per year for 1990–2000, required to meet the goals. Thus, for example, in Sub-Saharan Africa a prevalence change of –1.5 percentage points per year would on average be required to meet the goal of halving the prevalence by the year 2000; but most of the observed trends in this region are positive, indicating deterioration in nutritional status..

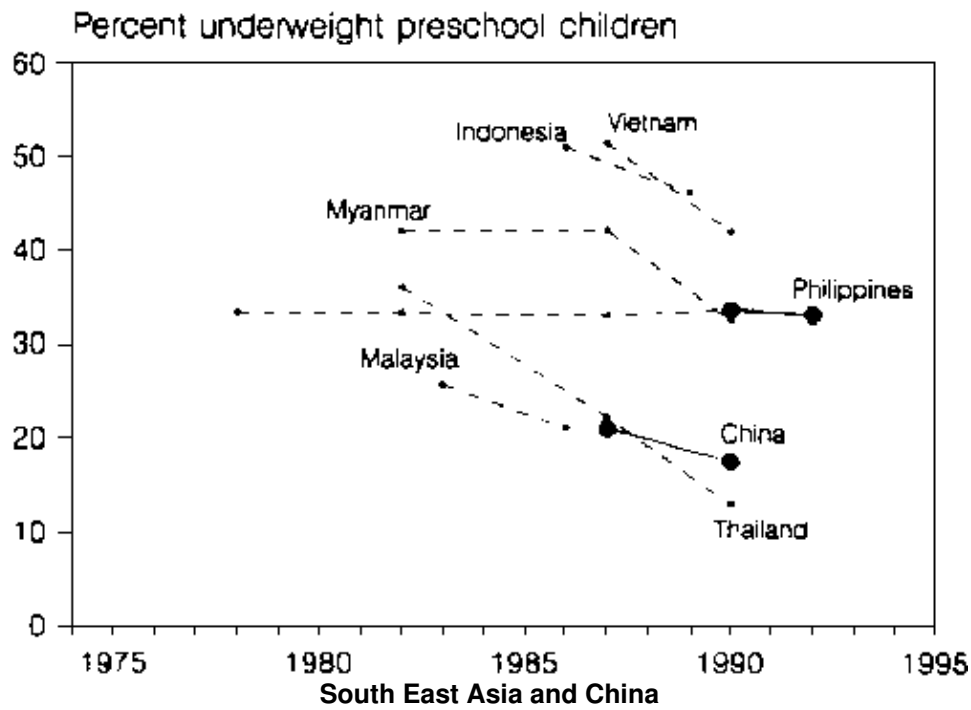
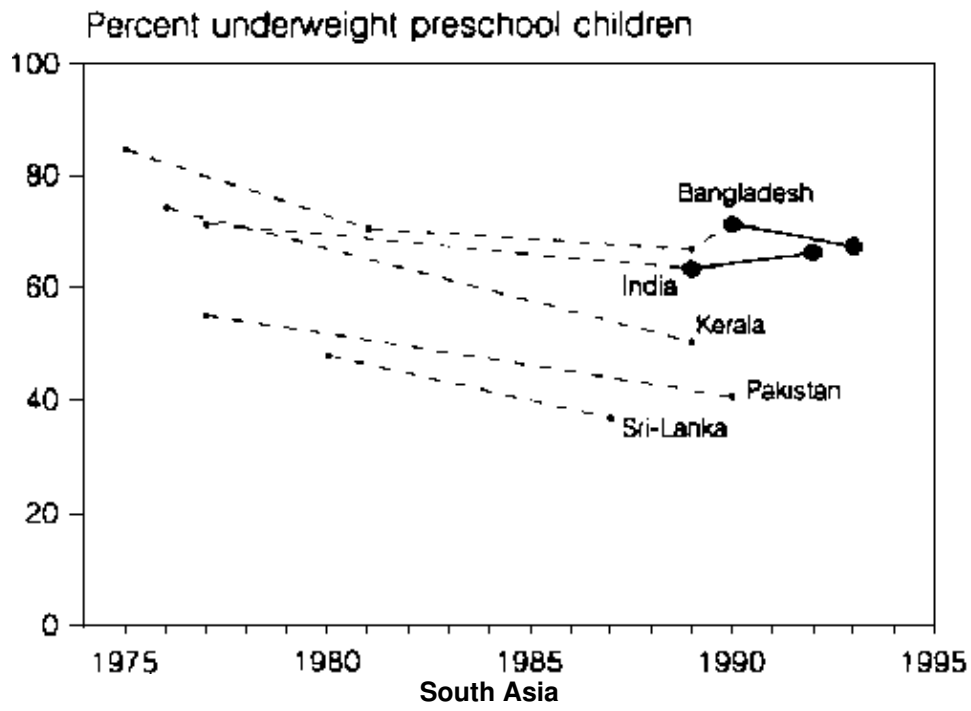
A better situation exists in other regions. In the Near East and North Africa, the signs are that the rate of improvement is around that necessary to meet the goals – although starting from a low prevalence the improvement rate required is less than elsewhere. Similar relatively encouraging conclusions can be seen in South East Asia, China, Middle America/Caribbean, and South America, with rates of improvement usually similar to those necessary to reach the goal of halving the prevalence.

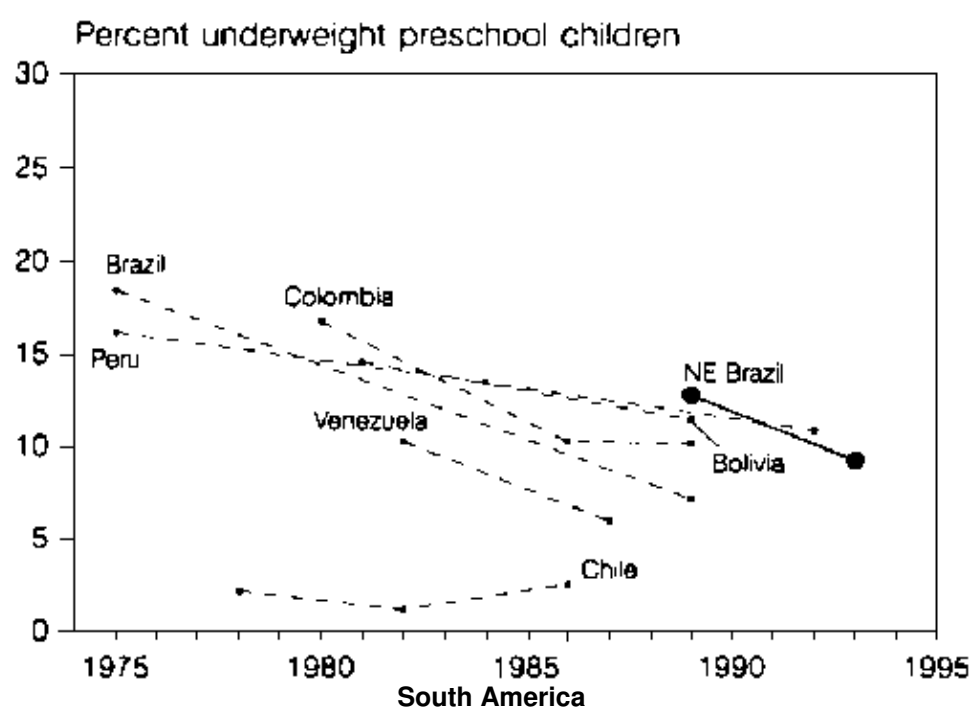
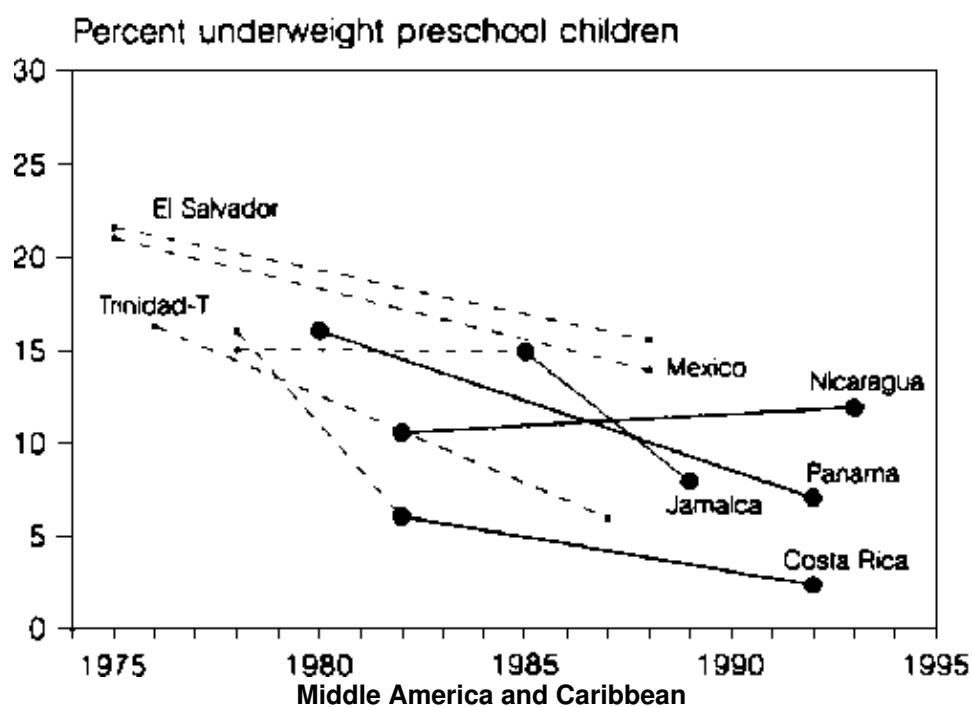


**Figure 1. Recent Trends in Prevalence of Underweight Children**

(New results are shown as solid lines and points; dotted lines are data previously given in Figure 1.3 of Second Report, Volume II, page 5)







Note: New data are those given in Table 1, highlighted; see also notes to Table 1.

**Table 1. Estimated Trends in Prevalences of Underweight Children (recent trends updating those in the Second Report are highlighted)**

Country	Year, Prevalence				Trend	Rate (pp/yr)	
	Earlier	Later					
						(rate for goals)	
<b>Sub-Saharan Africa</b>							(-1.5)
<b>Ethiopia</b>	<b>1983</b>	<b>37.3</b>	<b>1992</b>	<b>46.9</b>	<b>Rising</b>	<b>+1.07</b>	
Kenya	1982	22.0	1987	17.5	Falling	-0.80	
<b>Kenya</b>	<b>1987</b>	<b>18.0</b>	<b>1993</b>	<b>22.3</b>	<b>Rising</b>	<b>+0.72</b>	

Lesotho <sup>1</sup>	1976	173	1981	13.3	Falling	-0.80	
<b>Madagascar</b>	<b>1984</b>	<b>33.0</b>	<b>1992</b>	<b>39.0</b>	<b>Rising</b>	<b>+0.75</b>	
<b>Malawi</b>	<b>1981</b>	<b>24.0</b>	<b>1992</b>	<b>27.0</b>	<b>Rising</b>	<b>+0.27</b>	
Rwanda	1976	27.8	1985	27.5	Static	-0.03	
<b>Rwanda</b>	<b>1985</b>	<b>27.5</b>	<b>1992</b>	<b>29.2</b>	<b>Rising</b>	<b>+0.24</b>	
<b>Senegal</b>	<b>1986</b>	<b>17.5</b>	<b>1992</b>	<b>20.1</b>	<b>Rising</b>	<b>+0.43</b>	
<b>Tanzania</b>	<b>1987</b>	<b>33.0</b>	<b>1992</b>	<b>28.0</b>	<b>Falling</b>	<b>-1.00</b>	
Togo	1977	20.5	1988	24.4	Rising	+0.35	
Zambia	1985	26.5	1991	26.8	Static	+0.05	
<b>Zambia<sup>2</sup></b>	<b>1990</b>	<b>27.8</b>	<b>1992</b>	<b>29.0</b>	<b>Rising</b>	<b>+0.60</b>	
Zimbabwe	1984	14.0	1988	10.0	Falling	-1.00	
<b>Near East and N. Africa</b>							(-0.6)
Egypt	1978	16.6	1988	10.0	Falling	-0.66	
<b>Egypt</b>	<b>1990</b>	<b>10.4</b>	<b>1992</b>	<b>9.4</b>	<b>Falling</b>	<b>-0.50</b>	
<b>Morocco</b>	<b>1987</b>	<b>12.0</b>	<b>1992</b>	<b>9.0</b>	<b>Falling</b>	<b>-0.60</b>	
Tunisia	1975	20.2	1988	7.8	Falling	-0.95	
<b>South Asia</b>							(-2.9)
Bangladesh	1981	70.1	1989	66.5	Falling	-0.45	
<b>Bangladesh<sup>3</sup></b>	<b>1990</b>	<b>71.0</b>	<b>1993</b>	<b>67.0</b>	<b>Falling</b>	<b>-1.33</b>	
India	1977	71.0	1988/90	63.0	Falling	-0.67	
<b>India<sup>4</sup></b>	<b>1988/90</b>	<b>63.0</b>	<b>1991/92</b>	<b>66.0</b>	<b>Rising</b>	<b>+1.00</b>	
Pakistan	1977	54.7	1990	40.4	Falling	-1.10	
Sri Lanka	1980	47.5	1987	36.6	Falling	-1.56	
<b>South East Asia</b>							(-1.6)
Indonesia	1986	51.0	1989	46.0	Falling	-1.70	
Malaysia	1983	25.6	1986	21.1	Falling	-1.50	
Myanmar	1982	42.0	1990	32.4	Falling	-1.20	
Philippines	1982	33.2	1990	33.5	Static	+0.04	
<b>Philippines</b>	<b>1990</b>	<b>33.5</b>	<b>1992</b>	<b>33.0</b>	<b>Falling</b>	<b>-0.25</b>	
Thailand	1982	36.0	1990	13.0	Falling	-2.88	
Vietnam	1987	515	1990	41.9	Falling	-3.20	
<b>China<sup>5</sup></b>	<b>1987</b>	<b>21.7</b>	<b>1990</b>	<b>17.5</b>	<b>Falling</b>	<b>-1.40</b>	<b>(-1.1)</b>

<b>Middle America/Caribbean</b>							(-0.8)
Costa Rica <sup>1</sup>	1978	16.0	1982	6.0	Falling	-2.50	
<b>Costa Rica</b>	<b>1982</b>	<b>6.0</b>	<b>1992</b>	<b>2.3</b>	<b>Falling</b>	<b>-0.37</b>	
El Salvador	1975	21.6	1988	15.5	Falling	-0.47	
Jamaica	1978	15.0	1985	14.9	Static	-0.01	
<b>Jamaica</b>	<b>1985</b>	<b>14.9</b>	<b>1989</b>	<b>7.2</b>	<b>Falling</b>	<b>+1.93</b>	
<b>Nicaragua</b>	<b>1982</b>	<b>10.5</b>	<b>1993</b>	<b>11.9</b>	<b>Rising</b>	<b>+0.13</b>	
<b>Panama</b>	<b>1980</b>	<b>16.0</b>	<b>1992</b>	<b>7.0</b>	<b>Falling</b>	<b>-0.75</b>	
Trinidad/Tobago	1976	16.3	1987	5.9	Falling	-0.95	
<b>South America</b>							(-0.4)
Bolivia	1981	14.5	1989	11.4	Falling	-0.39	
Brazil	1975	18.4	1989	7.1	Falling	-0.81	
<b>Brazil (NE)</b>	<b>1989</b>	<b>12.7</b>	<b>1992</b>	<b>9.2</b>	<b>Falling</b>	<b>-1.17</b>	
Chile <sup>6</sup>	1978	2.1	1986	2.5	Static	+0.01	
Colombia	1980	16.7	1989	10.1	Falling	-0.73	
<b>Peru</b>	<b>1984</b>	<b>13.4</b>	<b>1992</b>	<b>10.8</b>	<b>Falling</b>	<b>-0.33</b>	
Venezuela	1982	10.2	1987	5.9	Falling	-0.85	

Note: The purpose of this table is more to give prevalence *trends* than levels comparable across countries. Most prevalences given are of children 0–59 months, <-2 SDs by NCHS standards. In some of the recent cases, however, this indicator was not available and could not be estimated (e.g. 0–36 month age range, <80% w/a cut-off), in which case priority was given to deriving identically-defined prevalences comparable within country across time. This has minor effects on the estimated rates, in percentage-points per year (pp/yr), which are considered generally comparable across countries.

<sup>1</sup> These data not included in figure 2 as too old.

<sup>2</sup> Zambia 1990–1992, rural. In figure 2, period taken as 1985–1992 and rate calculated as 0.2 pp/yr.

<sup>3</sup> Bangladesh data for 1981/1989 from surveys, 1990/1993 from surveillance, thus levels not comparable but trends should be reliable.

<sup>4</sup> Data from: Karnataka, Maharashtra, Gujarat, Kerala, Tamil Nadu, Andhra Pradesh, and Orissa.

<sup>5</sup> 1987, nine provinces; 1990, seven provinces. Five provinces have data for both years; in these, the prevalence trend (weighted average by sample size) was -1.1 pp/yr.

<sup>6</sup> Not included in figure 2 as both prevalences approximately equivalent to NCHS prevalences

Again, South Asia has the largest task, starting with both the highest prevalences and massive population. Thus although the rate of improvement here is estimated to be fairly similar to that in other improving regions – with the possible exception of India recently – these rates are not enough to meet the halving-the-prevalence goals. The rate required (because the starting prevalence is so much higher) is almost twice that of elsewhere, at nearly three percentage points per year, compared with one and a half for Sub-Saharan Africa or South East Asia.

An important determinant of at least part of nutrition trends is likely to be the economic growth rate. In the Second Report (Vol. I, p.9), underweight prevalences were compared with *per capita* GNP levels, showing a steep (non-linear) slope at low GNP values; one of the models used (Vol II, p.111) showed significant associations with GNP (and GNP-squared). Prevalence *changes* versus GNP *changes* were also illustrated for these earlier data (pre-1990, Second Report, Vol II, p.3). The present prevalence trend data have been further examined in relation to economic growth. Comparing rates change of GDP *per caput* with rates of change in prevalence shows a moderately close fit – see Figure 2, discussed in more detail below. A first use of this relationship is to get some idea as to how generalizable prevalence data are, using the known GDP growth rates.

The question of how typical are the recent estimates is particularly important for Sub-Saharan Africa. Here there are eight recent national estimates available, but these only cover a minority of the population (in contrast, for example, to the data coverage in Asia). One approach is to compare these eight national GDP rates of change with the regional average. This is shown in Table 2. The average GDP changes for the eight countries was negative recently – probably the best comparison period is 1985–1992, when the rate was –0.2%. For Sub-Saharan Africa overall, the change during this period was –0.8%. Thus these countries were slightly better off, if anything, than the average for Sub-Saharan Africa in 1985–92. The overall conclusion would be that the nutrition situation in Sub-Saharan Africa probably deteriorated somewhat more, rather than less, than indicated from the eight countries with available data.

A further question is whether the trend in the early 1990s (1990–92) was worse than that in the late 1980s. Nutritional trends in Sub-Saharan Africa were estimated to be static in 1985–90 (Second Report, Table 1.2, p. 10), and as discussed above prevalences are thought likely to have increased in 1990–92. This is in line with the reduction in GDP growth in the region, from –0.4% per year in 1985–90, to –1.9% in 1990–92, as shown in Table 2. The nutritional trend probably worsened in the early 1990s in Sub-Saharan Africa.

The situation in South Asia depends on average largely on India, for which there are direct estimates for certain states indicating possible increasing prevalences. On the other hand in other areas of the world the underweight trends available for the early 1990s were generally similar to those in the late 1980s (as can be seen roughly from Table 1). In most regions the GDP growth rate improved after 1990 (except Sub-Saharan Africa, see Table 2). The conclusion from Tables 1 and 2 is that nutritional improvement outside Sub-Saharan Africa and possibly India probably continued into the early 1990s.

The comparison of underweight prevalences changes with GDP *per capita* annual growth rates, shown in Figure 2, has some important further implications, which can only be touched on here. The prevalence rate data are the same as those given in Table 1; a negative (i.e. reduced) prevalence means improvement. It is expected that rapid economic growth would be associated with improving nutrition, and this is observed – certainly for such countries as Thailand and Vietnam in the 1980s (points 28 and 29 in Figure 2), and also for those growing well but less fast such as Indonesia (23) and China (30). Other countries with positive economic growth rates generally show nutritional improvement – with considerable variation – but the relationship becomes more diffuse for country-periods around and below zero growth. In fact, the fit to these data is non-linear, with no significant slope around or below zero growth, then accelerating with increasing positive growth (see Model 1 in Figure 2). Interestingly, prevalence probably still decreases somewhat (about –0.3 pp/year) at zero growth.

Such results are consistent with earlier observations (e.g. Update Report, 1989, p.16) of an underlying long-term tendency to improvement – associated with such factors as increasing education and falling fertility – disturbed by shorter-term crises, which may be economic, political, environmental, or a combination of these. However, there is perhaps more pessimism now than before concerning what the real long-term nutritional trend is in Sub-Saharan Africa.

Although economic growth is a likely factor in nutritional improvement, the deviation from the rate expected is substantial and important. On a case-by-case basis, many of the points seen in Figure 2 to be improving faster than the average (for growth) seem plausible – e.g. Jamaica (34), Sri Lanka (22), Zimbabwe (12); similarly a number of notably deteriorating cases are well-recognized – e.g. Ethiopia (1), Madagascar (4), Rwanda (6). (Note that the data for India, 1989–92, point 20, are particularly tentative). Nonetheless, factors explaining the better-than-expected deviations should be examined systematically – for example are they related to social expenditures (health, education, etc.)? increased food security? – and preliminary observations outside the scope of this overview, indicate that this may be so.

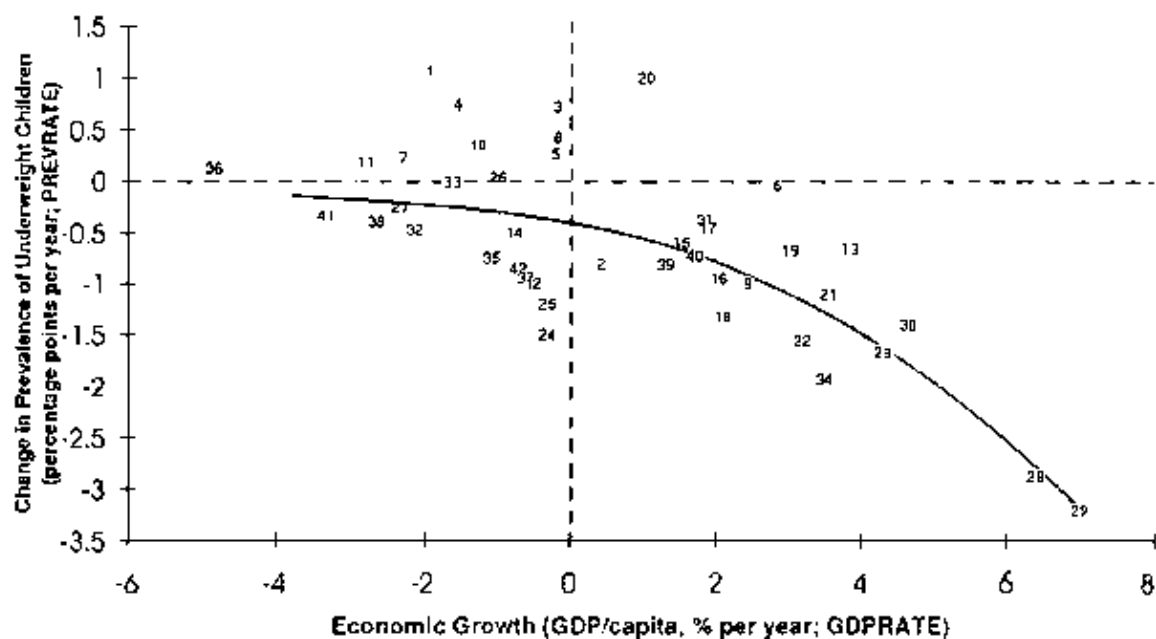


Figure 2. Plot of Change in Underweight Prevalence by Economic Growth Rate

<i>Country</i>	<i>From.</i>	<i>To</i>
1. Ethiopia	1983,	1992
2. Kenya	1982,	1987
3. Kenya	1987,	1993
4. Madagascar	1984,	1992
5. Malawi	1981,	1992
6. Rwanda	1976,	1985
7. Rwanda	1985,	1992
8. Senegal	1986,	1992
9. Tanzania	1987,	1992
10. Togo	1977,	1988
11. Zambia	1984,	1992
12. Zimbabwe	1984,	1988
13. Egypt	1978,	1988
14. Egypt	1990,	1992
15. Morocco	1987,	1992
16. Tunisia	1975,	1988
17. Bangladesh	1981,	1989
18. Bangladesh	1990,	1993
19. India	1977,	1989
20. India	1989,	1992
21. Pakistan	1977,	1990
22. Srilanka	1980,	1987

- 23. Indonesia 1986, 1989
- 24. Malaysia 1983, 1986
- 25. Myanmar 1982, 1990
- 26. Philippines 1982, 1990
- 27. Philippines 1990, 1992
- 28. Thailand 1982, 1990
- 29. Viet Nam 1987, 1990
- 30. China 1987, 1990
- 31. Costa Rica 1982, 1992
- 32. El Salvador 1975, 1988
- 33. Jamaica 1978, 1985
- 34. Jamaica 1985, 1989
- 35. Panama 1980, 1992
- 36. Nicaragua 1982, 1993
- 37. Trin/Tobago 1976, 1987
- 38. Bolivia 1981, 1989
- 39. Brazil 1975, 1989
- 40. Colombia 1980, 1989
- 41. Peru 1984, 1992
- 42. Venezuela 1982, 1987

**Model 1**

GDPR2 – (GDPRATE + 6)  
 PREV2 = –PREVRATE

$$PREV2 = 0.3547 - 0.1984 \text{ GDPR2} + 0.03148(\text{GDPR2} \cdot \text{GDPR2})$$

*(p = 0.22)*
*(p = 0.01)*

R squared = 0.56  
 F = 24.9  
 n = 42

**Model 2**

$$PREVRATE = -0.494 - 0.237 \text{ GDPRATE}$$

*(p = 0.000)*
*(p = 0.000)*

R squared = 0.47  
 F = 35.9  
 n = 42

Model 1 is equivalent to:  $PREVRATE = -0.2976 - 0.1794 \text{ GDPRATE} - 0.03148 (\text{GDPRATE} \cdot \text{GDPRATE})$

**Table 2 Real GDP/caput Annual Growth Rates (%), by Region**

Region <sup>1</sup>	1980–85	1985–90	1990–92	1985–92
---------------------	---------	---------	---------	---------



Sub-Saharan Africa	-2.1	-0.4	-1.9	-0.8
Near East/N.Africa	-1.0	0.6	1.1	0.9
South Asia	3.5	1.6	2.5	2.1
South East Asia	1.8	4.6	4.2	4.7
Middle America/Caribbean	-1.3	-0.5	1.3	0.2
S.America	-2.0	-0.2	1.4	-0.2
China	8.5	6.0	7.9	5.9

Source: Calculated from data in: World Bank (1994). *World Tables, Fall 1994 Update*. Washington, D.C. (Computer Disk)

Average for 8 countries with nutrition data up to 1992/93 in Sub-Saharan Africa: 1985-90, 1.0%; 1990-92, -3.5%; 1985-92, -0.2%.

Note: 8 countries/dates are: Ethiopia (83-92), Kenya (87-93), Madagascar (84-92), Rwanda (85-92), Senegal (86-92), Tanzania (87-92), Zambia (88-92).

<sup>1</sup> Regional groupings as defined in the Second Report on the World Nutrition Situation, see Vol.I, p.5, and Vol.II, pp. 102-104; the following countries were excluded because of unavailability of GDP data: Sub-Saharan Africa - Angola, Liberia, Somalia, Uganda; Near East & North Africa - Cyprus, Iraq, Jordan, Kuwait, Lebanon, Libya, Syria, United Arab Emirates, Yemen; South Asia - Afghanistan; South East Asia - Lao PDR, Kampuchea or Cambodia, Vietnam; Middle America & Caribbean - Cuba.

Interpretation is complicated by the fact that many countries with good economic performance are also able to support specific nutritional activities - Thailand and Indonesia are again examples of this. Thus more detailed investigation is needed to disentangle the relative effects of such different nutrition-relevant actions. The case-studies referred to in the Second Report (Vol. II, p. 120) gave some insights, indicating that economic growth (in part through increased food security), health and education, and community-based nutrition programmes all contributed to improving nutrition (Gillespie and Mason, 1993); moreover these could not substitute for each other, anyway in the long term.

The country case studies in Chapter 2 are intended to describe recent trends in nutrition. They provide some illustrations of important factors influencing these. Their selection was determined in part by the availability of new data to estimate trends, with particular stress on seeking new information for countries with large populations. Countries included are therefore not systematically selected as representing different situations, although they do in fact cover a range of these.

China and India were obviously important to include, having the largest populations overall, and India having the greatest numbers of underweight children. Bangladesh, with the highest national prevalence estimated in 1990, was included. Brazil was considered a priority for inclusion, due to its population size, although new data were only available for one region. Particular importance was attached to identifying national trend data in Sub-Saharan Africa, because of concern for deterioration. Eight estimates of recent trends were feasible, with important implications as discussed earlier.

The availability of nutritional data has improved to such an extent that it is increasingly feasible to assess trends, and indeed in future it will be more possible to focus selectively on countries of special concern and interest. For this report, 46 trend estimates (country-periods in 35 countries) were available; for the Second Report in 1992, 29 national trends could be assessed (Vol. I, p.11); and for the Update Report in 1989, in only around ten cases could trends be directly estimated. National data (observations at one point in time) are available now from over 100 surveys. The data, compiled by WHO, now usually include prevalences of stunting and wasting, as well as underweight (De Onis *et al.*, 1993), and greater use of these indicators can be foreseen. A number of important publications now regularly include these indicators, such as UNICEF's State of the World's Children and Progress of Nations (e.g. UNICEF (1994 a & b)), UNDP's Human Development Report (e.g. UNDP, 1994), the World Development Report (e.g. World Bank, 1994), and Bread for the World's Annual Hunger reports (e.g. Bread for the World Institute, 1994). These estimates and publications all use the same basic data, and are generally consistent with each other.

Chapters 1 and 2 in this report aim to give a recent picture of nutritional trends, to update the more detailed analysis in the Second Report, and to bridge the gap to the Third Report on the World Nutrition Situation, due in 1995.

Chapter 3 draws attention to the nutritional situation of refugees and displaced people, particularly in Sub-Saharan Africa. This population, rapidly increasing in numbers, is the most seriously affected by malnutrition in the world. Assessment of nutritional conditions, and efforts to improve these, should surely include the worst-off groups. The section draws on information from the two-monthly reports now issued by the SCN, in close collaboration with UNHCR, WFP, and many other organizations, especially non-governmental. Although individual situations vary rapidly – with improvements (such as Mozambique) as well as disasters like in Rwanda and Sudan – the trend in numbers affects, and in severe malnutrition, is ominous. Chapter 3 introduces the topic, gives some details of specific situations in Asia and Africa, and ends by summarizing the nutrition conditions for refugees and displaced people in Sub-Saharan Africa.

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## Chapter 2. Recent Nutrition Trends in 14 Countries

### Bangladesh

Bangladesh has a land area of 143,960 square kilometers and a population estimated at 117 million in 1993; it is among the world's most densely populated countries, with more than 740 people per square kilometer. The population is estimated to be growing at 2.1% per year. This intense population pressure on a relatively narrow resource base, together with the frequent natural disasters, presents formidable challenges to poverty

alleviation efforts in Bangladesh.

The nutrition situation in Bangladesh was previously reported by the SCN in the Update Report, 1989 (ACC/SCN, 1989, p. 106–111) and, with trends to 1990, in the Second Report on the World Nutrition Situation (vol.II, p.16–20; ACC/SCN, 1993).

### Recent Trends in Nutrition

Since 1990, trends in the nutritional status of children in Bangladesh were monitored through the Nutritional Surveillance Project (NSP), a collaborative effort by the Government and by NGOs, and coordinated by Helen Keller International. Every other month, the system collects nutrition and socio-economic data from 7,000 to 9,000 children between ages 6–59 months nationwide. These children are sampled from 5,000 to 7,000 households scattered over 26 sentinel points in the country corresponding to the 20 sub-districts and 4 slu-mareas in urban centers. The nutritional surveillance system is one of the most comprehensive system in existence, and the 24 rounds of data collected so far provide the most recent trends in the nutrition of the country.

Since data are available on a bi-monthly basis, trends in nutrition in Bangladesh could be related to important changes in the economy, public policy and natural disasters such as cyclones, which affect the country periodically.

Prevalences estimated as shown in Figure 1 indicate that the nutrition situation did not change much between 1990 and 1992, but improvements were observed in 1993. The bi-monthly trends in the prevalence of underweight children over the last four years (1990–1993) indicate strong seasonality effects. There are two main crops, one harvested in December (Aman) a second harvested in June (Boro). As shown in Figure 1, the proportion of underweight children rises during the period before the rice harvest and improves right after each harvest. The highest levels of underweight prevalence were observed around June to October just before the Aman crop harvest, and lowest around December to February/April, just after this harvest. Highest values in the last few years were 72–74% in 1990–1992, improving to around 70% in 1993. Lowest values were 69% in 1991–1992, falling to 65% in 1993.

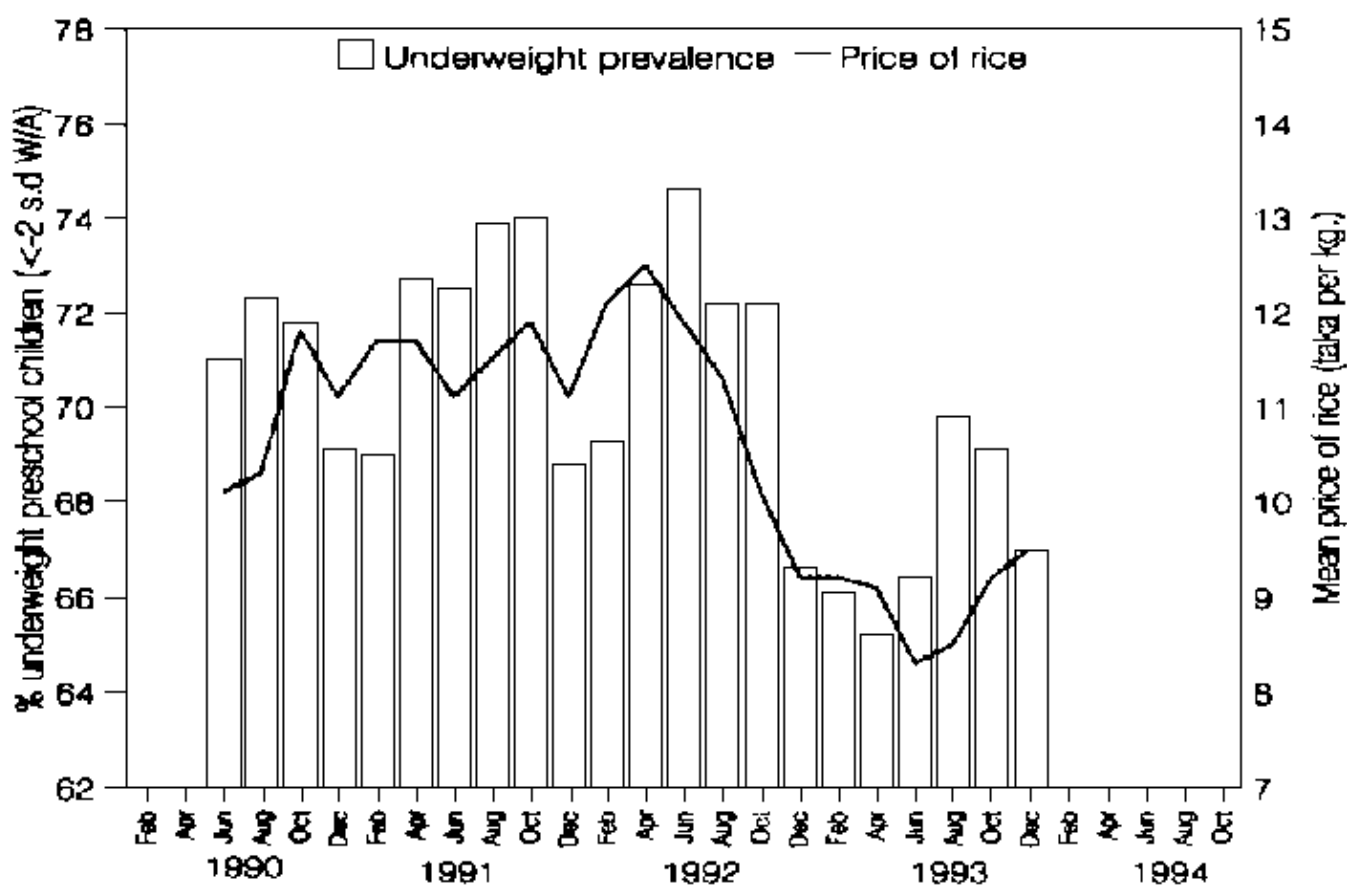
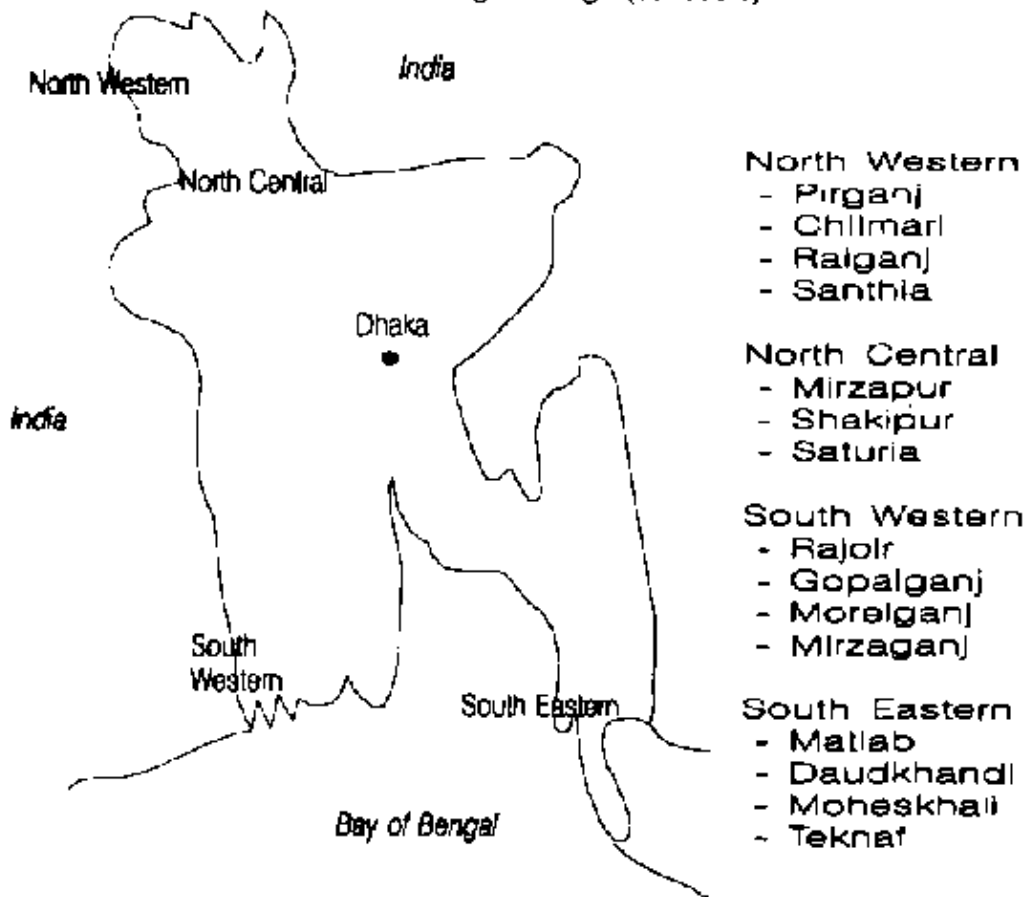
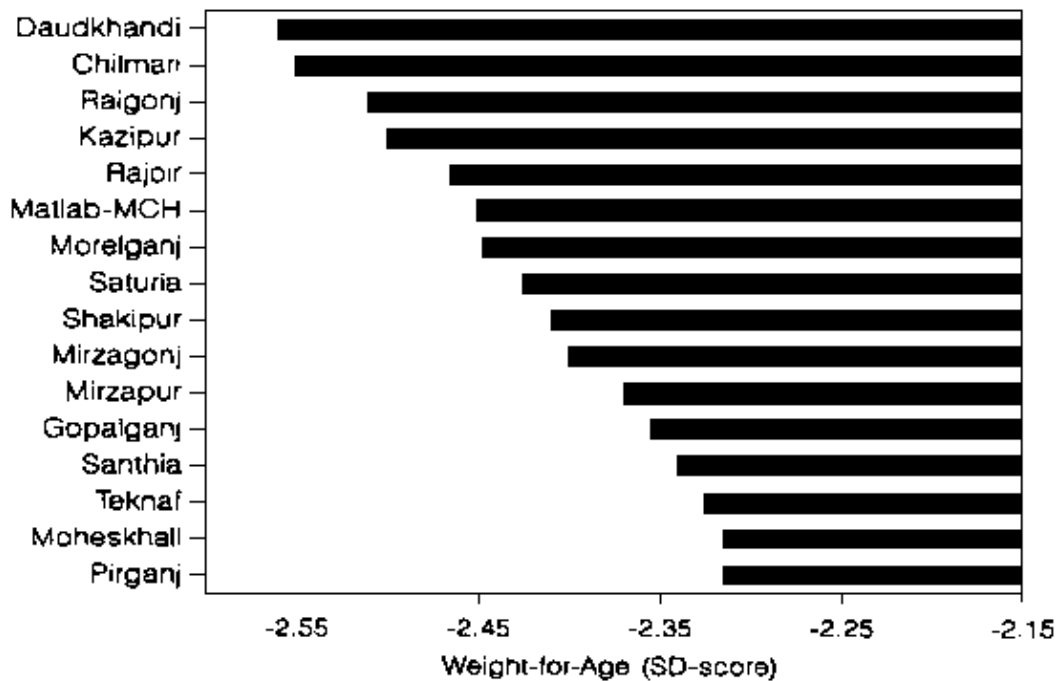


Figure 1. Bangladesh: Relationship Between Price of Rice and Prevalence of Underweight Children, June 1990–December 1993

Source: Bloem (1994).

Figure 1 also shows some correlation of underweight prevalences with rice prices, discussed further in the next section.

There are strong differences in regional nutritional situations. Figure 2 shows the mean SD score of weight for age of children 6–59 months by sub–district for the period between April 1990 to December 1993. Since this is an average of the entire period, the data provide a relative ranking of chronic nutrition problems. Thus, it is clear that the areas most in need include Daudkhandi, Chilmari, Raigonj, Kazipur, Rajoir, and Matlab, whereas the/better off areas of the country include Pirganj, Moheskhali, and Teknaf. The average SD score for the worst off areas are below  $-2.5$ , with over 85% of children in these areas underweight. An analysis of the NSP data for the 1990–1993 period indicates that the problems of malnutrition were observed to be highest amongst landless and marginal farmers, and farmers with small holdings (<2.5 acres).



**Figure 2.** Bangladesh: Underweight (mean Weight-for-Age SD-score) in Children Aged 6–59 Months by Sub-Districts, April 1990–December 1993

Source: Bloem (1994).

It should be noted that the data quoted here from the Nutritional Surveillance Project is not directly comparable in terms of levels of underweight with earlier national survey data quoted in the Second Report on the World Nutrition Situation Vol.II, p.16–20. The surveillance data are particularly useful in assessing short-term trends, whereas national survey data are usually more appropriate for estimating national prevalences at one point in time, and trends over periods of years.

#### Factors Affecting Trends in Nutrition

**Economic Factors.** With an estimated per capita GNP of US\$220 in 1993, Bangladesh is one of the lowest income countries of the world. Vulnerability to national disasters and heavy reliance on annual rains make Bangladesh economic growth erratic.

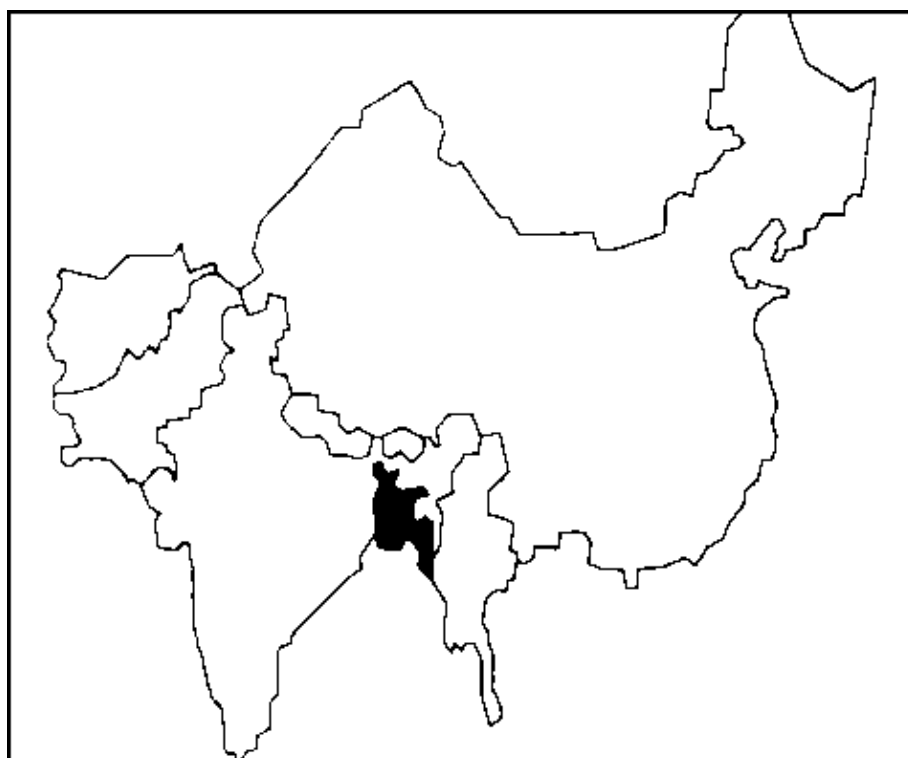
In 1992/93, agriculture accounted for 34% of GDP as compared to 40% in 1986/87. It provides employment for the majority of the workforce and, in many rural areas, is the only source of employment. About 60% of person-hours worked in Bangladesh are spent in agricultural production, and mostly in rice production.

Despite the country's erratic climate, agriculture has been the principal driving force of economic growth, particularly as large sectors of industry rely on the crop and fisheries sectors as a source of inputs. Recent signs of stagnation in agricultural growth have, therefore, serious implications for overall growth prospects.

The economy is heavily dependent on foreign aid. Bangladesh has a low rate of national savings – only 6.4% of GDP in FY91, and 8.3% in FY92; foreign earnings were 4.0% of GDP in FY91, and fell to 2.2% in FY92, of which overseas worker remittances accounted for approximately half. Investment in the economy remains at the low level of 11% relative to GDP. Despite these structural weaknesses in the economy and repeated disruptions by natural disasters, Bangladesh has made significant economic progress over the past decade. Stabilization policies reduced external and fiscal deficits, reduced the inflation rate, promoted non-traditional exports, and achieved a modest growth rate. The inflation rate fell to 5% in 1992, the lowest rate in more than 10 years.

**Food Security.** The overriding objective of agricultural policy and development efforts in Bangladesh is to achieve self-sufficiency in foodgrains. Foodgrain output has risen, but self-sufficiency remains elusive. Rice output has tended to increase, but suffered from the 1987/88 floods and subsequent drought. In 1989/90, the crop reached a record 17.9 million MT, a figure matched in 1990/91, and exceeded in 1991/92 with a new record of 18.3 million MT – due primarily to a bumper boro harvest, which was up by 7% to 6.8 million MT. The per capita food production index has increased from 96 in 1986 to 110 in 1993 (base is 1979–81=100).

To ensure an affordable food supply for poor consumers, the government manages a variety of food distribution programmes and open market sales operations to help stabilize foodgrain prices. The objectives of price stabilization policies are to protect poor consumers from sharp price increases, protect poor farmers from a postharvest price collapse and achieve foodgrain self-sufficiency. Public food distribution programs provide approximately 13% of all foodgrains consumed in the country.

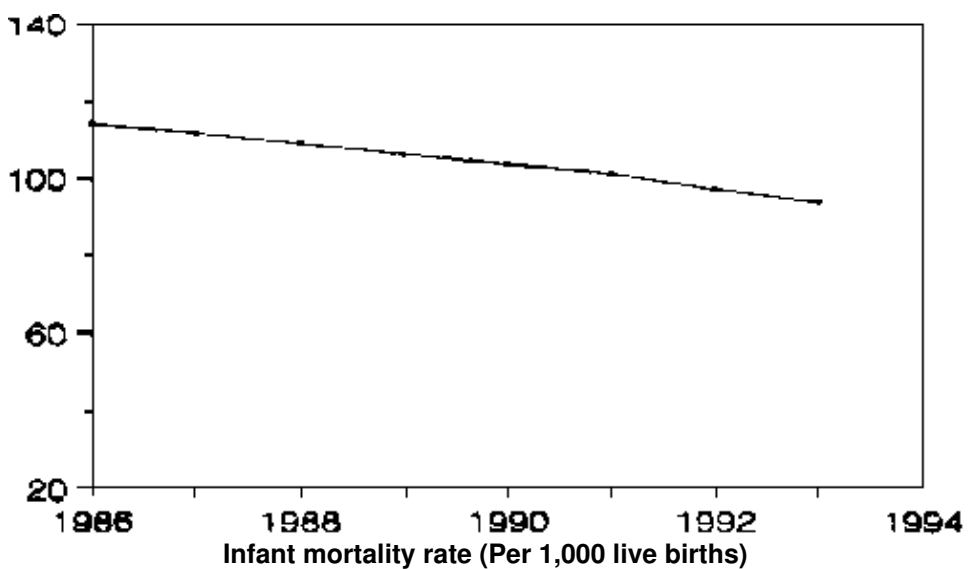
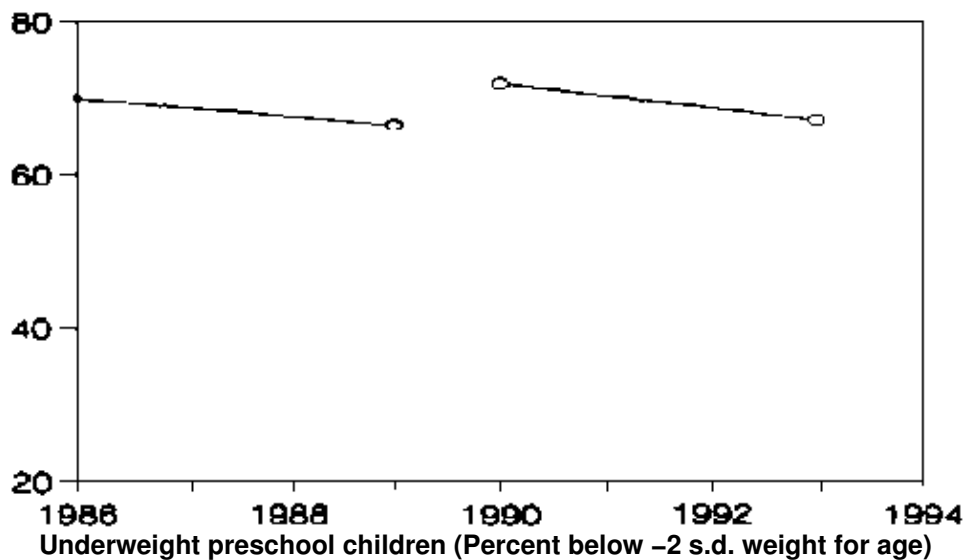


**BANGLADESH**

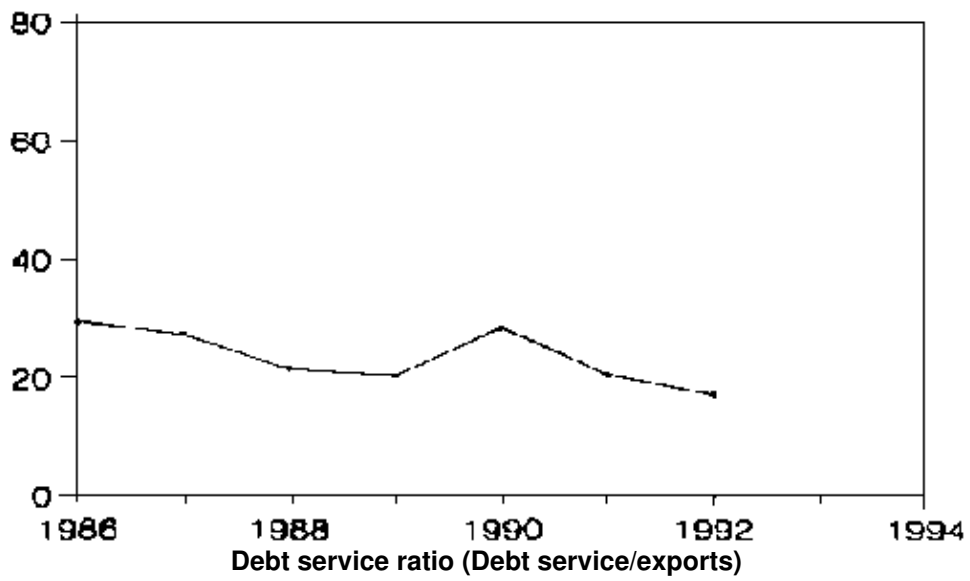
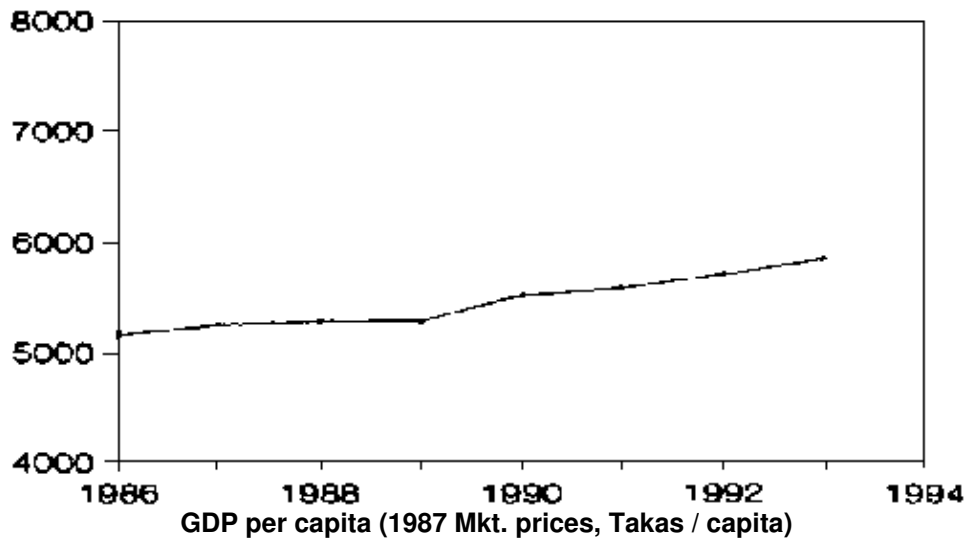
(Estimates in 1993)

Population : 117 million  
 Population Density : 779 per sq. km.  
 Population Growth Rate : 2.0% per annum  
 Urban Population : 18%  
 IMR : 94  
 GNP US\$ (Per Capita) : 220  
 (WB Atlas Methodology)  
 PPP estimates of GDP : 1160  
 (\$ Per Capita, in 1991)

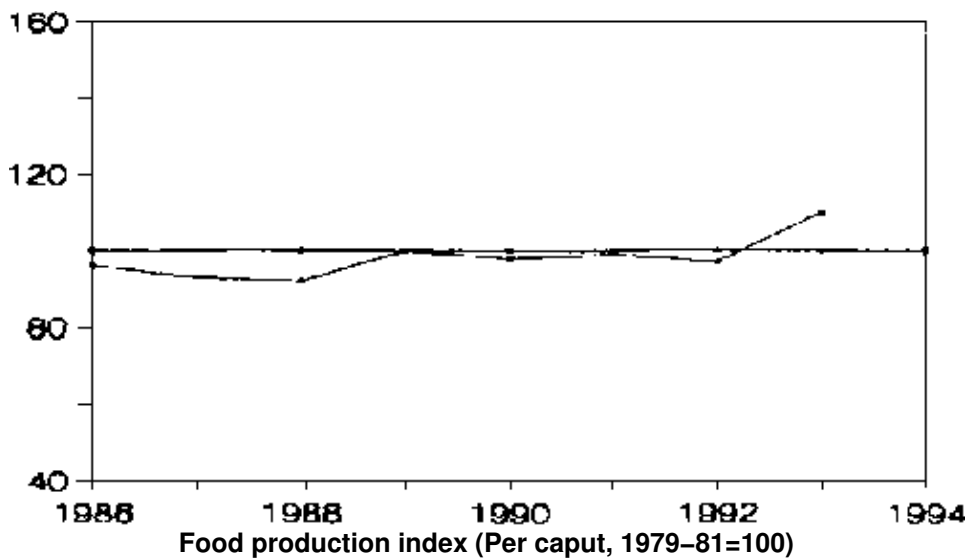
**CHILD GROWTH AND SURVIVAL**



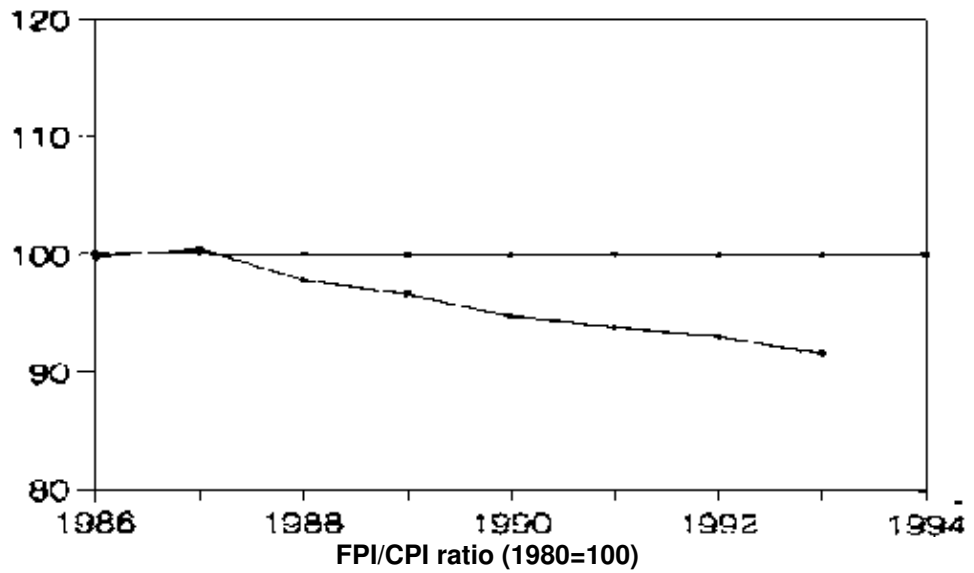
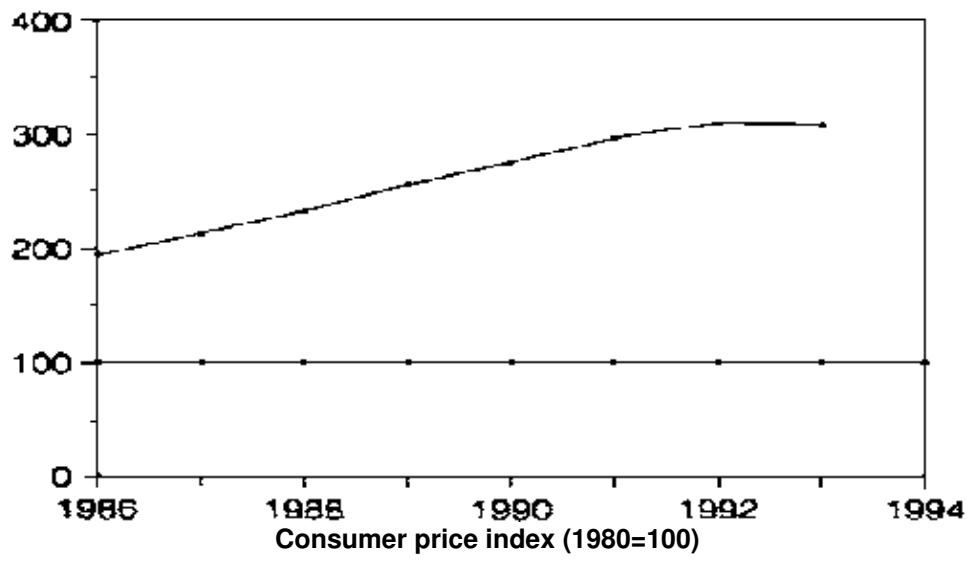
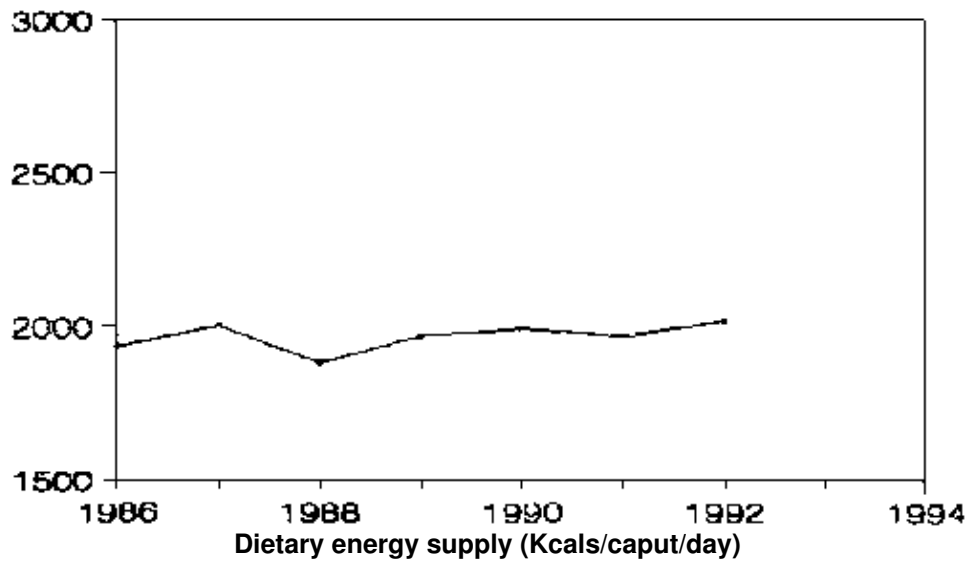
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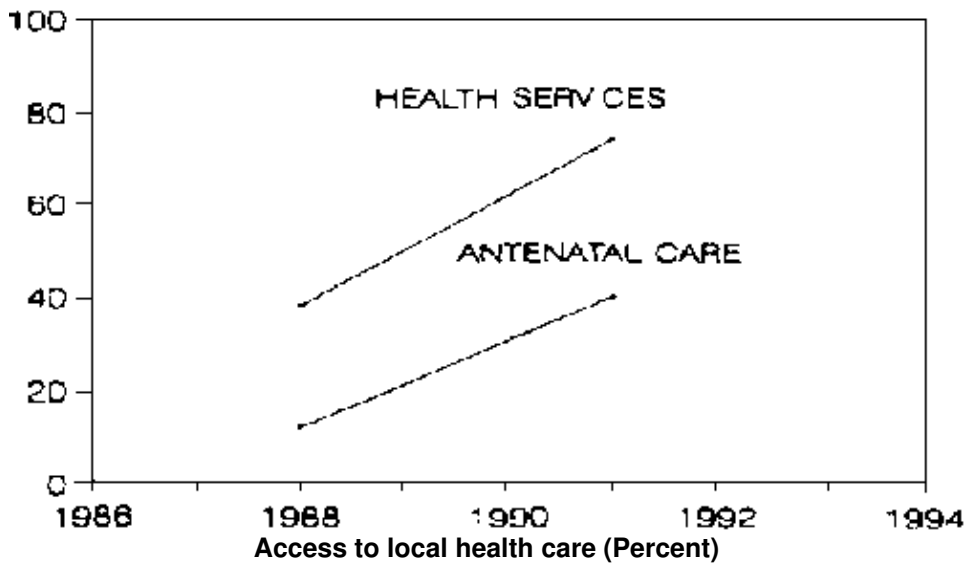
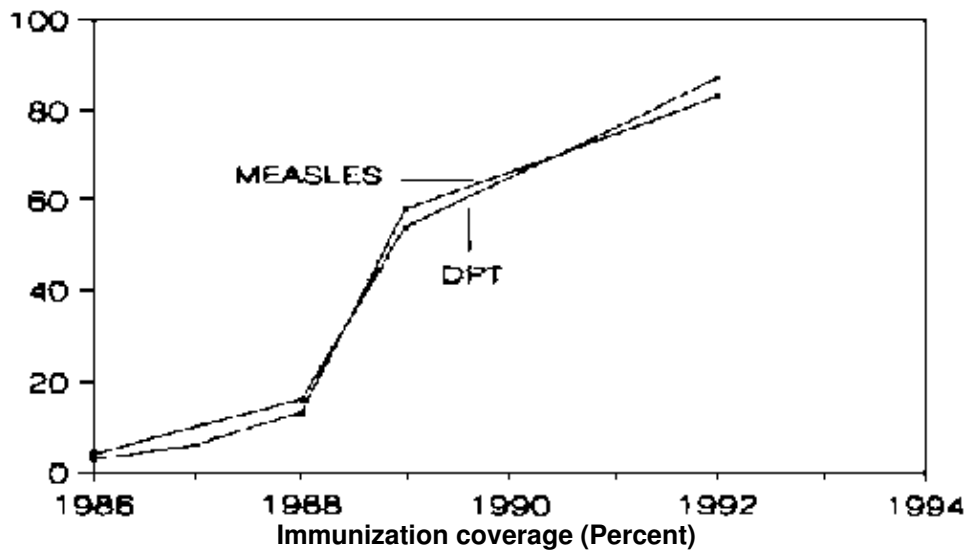
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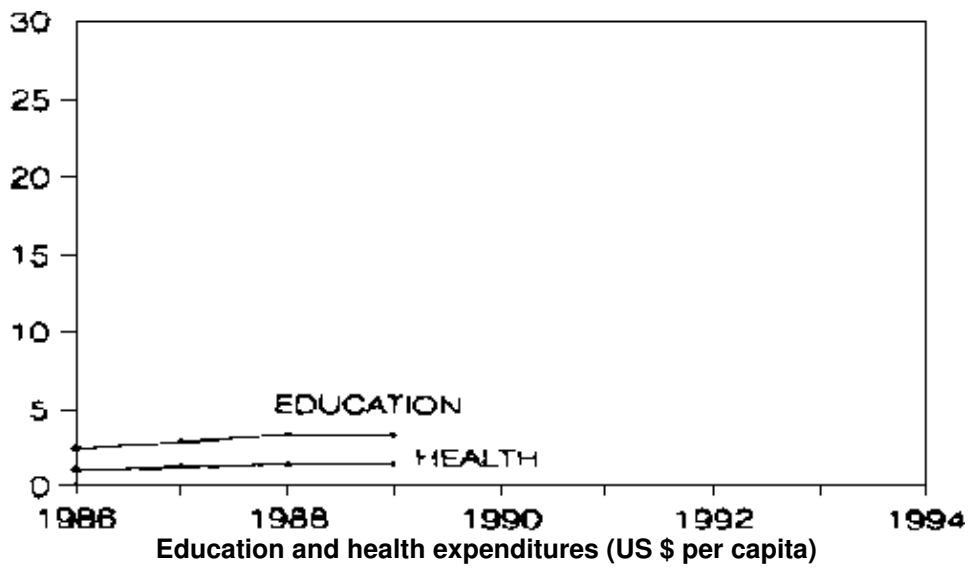


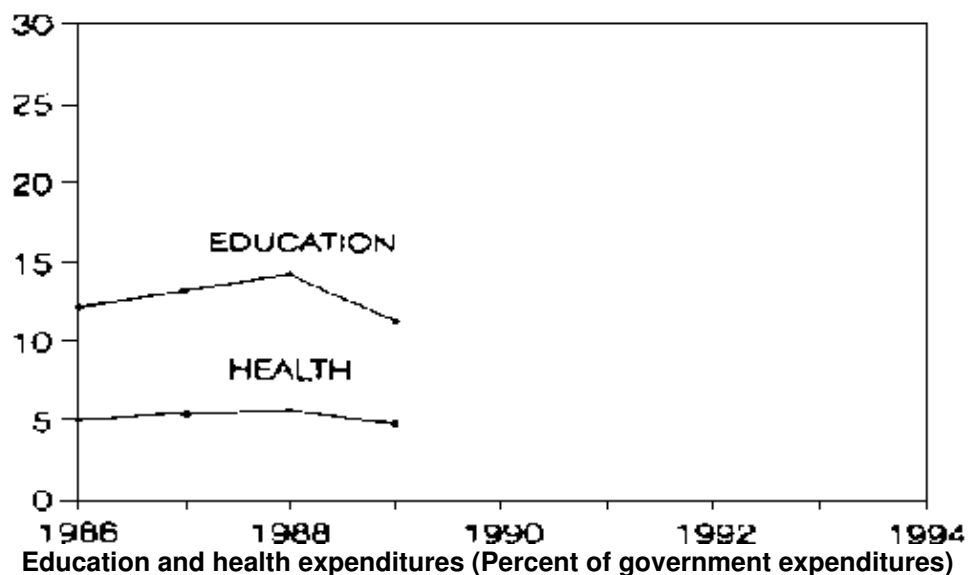


HEALTH



**PUBLIC EXPENDITURES**





The public food distribution programmes (PFDS) include disaster and famine relief, seasonal food-for-work development projects and year-round rationing.

Many food distribution programmes and food policies have recently been restructured, reformed or eliminated. For example, in August 1992, the government allowed private sector imports of foodgrains for the first time. In May 1992, the government abolished the rural rationing programme because of the high costs of maintaining it (an estimated \$60 million per year) and large leakages (between 70% and 100%). The rural rationing programme had provided an outlet for half of all government rice stocks. Its elimination resulted in a large buildup of government stocks and prompted several additional reforms in procurement policies.

**Effects of Falling Rice Prices.** Surveys by IFPRI indicate that roughly 85% of households are net purchasers of rice. Rice accounts for 40% of total spending by rural households in Bangladesh. Because of this, the price of rice is a powerful determinant of real income, consumption, and nutrition of the poor. This is clearly demonstrated in Figure 1 by the strong association of the trends in prevalence of underweight children from the nutritional surveillance data and the average price of rice during the period from 1990 to 1993. As shown in the graph, there are strong seasonal and interannual correlations between the price of rice and malnutrition.

The effect of changes in food price on food consumption and nutrition was also independently confirmed in another survey carried out by IFPRI during the same period in various areas in the country. The 20% fall in rice price from the lean season of 1991 to the lean season of 1992 offers a rare window for viewing the effects of rice price on consumption and nutrition of the same households. The surveys found that the 20% fall in the price of rice increased household consumption of rice by 38%, as well as other foods such as milk, meat, and eggs. Overall calorie consumption improved on average by 12% (10% for adults, 20% for children under 5).

## Conclusions

Food security indicators in Bangladesh have improved steadily over the past several years. However, Bangladesh's per capita income has remained stagnant as efforts to reduce widespread poverty meet substantial obstacles. Access to health services and antenatal care is increasing, although per capita government expenditures are among the lowest in the world. Calorie availability in Bangladesh was estimated to be 2019 in 1992, as compared to 1936 kcal/caput/day in 1986.

GNP per capita, per capita calorie availability, under-five mortality rate, foreign exchange earnings per capita, and domestic food production per capita nonetheless indicate that nutrition in Bangladesh is improving, particularly in the last year (1993), in line with the nutritional surveillance results.

## Brazil

Brazil had a population of 156 million people in 1993, which is the largest in South America and the fifth largest in the world. The population growth rate during the period 1985-93 was 1.8% per annum. New data are only available for the Northeast, which has the worst nutrition problems, so nutritional results focus on this

region.

Nutritional trends up to 1989 were reported by the ACC/SCN in the Second Report on the World Nutrition Situation (vol.II, p.74–79, 1993), and in "The Improvement of Child Nutritional Status in Brazil: How Did It Occur?" (Lunes and Monteiro, 1993).

### **Recent Trends in Nutrition**

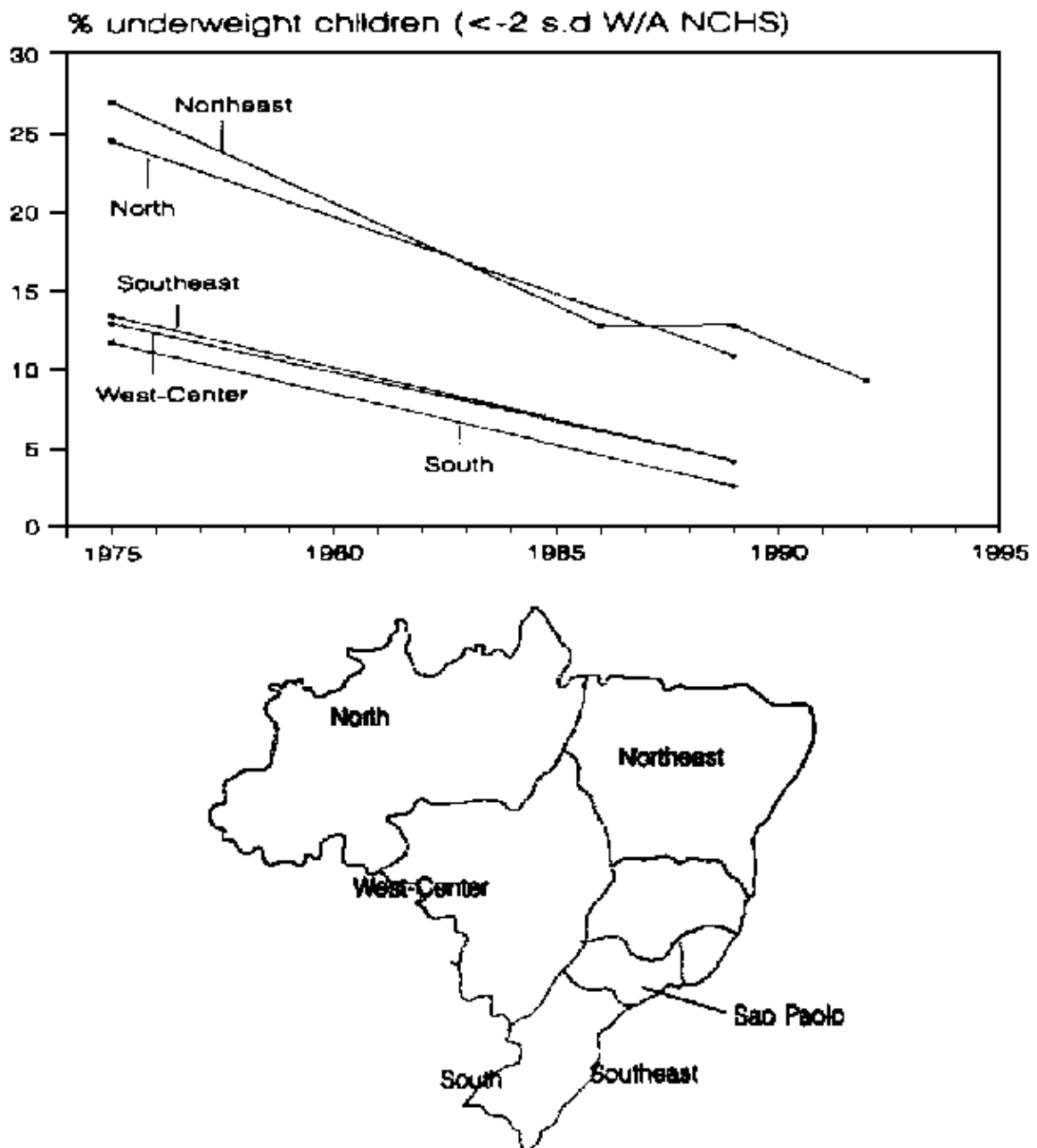
Results from nationwide nutrition surveys amongst preschool children carried out in 1975 and 1989 were previously given in the Second Report on the World Nutrition Situation. In the Northeast Region where the underweight prevalences were relatively high, two other surveys were undertaken separately—one in 1986 through the Demographic and Health Surveys and another in the period from 1989 to 1992 conducted by a group from Universidad Federal de Pelotas.

Estimated trends for the regions in Brazil from the 1975 and 1989 surveys are depicted in Figure 1. Data for the Northeast region for 1989 and 1992 are also plotted.

In 1989, the national prevalence of underweight children ( $<-2$  s.d. weight-for-age NCHS) in Brazil was estimated at about 7.1%, which was a major reduction from 18.4% in 1975. Similarly in the Northeast region, there was a decline in the prevalence of underweight children from 27% in 1975 to 12.7% in 1986. Despite these improvements, however, the child nutrition problems in the Northeast Region are still much higher, on average, than the other regions. The prevalence of 12.7% in 1989 was more than three times the rates in the South and West Center regions of the country.

The 1989–1992 surveys in the Northeast Region had a large sample size (11,890 children) and could be disaggregated to provide a statistically meaningful sub-regional breakdown. The results by state indicate wide variations. For example, the prevalence in the states of Maranhao and Piaui (18% and 12%) are about two to three times higher than other states within the region. The better-off states had rates of about 6%, similar to the other regions of the country.

A severe drought affected the Northeast Region in 1993, the worst in 60 years. There are reports of a continuing food shortage and serious malnutrition. However, no nutrition surveys are available to verify the extent of the problem. The government authorized duty free imports of maize to the Northeast Region until the end of February 1994. An emergency assistance program has been implemented, which is targeted to 6 million people (about 1.2 million families) in the area, representing half of the affected population.



**Figure 1.** Brazil: Prevalence of Underweight Children, (0–59 months) by Region, 1975–1992

Sources: Monteiro et al (1992) and Victora et al (1993).

### Factors Affecting Trends in Nutrition

**Economic Growth and Food Security.** Brazil's GNP per capita in 1993 was estimated at U.S.\$3,010. The growth rate in per capita GDP was negative between 1986 and 1993, declining by  $-1.45\%$  per year. The overall picture of income change in the country in the period between 1989 and 1993 was strongly influenced by major macroeconomic policy changes.

In March 1990 the government introduced a bold stabilization program involving temporary confiscation of about 70% of the assets of the financial system, and an array of policies for restructuring the economy by reducing the government's role and intervention. The government also introduced significant structural reforms in trade liberalization, deregulation, and privatization. The adoption of a new constitution in 1988 also had a major impact on economic management, as it reversed the trend towards a highly centralized state favored by the military to one of decentralized activities, particularly at the municipal level.

The complicated economic and political environment depressed private consumption outlays and caused investment expenditures to drop to slightly less than 15% of real GDP. Real value added in the key manufacturing sector plummeted to 4.9%. This contraction was heavily concentrated in the metropolitan Sao Paulo area—Brazil's industrial heartland—where business failures reached record levels. At the same time, the

average unemployment rate in the region jumped to an unprecedented 14.9%. Most of the increase was accounted for by low-skilled workers as enterprises attempted to cut costs. By mid-1992, industrial employment was 9% lower than in 1985; some 12.3 million workers, or about one-fifth of the economically active population, were only marginally employed, mostly in Brazil's burgeoning informal sector.

High interest rate policies were implemented to combat escalating inflation caused primarily by the nation's large fiscal imbalance. The average annual inflation rate during the period 1980-92 was 370%. It was realized that monetary policy by itself would not be sufficient to reverse inflationary expectations.

In 1987 inflation began an explosive cycle. Independent studies indicate that between 1986 and 1989, the proportion of the population below the poverty line rose from 24% to 38% nationwide, while those in the Northeast Region increased from 44% in 1985 to 60% in 1989. The latest data indicate that the rate of inflation was much lower between 1990 and 1992 compared to 1989 and 1990, but still the CPI grew at extremely high rates (1,008% in 1992).

However, inflation rates for food were generally lower than that of the non-food items in the household budget. No changes in calorie supply per capita were observed between 1986 and 1990, which was above 2700 kcals per day. These figures were about 100 kcals per day higher compared to the first half of 1980s. Calorie supply rose somewhat in 1991 and 1992 as compared with 1986-90.

**Health, Education.** It is likely that the resumption in improvements in nutrition between 1989 and 1992 was attained by the maintenance of the same levels of fiscal expenditures for health and education in the face of macroeconomic adjustments. Trends in absolute spending on health in fact increased from about \$32 in 1986 to \$76 in 1989 and \$72 in 1990. These are about 7% of the total government budgetary expenditures.

Immunization of infants accelerated between 1989 and 1992, from a coverage level of about 58% to 80% for DPT and from 62% to 83% for measles. This is an important milestone given the big infant and 0-4 year old child population, estimated at 18 million. The immunization program is also one of the primary reasons for the continuing decline in infant mortality rates, estimated at 52 per 1000 live births in 1993, compared to 62 in 1986.

## **Conclusions**

Brazil experienced major declines in the prevalence of underweight children between the mid-1970s and late 1980s. However, prevalence rates have remained relatively high in the Northeast region as a whole. Nevertheless, there is a great deal of variation in prevalence rates across states in the Northeast region; prevalence rates in some states are similar to those in the rest of the country. Although the prevalence of underweight children declined in the Northeast region from 27% in 1975 to 13% in 1989, a severe drought in 1993 may have reversed the downward trend more recently. Contributing to the general trend for nutritional improvement in the country as a whole are somewhat better calorie availability, an increased rate of immunization for children, and generally increased expenditures for health.

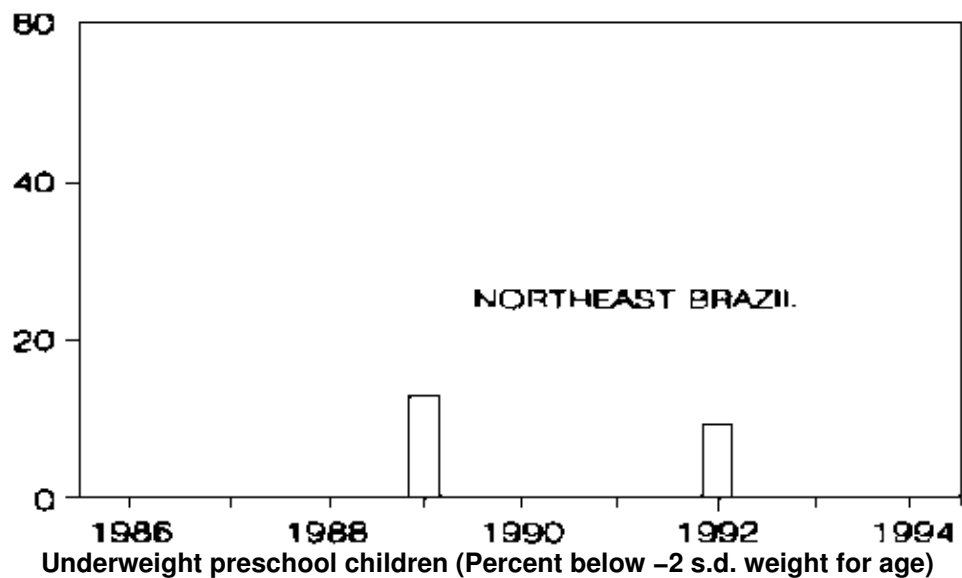


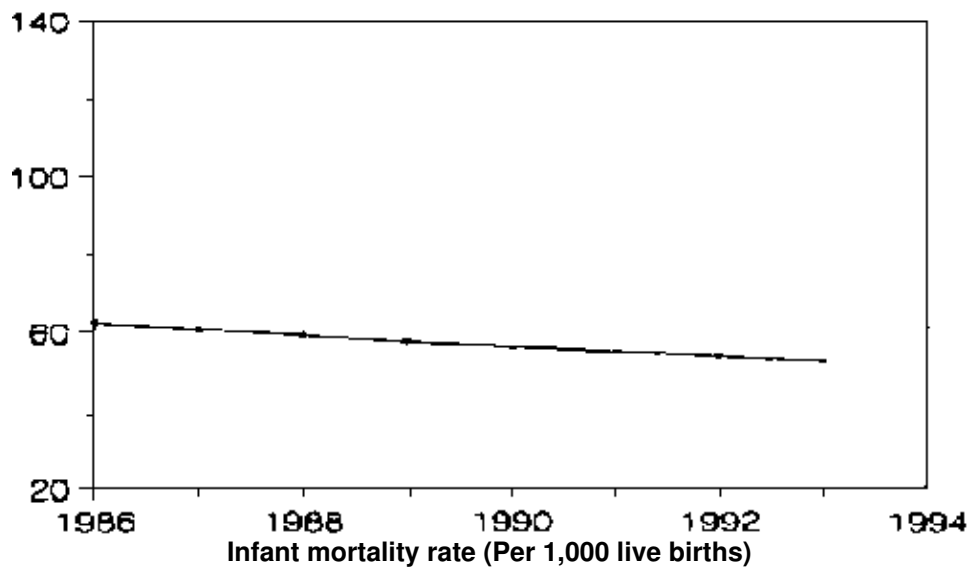
**BRAZIL**

**(Estimates in 1993)**

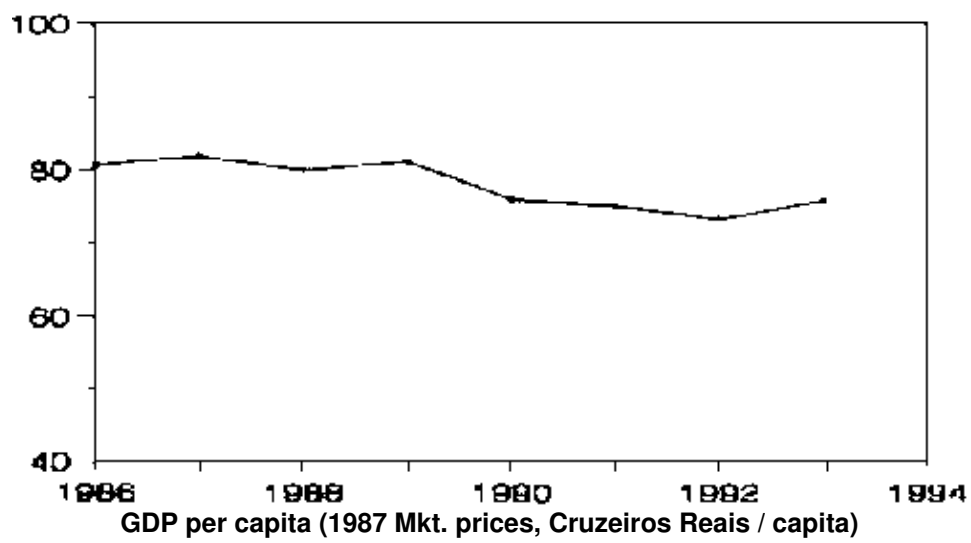
Population	: 156 million
Population Density	: 18 per sq. km.
Population Growth Rate	: 1.6% per annum
Urban Population	: 77%
IMR	: 52
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 3010
PPP estimates of GDP (\$ Per Capita, in 1991)	: 5240

**CHILD GROWTH AND SURVIVAL**



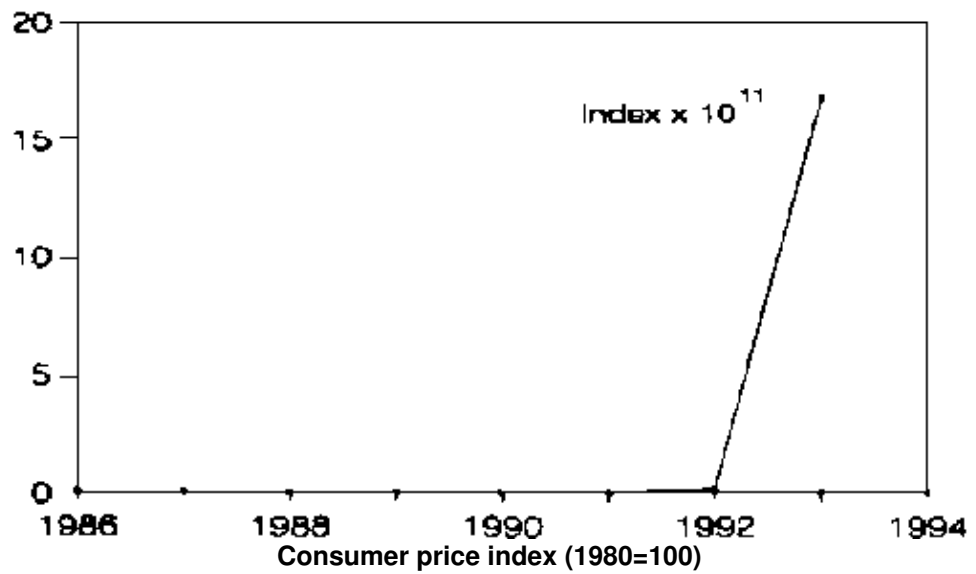
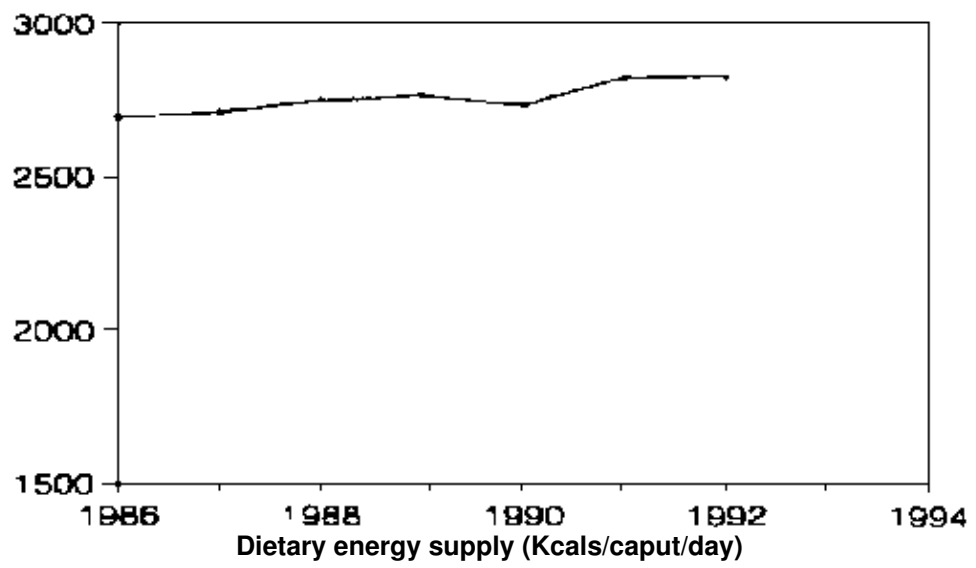
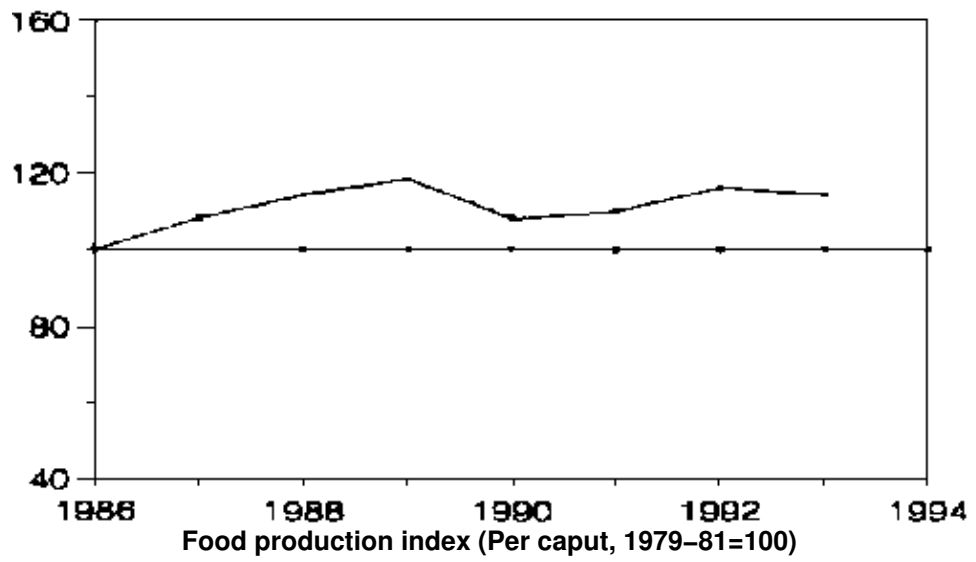


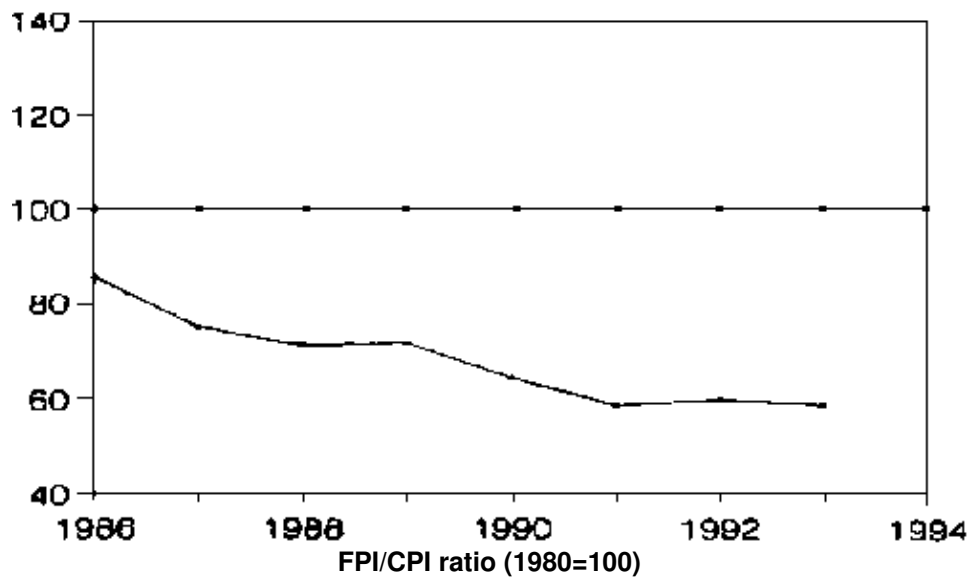
**ECONOMICS**



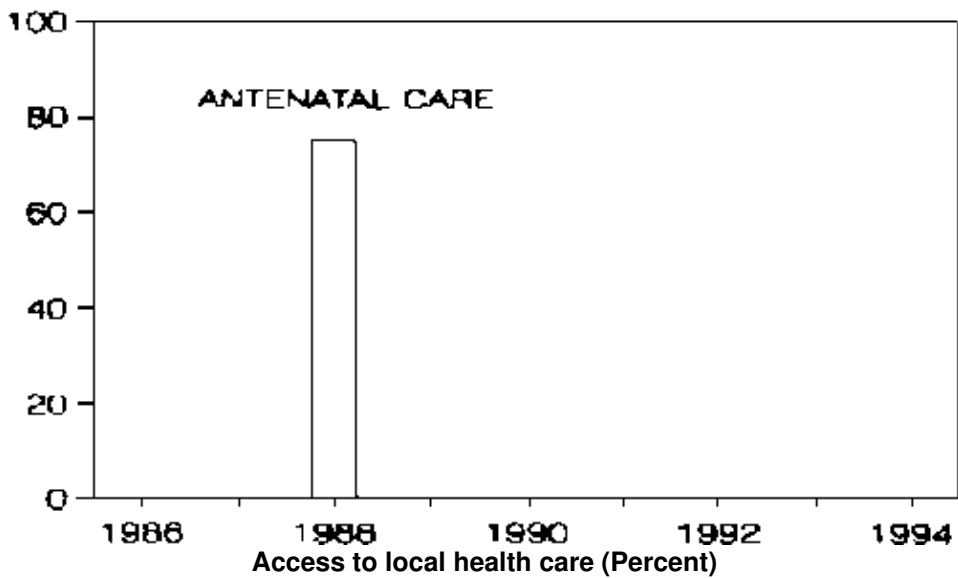
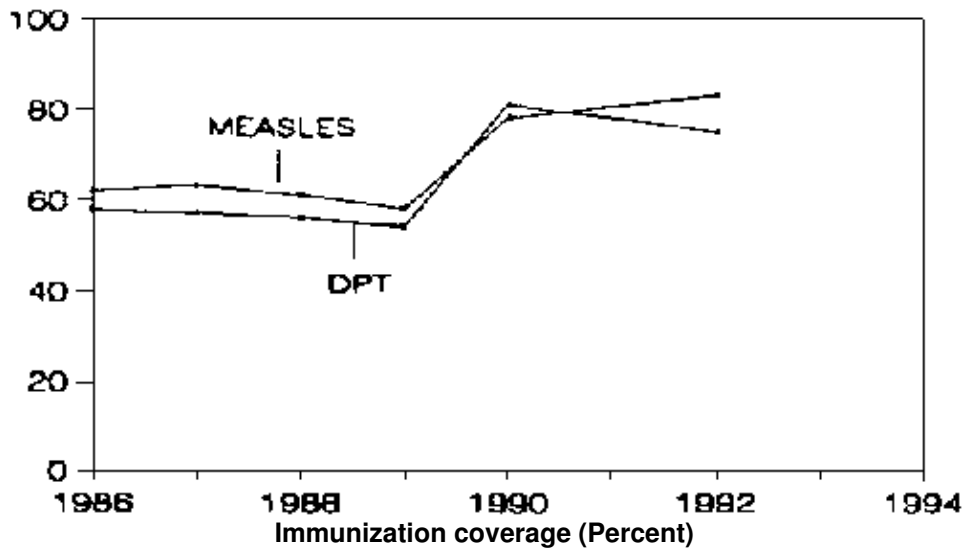
**FOOD**



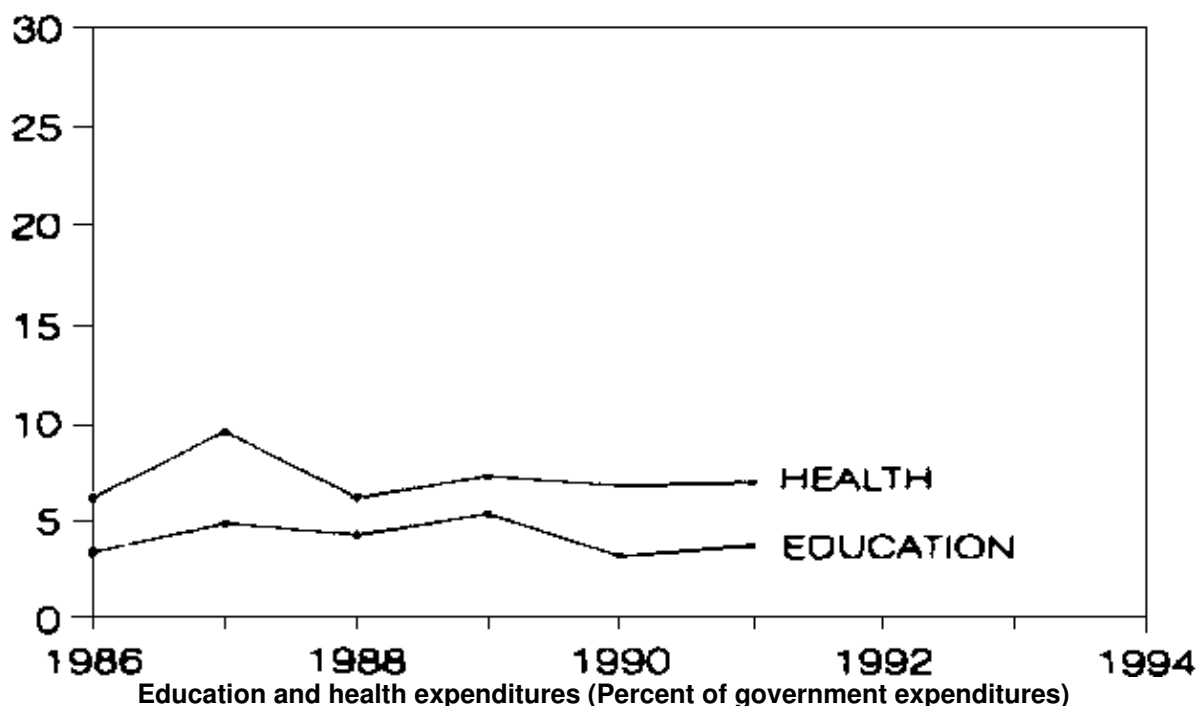
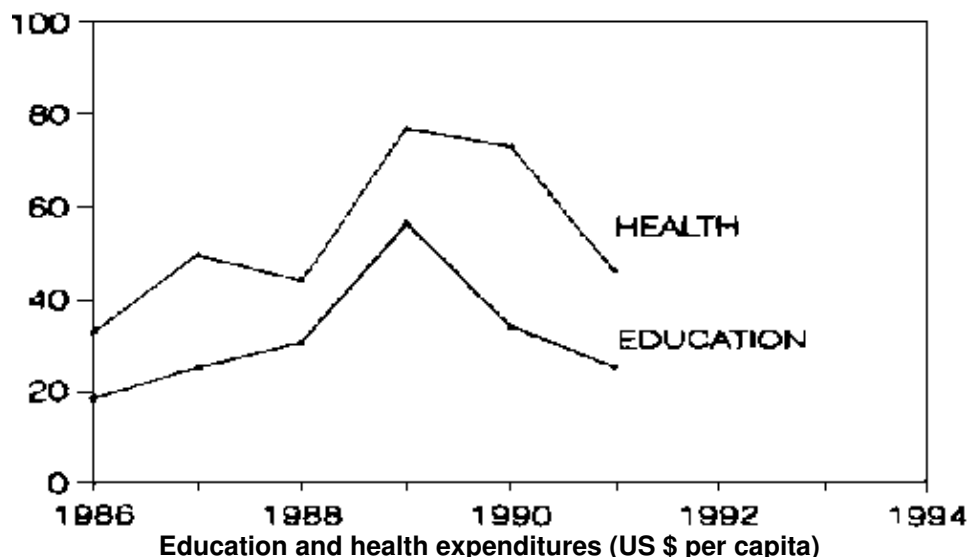




HEALTH



PUBLIC EXPENDITURES



## China

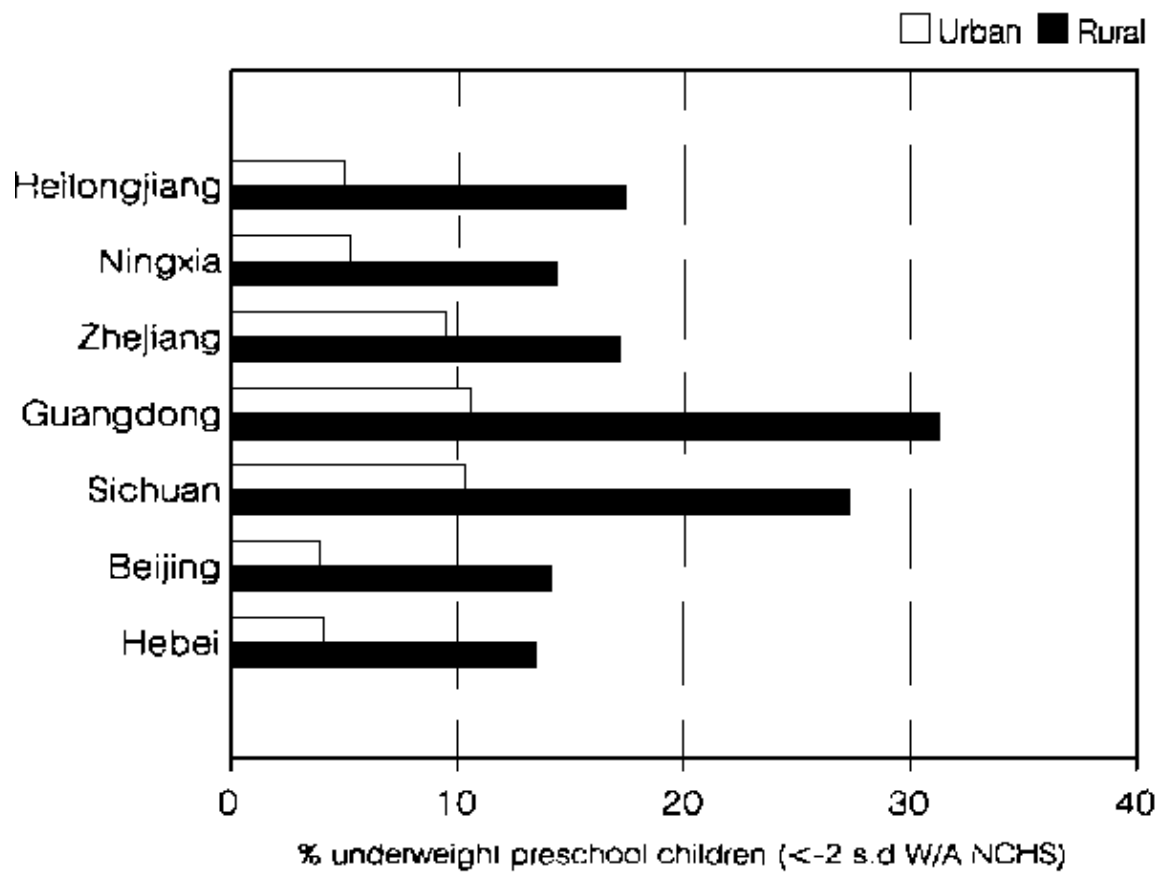
China was estimated in 1991 to have a population of 1.16 billion, the largest in the world, with an annual growth rate between 1980 and 1991 of 1.5%. Over recent years China has had accelerated economic growth. Between 1986 and 1993 per caput GDP grew in real terms at an average rate of 6.4%.

Nutrition trends were previously reported in SCN's 1989 Update on the Nutrition Situation (ACC/SCN, p.112–115, 1989), and in the Second Report on the World Nutrition Situation (vol.I, p.30–33, 1992).

### Recent Trends in Nutrition

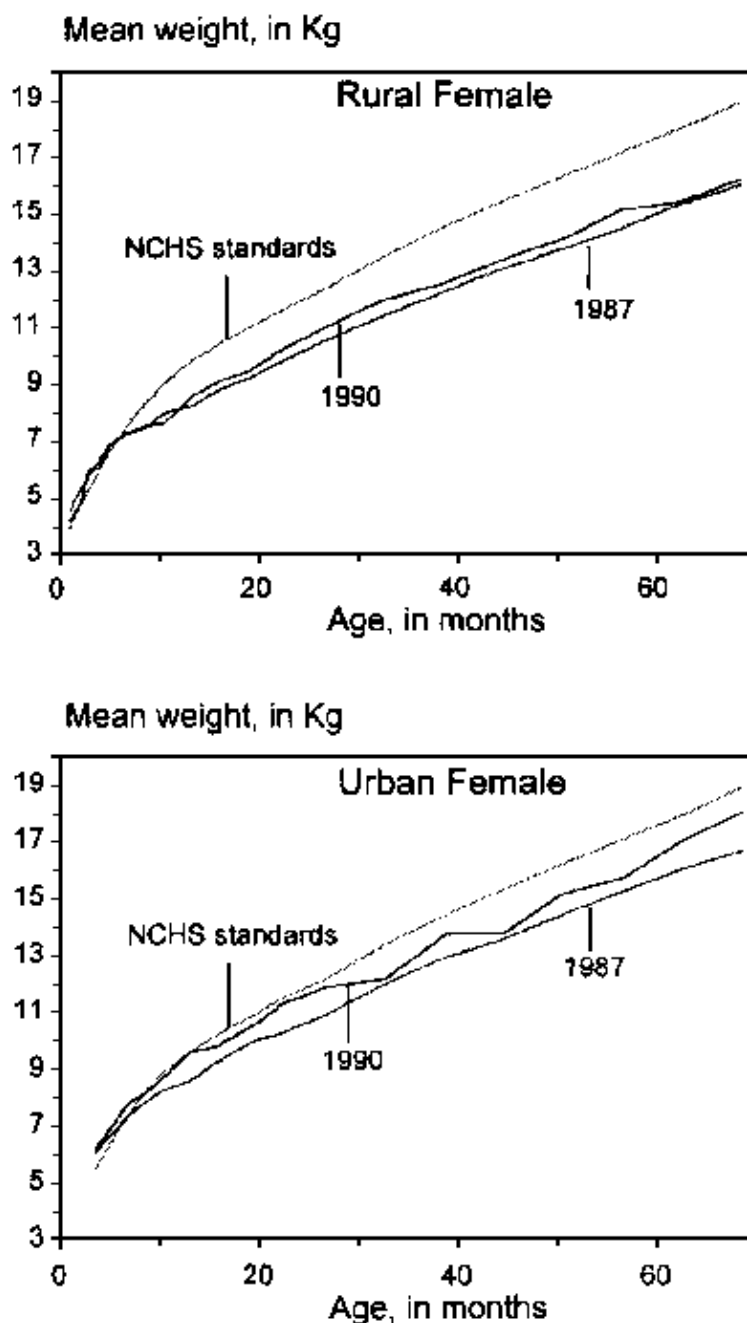
With its large population, conclusions regarding trends must differentiate between urban and rural areas and between regions. Recent data based on surveys of the nutrition of children and adults in China have recently become available. Anthropometric data on children based on surveys in 1990 were recently reported, and are generally comparable to an earlier survey in 1987, the first ever to cover much of the country. More recent nutrition surveys were carried out in 1992, but results are not yet available. Anthropometric data for adults were also made available comparing results from 1989 and 1991 from nutrition surveys in 8 provinces.

**Child Nutrition.** The general conclusion from data for young children (0–71 months; see Figure 1) indicates improvements mainly in the growth of children in the urban areas, with the situation in rural areas remaining static. While the prevalence in underweight children ( $<-2$  s.d. weight-for-age NCHS) in urban areas improved from 12.8% in 1987 to 7.1% in 1990, the proportions in the rural areas remained fairly constant at 23.9% in 1987 to 21.2% in 1990. In Guangdong, a coastal province where rapid economic growth in incomes was observed, improvements were seen in both urban and rural areas, but more dramatically in the urban areas (from 22.1 to 10.6%). The urban areas of Sichuan (largest province with 109 million population in 1990) likewise experienced dramatic improvements in the growth of children (19.8% to 10.4%), but stayed nearly the same in the rural areas (29.3 to 27.3%). In the urban areas of Heilongjiang, prevalence of underweight declined from 8.0% to 5.0%, but in rural areas there seemed to have been a slight deterioration from 14.0 to 17.4% between 1987 and 1990.



**Figure 1.** China: Prevalence of Underweight Children, (0–71 months), 1990, by Province

Source: Shen et al (1992).



**Figure 2.** China: Mean Weights of Urban and Rural Children, 1987 and 1990

Source: Shen et al (1992).

The overall picture of changes in nutrition in children in rural and urban areas can be seen from the comparison of the mean absolute weights of children by age group (see Figure 2). These are compared with the international NCHS growth standards. Three important findings can be made from these comparisons. First, in 1990, growth of younger children (0–30 months) in urban areas approximates the international NCHS growth standards, but deficits are seen at ages above 32 months. This phenomenon, occurring in urban areas, indicates the rapidly changing picture of child nutrition in China. For rural children, the deficit is larger and starts much earlier, at about 6 months, and the gap increases with age.

The second important trend is that the mean weights for urban children in 1990 is clearly higher than the mean weights of children in 1987, and this is true for practically all age groups. This indicates that improvements were more or less homogeneous and that the entire distribution in growth shifted to the right—which means that the majority of children were better off. The mean weights in the rural areas were similar at least for the younger children below 36 months, although the older children in the 1990 survey were slightly heavier. The analysis by Shen et. al. (1993) indicates that the urban children between ages 0 to 71 months were roughly 2.5 to 3.5 cm taller and 0.6 to 1.2 kg. heavier than rural children.

Third, the fact that the gap in the growth of children between urban and rural areas in China is widening is a notable development in the sense that the increasing gap in incomes, and probably access to public health services, are now being reflected in the nutritional outcomes. Moreover, although the mean child growth in rural areas remains static, the dispersion of distribution becomes wider, meaning increased inequity and heterogeneity in nutritional status in rural children according to recent analysis. In contrast, both the mean and dispersion of child growth improve in urban areas. Thus, when nutrition overall in a rural population group is bad, certain subgroups, presumably the poorest, are disproportionately worse off.

Overall, child malnutrition occurs mainly in rural China where about 70% of the population live (see "Notes" at the end of this section). Here, the major determinants of poor nutritional status have been shown to be infection, household food availability, female gender, and low birth weight. In urban areas, the first two are not related to nutrition, but gender and birthweight are. Infant mortality is also higher in rural than urban areas, which is related to government health care expenditures and literacy. Infant mortality is responsive to changes in these, more so in poor counties.

**Nutrition Amongst The Adult Population.** Data obtained from surveys in 1989 and 1991 showed for the first time an overview of the trends in the nutrition amongst adults in China. The China Health and Nutrition Surveys is a longitudinal survey that covers the provinces of Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong. The panel data of adults aged 20–45 years, analyzed by Popkin et al (1994), showed some significant changes in adult nutrition over the two years. The study classified those who were underweight as those with BMI <18.5, and those groups who were overweight or obese as those with BMI >25.0. In 1991, the proportion of adults classified as overweight was estimated at 11.2% (15.2% in urban and 9.4% in rural), whereas those classified as underweight was about 8.2%.

The trend analysis done by Popkin et al (1994) indicates that the proportion of adults classified as underweight decreased by 0.4% and the proportion classified as overweight increased by 1.9%, between 1989 and 1991. The largest increase in the proportion of overweight (4%) was observed among urban males. In the rural areas, the increase in the proportion of overweight adults was the same for both sexes (1.8%). There was an increase in the proportion of underweight men (1.5%) and women (0.5%) in the lowest income tercile. The study also showed that, concurrently, there was an increase in the proportion of overweight in middle income (3.5%) and high income subjects (3%).

### **Factors Affecting Trends in Nutrition**

**Economic Growth.** Per capita GNP in China in 1993 was estimated at U.S.\$490. Real GDP per capita grew by rapidly between 1986 and 1993, by 6.4% per annum.

The nutritional changes occurring between 1987 and 1990 in China reflect the rapidly evolving patterns of development in the country as a whole. The cities and major urban areas were booming in late 1980s and early 1990s. Economic growth in the rural areas, particularly in inland provinces, has lagged behind urban areas. Rural areas suffered from large out-migration, and have remained isolated from new investments which have been concentrated in urban areas, mainly in the coastal provinces of the country.

Quite consistent with the patterns of child nutrition is the increasingly different trends in the patterns of economic development between coastal and inland regions, and between urban and rural areas. Such disparity is now reflected in the increasingly widened gap in the nutrition of urban and rural areas. The various paths in socio-economic transformation happening in China can be illustrated in the changes happening in the inland provinces. In Heilongjiang, there appears to be a rise in prevalence of underweight children, but not in its urban areas. This can be compared to the fairly rapid economic growth in the coastal province of Guangdong, where the prevalence improved in both urban and rural areas (35.9% to 27.0% between 1987 and 1990).

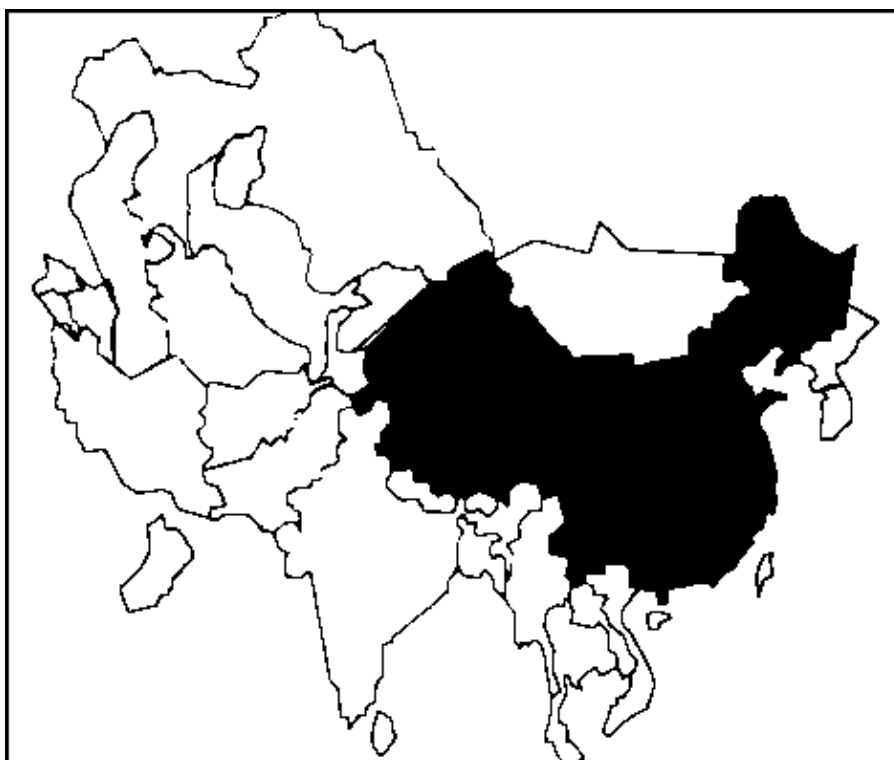
The economic performance and sources of economic growth between inland and coastal provinces have been changing. Using published reports from China's Statistical Yearbook on economic data by region, the gross value of social output (measure adopted by China to measure overall economic development by area) showed that between 1980 and 1990, the share of economic output in the coastal regions increased from 46% to 56%, whereas the share coming from the inland regions declined from 53% to 44%.

**Food Security.** The guarantee of food security in the pre-reform era in China has given way to a new system where access to food has become more of a household responsibility than that of the state. In the period between 1987 and 1990, the data on food consumption in China indicate continuing increases from around 2600 kcals per capita to 2700 per capita on average. These are much improved figures compared to early

1980s. Overall grain output increased from 403 million MT in 1987 to 446 million in 1990, and meat increased from 22 million MT to 28 million in the same period. Households without access to land for agricultural production now have better access to food since food can now be purchased with cash income from commercial production or off-farm activities. However, the average figures showing increases in energy intakes mask regional problems, particularly for the inland provinces.

Data on food energy consumption and supply balance by province indicate that 10 of the 24 provinces were net deficit areas. These areas included those provinces for which the nutritional status of children were very high, such as the province of Yunnan. But although the country produces most of the grain needed to feed the population, transportation and storage problems make it necessary to import grain from overseas to feed the urban population in the coastal areas in the eastern seaboard.

**Health.** An important factor responsible for the static or deteriorating nutrition situation in rural areas is the poor performance of the health sector in rural areas. One of the negative consequences of the economic reforms was the loss of "socialist" privileges from the state such as medical care. The rural health insurance has been ineffective or is diminishing, which leaves a good proportion of these populations without access to adequate health services. The famous barefoot doctors are now starting to disappear in many areas. Hence, health services in rural areas deteriorated for many of the poor.



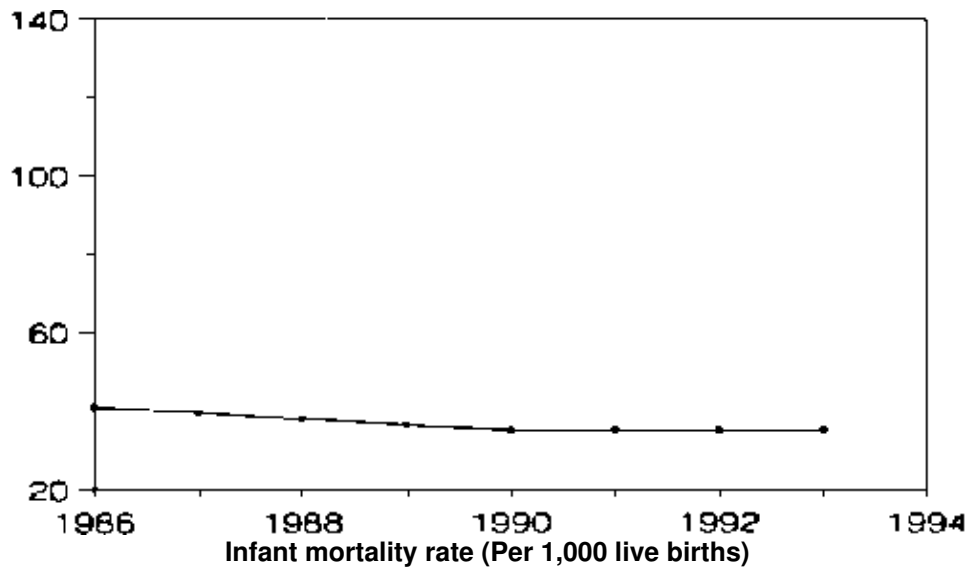
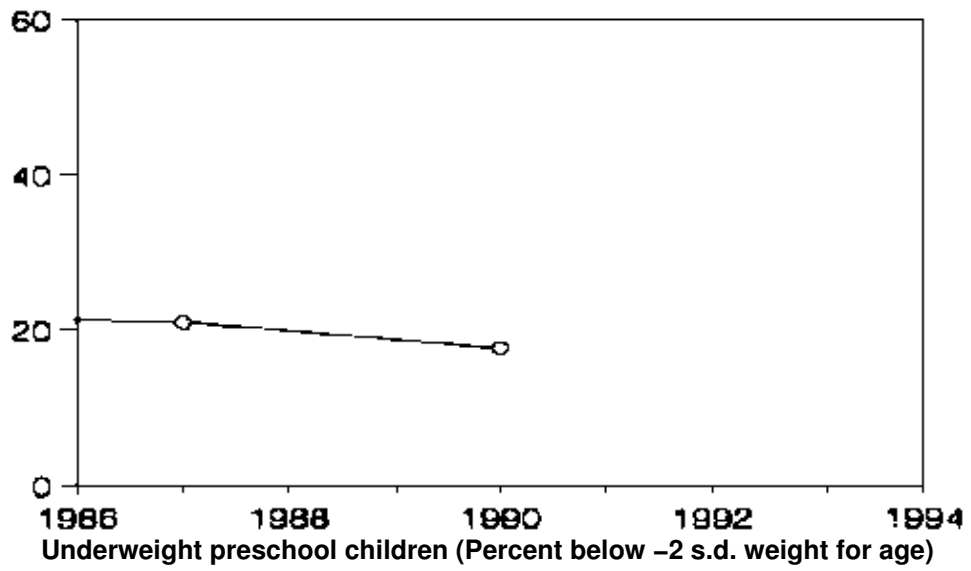
**CHINA**

**(Estimates in 1993)**

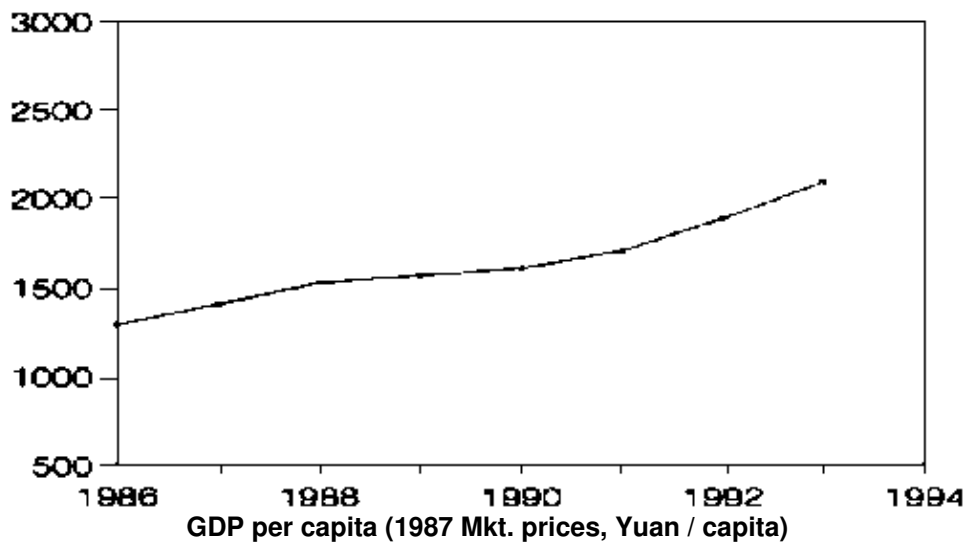
Population	: 1.2 billion
Population Density	: 120 per sq. km.
Population Growth Rate	: 1.5% per annum
Urban Population	: 27%
IMR	: 35
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 490
PPP estimates of GDP (\$ Per Capita, in 1991)	: 2946

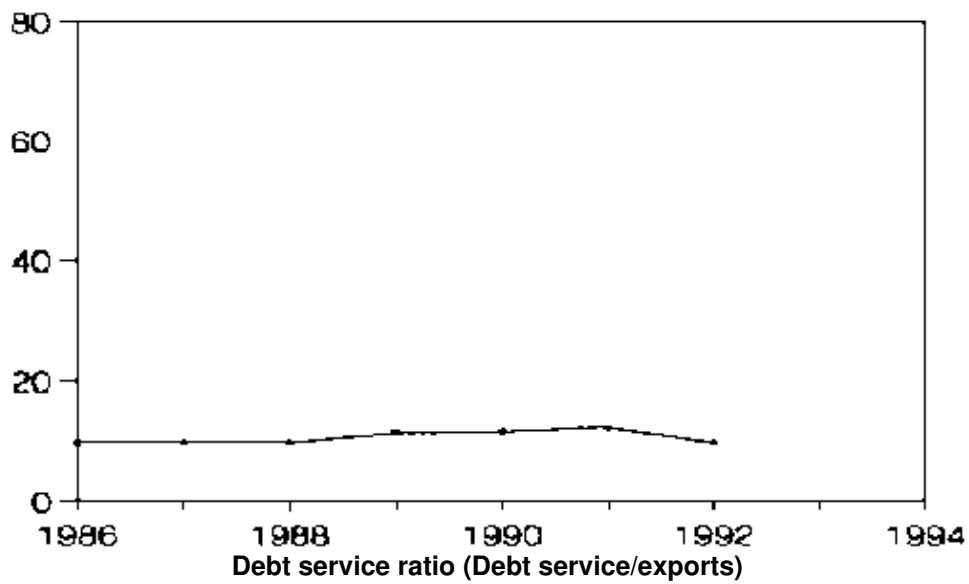
**CHILD GROWTH AND SURVIVAL**



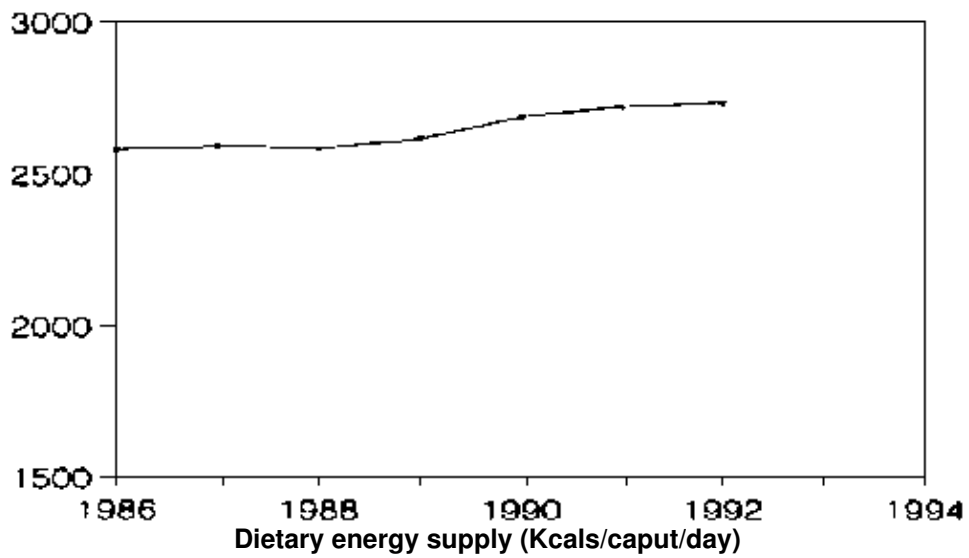
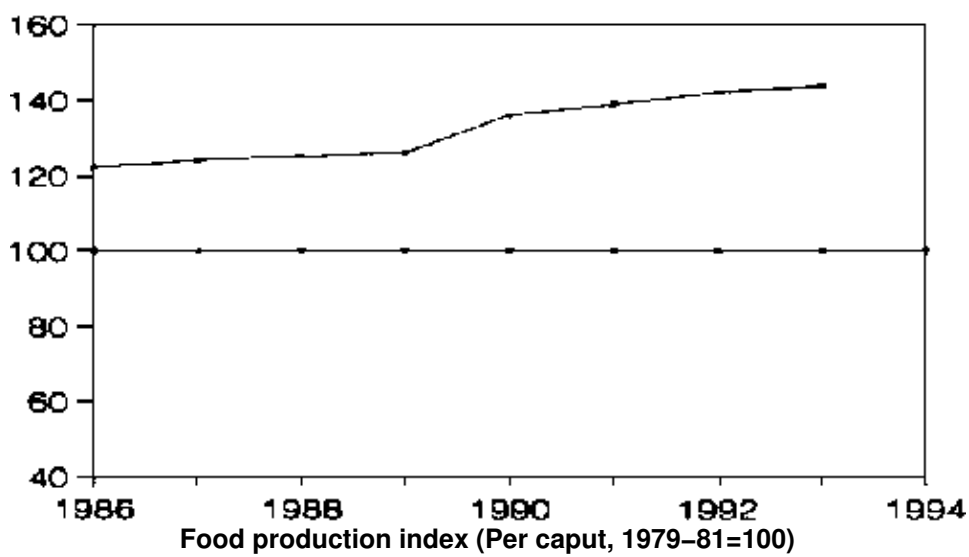


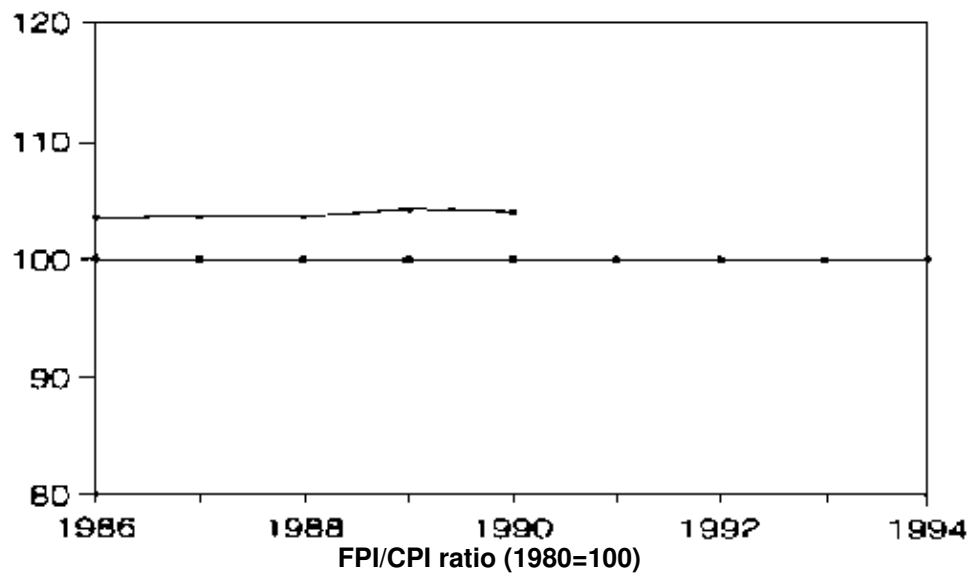
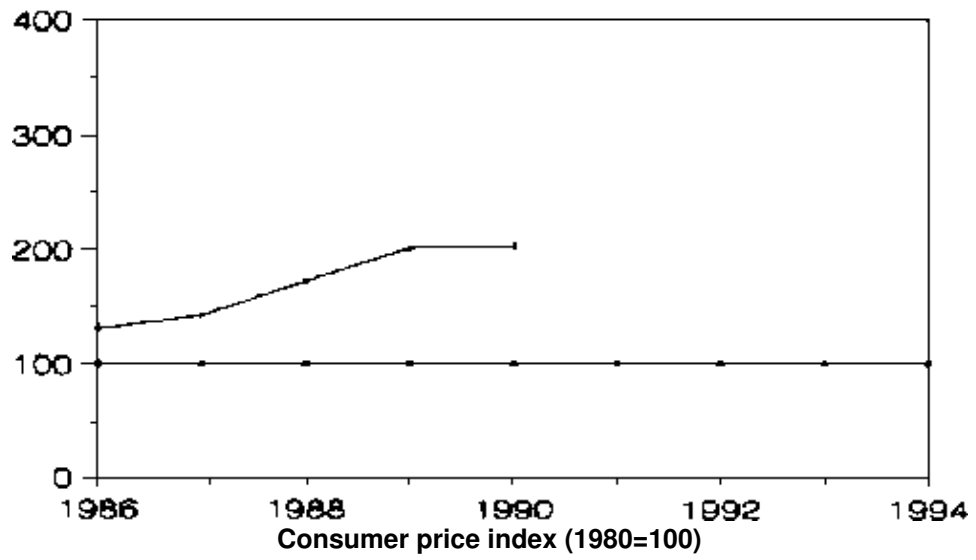
**ECONOMICS**



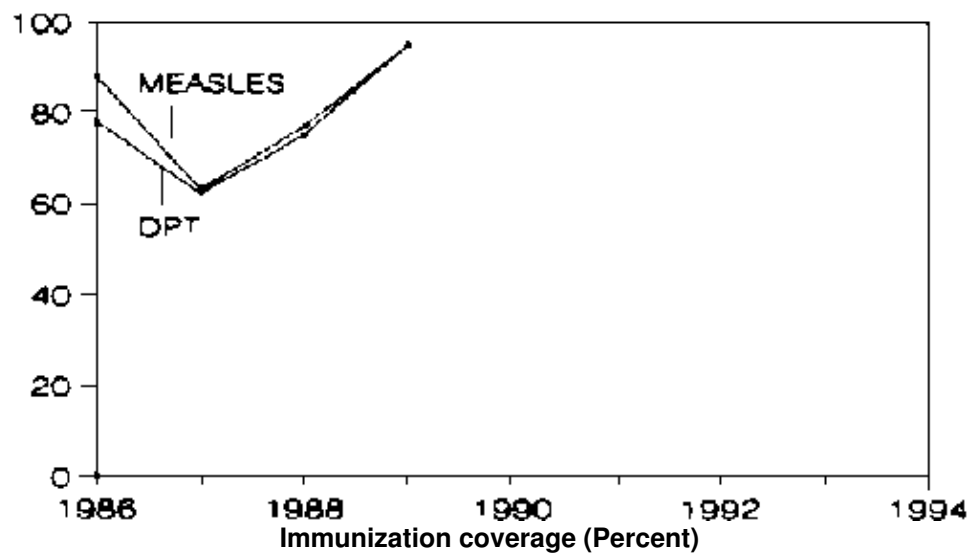


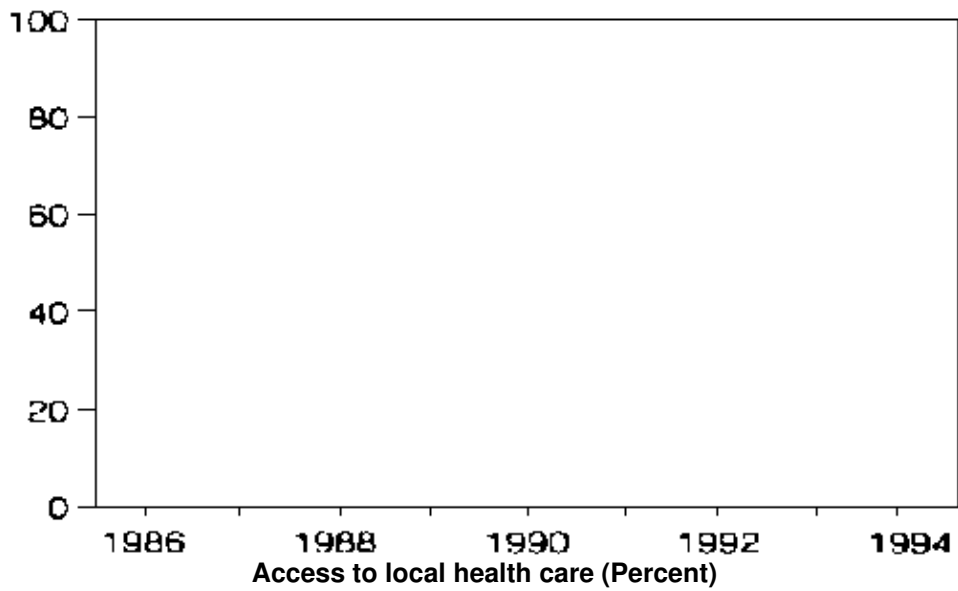
FOOD



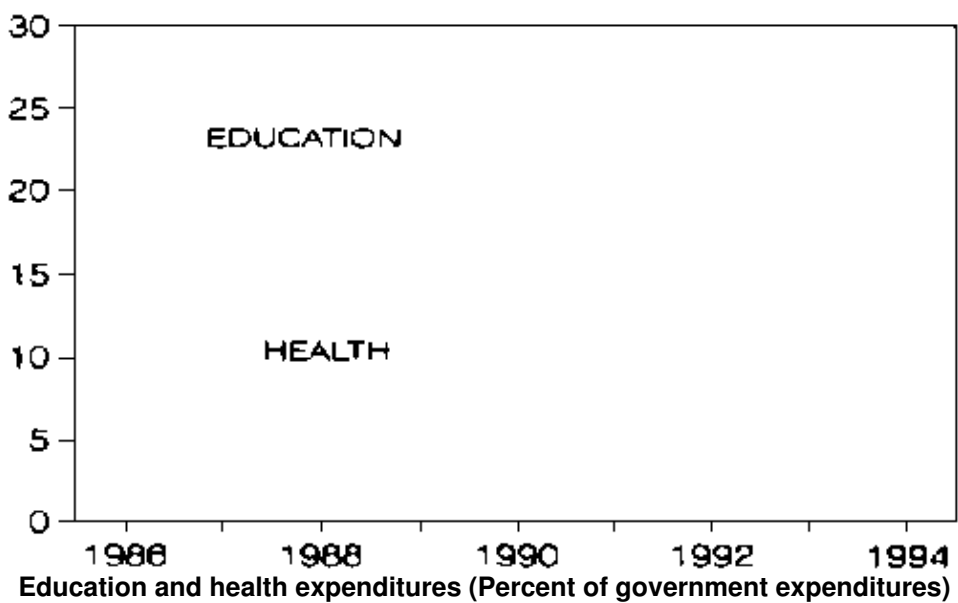
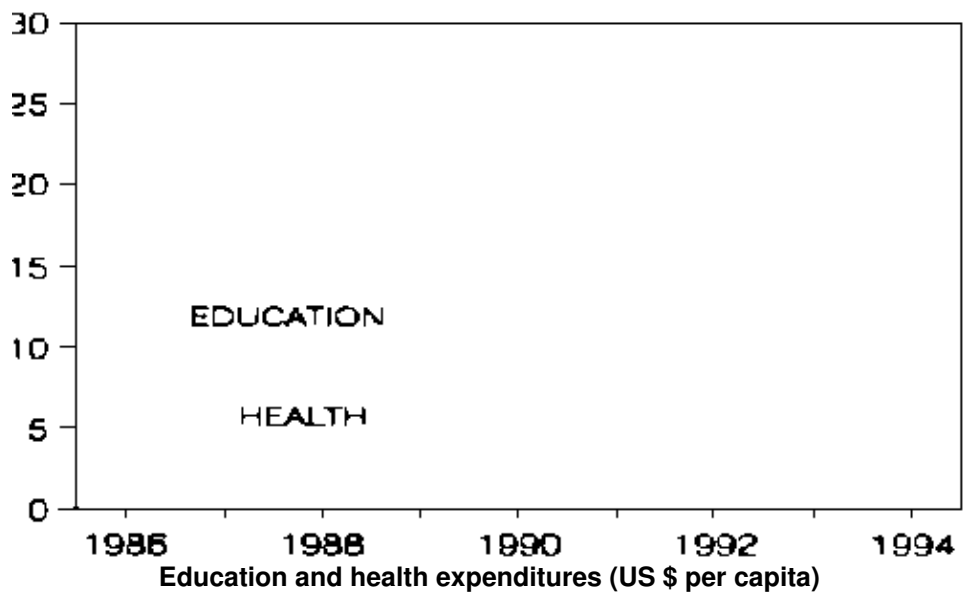


HEALTH





**PUBLIC EXPENDITURES**



**Conclusions**

In recent years, there have been general improvements in the nutrition of children and adults in the country as a whole. It appears from the nutrition trends that, although the reform and development strategies adopted by China have been very effective in raising incomes, faster development in the urban areas, and generally in the coastal provinces, has widened the gap in the nutritional well being between these areas. The static trends in nutrition of children in inland areas maybe a result of the poor performance of health sector in the rural areas.

Another important conclusion is that China is rapidly moving towards conquering the problem of food scarcity and has begun a rapid epidemiological and nutrition transition. Recent data showed that, while the proportions of underweight adults have been declining, there has been a concurrent increase in the proportion of adults classified as overweight or obese. Obesity is often associated with conditions such as hypertension, high serum cholesterol, and insulin resistance that are strong risk factors for other chronic diseases, particularly coronary heart diseases. These findings have considerable implications for the preventive health care policy for China.

## Notes

The reported figure of 60% urban population in some Chinese statistical books is caused by a different definition of rural population around 1990. Until the late 1980s, the rural–urban classification was based on whether a population received government food subsidies. Starting in 1984, the Chinese government began to broaden the administrative boundaries of cities by incorporating nearby rural counties. Thus, a rural county with an essentially agricultural population and no food subsidy may have been labelled urban even though it received no food subsidy. Realizing the inconsistency, recent China Statistical Yearbooks have adopted the 28–30% figure again, for the urban population.

## Costa Rica

Costa Rica is the only nation in Latin America without an army, and one of the most stable and robust democracies in the region. Costa Rica had a population of about 3.2 million in 1993 and is growing at the rate of 2.5% per annum. Its extensive social programs have placed the country's indicators among the best in Latin America. Nutrition trends in Costa Rica were previously reported in the SCN's 1989 Update on the Nutrition Situation (ACC/SCN, 1989, p.146–149).

### Recent Trends in Nutrition

The most recent anthropometric data from the Nutritional Surveillance System of the Ministry of Health indicates continuing trends towards improvements in underweight prevalence. The data for the early 1990s indicates that, for the first time, the underweight prevalence was equivalent to the NCHS standards, i.e. 2.5%.

The prevalence of underweight preschool children (<-2 s.d. weight-for-age) in 1992 was placed at 2.3%. This prevalence had declined steadily since regular measurements started – e.g. from 14% in 1966, 12% in 1975, 6% in 1982, to the recent figure of 2%. Costa Rica is only the second country in Latin America to have achieved this level of nutrition, next to Chile, which reached this rate in late 1970s. From the surveillance data, most regions in the country showed improvements from 1989 to 1992 (see Figure 1). There was evidence, however, that the prevalence in rural areas was higher than in urban centers in the country.

The recent data also gives trends in the prevalence of overweight preschool children. Results indicate that, on average, the proportions of obese preschoolers have been low at 3.3%, which was maintained over the period 1989 to 1992. Previous data reported in Update 1989 gave a prevalence of overweight of about 6.9% of all preschoolers. The IMR of 14 per 1000 live births in 1993 is one of the best in Latin America.

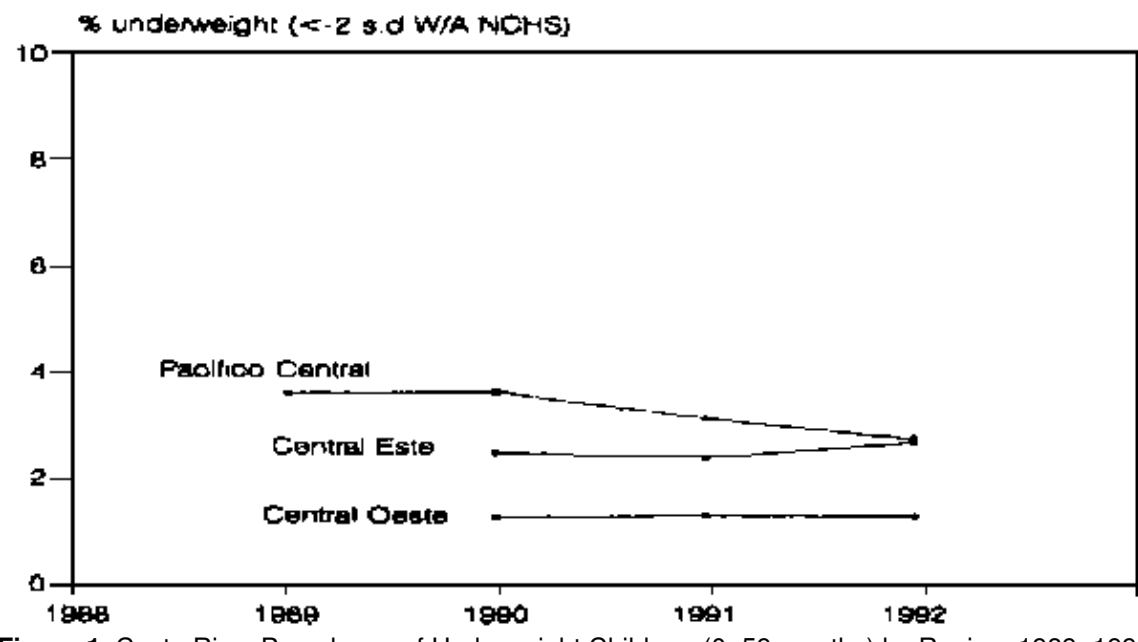
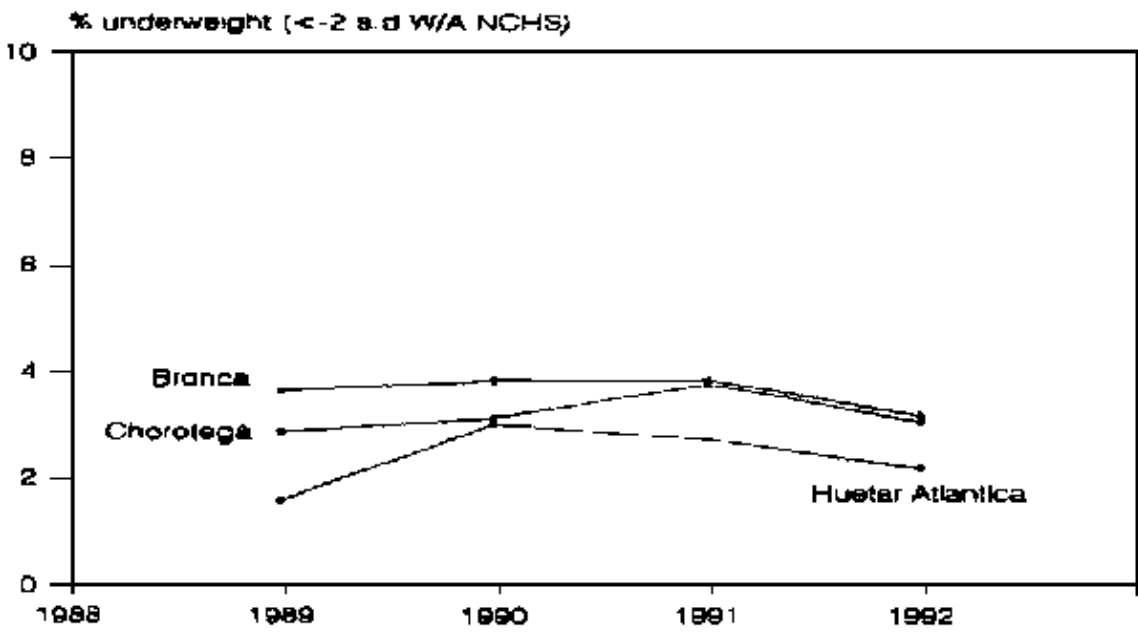
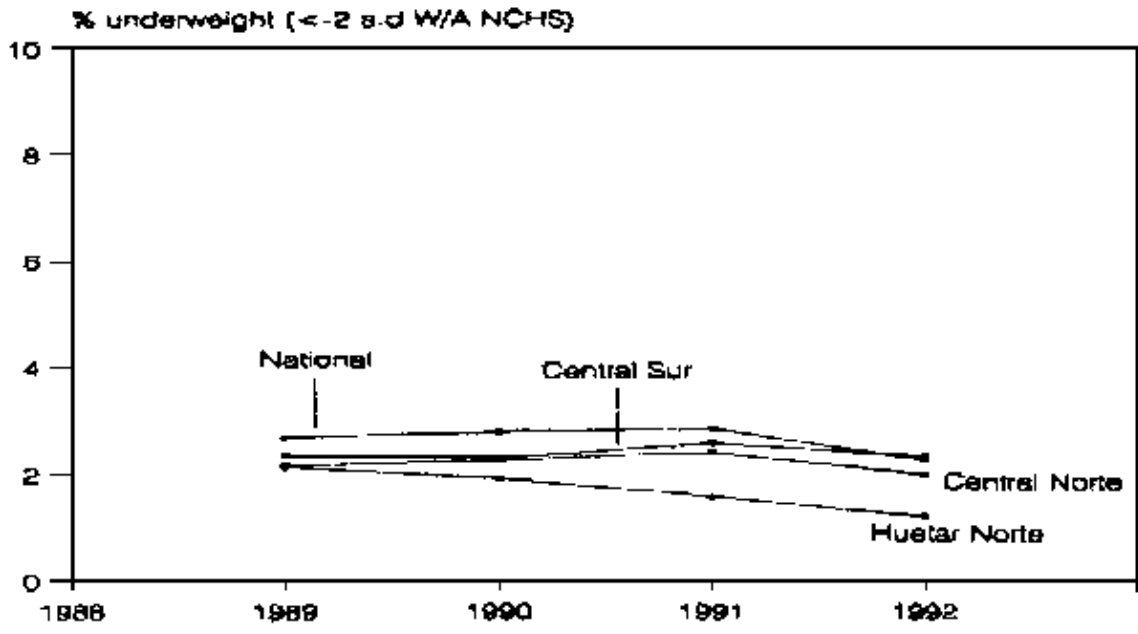


Figure 1. Costa Rica: Prevalence of Underweight Children, (0-59 months) by Region, 1989-1992

## Factors Affecting Trends in Nutrition

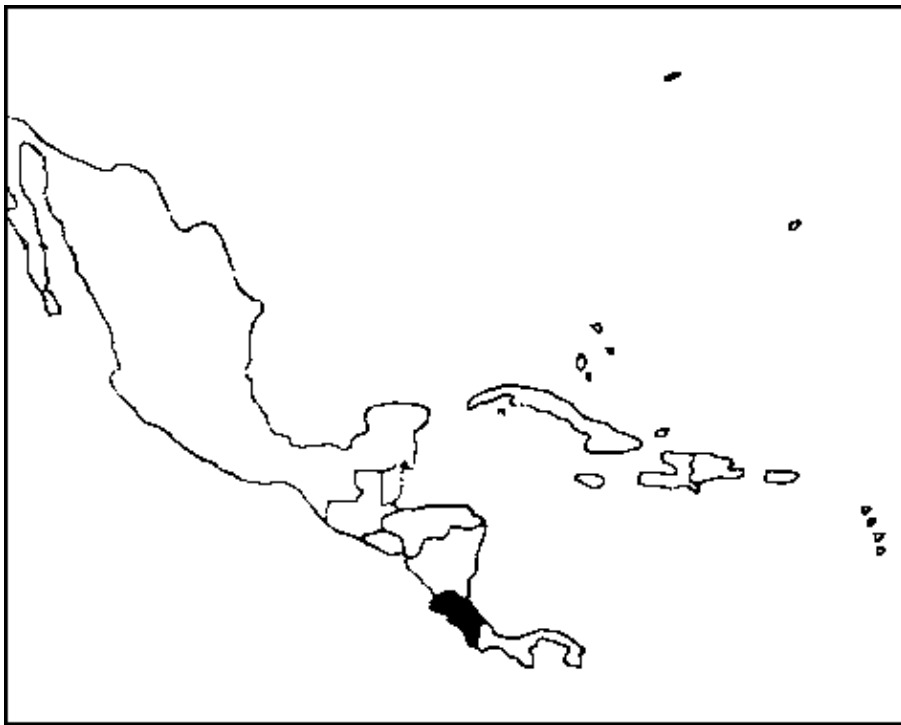
**Economic Growth.** In 1993 Costa Rica's GNP per capita was estimated at U.S.\$2,160. GDP per capita grew by 1.9% per annum between 1986 and 1993. Following two years of slow growth, the Costa Rican economy expanded by 7.3% in 1992, as the manufacturing and services sectors responded to growing demand for domestic investment and nontraditional exports. Despite the strong export growth, imports grew more rapidly, stimulated by large private external capital inflows that more than financed the rapidly deteriorating current account deficit. The capital inflows responded to high interest rates and improved investor confidence in economic management.

**Food Security.** Agriculture forms the backbone of the Costa Rican economy, and its national strategy has recently focussed on the production of export crops that, in recent years, meant large permanent shifts of some land from food crops such as rice, maize, and beans. The country now relies for a good portion of its cereal requirements on imports. The performance of the export crop sector has been good (particularly banana and coffee), and in non-traditional crops such as cut flowers, vegetables, coconut, tropical fruits, and macadamia nuts. The focus of the food security strategy has been household food access and individual utilization, especially for the poor. Calorie supply per capita has been kept high at around 2900 in 1992, increasing from the 1982 levels of 2509 kcals per capita. Although general inflation has been quite high recently (22% in 1992 and 17% in 1989), the food price index has not increased any faster. The purchasing power of the minimum wages had been rising despite the high inflation rates in recent years. This rose by 20% from 1980 to 1990.

**Social Security, Health, Education.** Costa Rica's extensive social security system, which encompasses unemployment benefits, health care, pensions, and housing was established in the 1940s. This system has, to a considerable degree, been responsible for the overall improvement in the nutrition and health well being of the average citizen. The government's commitment to this social security system has been maintained even at the height of the adverse shocks of the early 1980s, and received even more attention in recent years (see Public Expenditures).

The absolute per capita expenditures on health care by the government reached \$140 per capita, among the highest in developing countries, and \$80 for education. Health care budgets had been rising and nearly doubled in the last decade or so. The budget for education, although high, has not been increasing on a per capita basis since 1987.

Access to health care of the population is nearly universal. In 1988, the population considered to have access to basic health services was registered at 97%, one of the highest in the world, including those in the developed countries. Pregnant mothers generally had access to antenatal care (91% in 1988). Immunization coverage of all infants was placed at 95% against DPT in 1991, and 90% against measles.

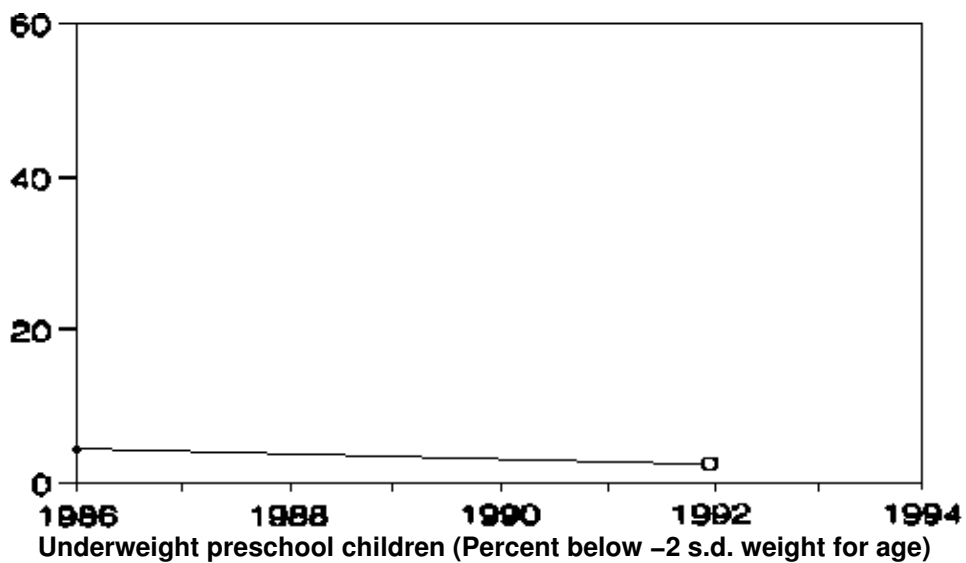


**COSTA RICA**

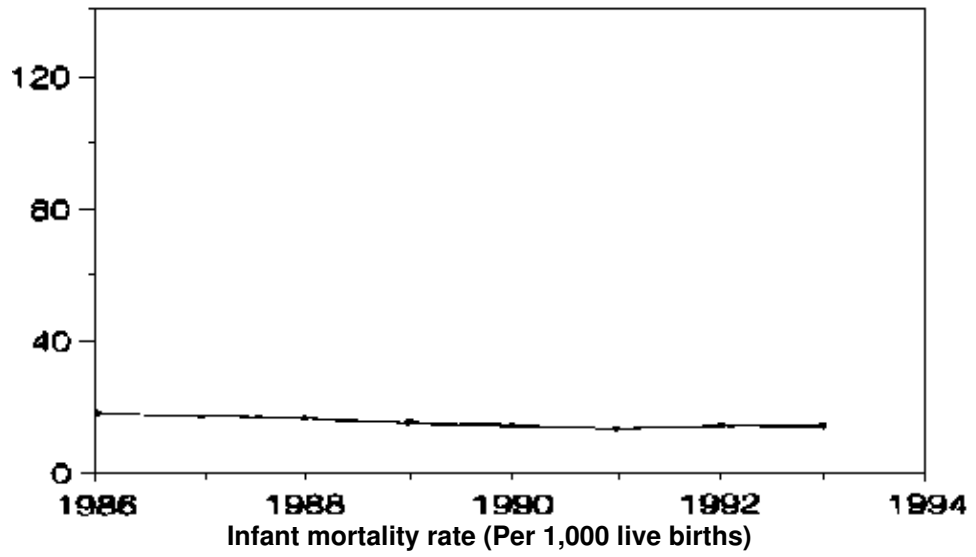
**(Estimates in 1993)**

Population	: 3.21 million
Population Density	: 61 per sq. km.
Population Growth Rate	: 2.5% per annum
Urban Population	: 48%
IMR	: 14
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 2,160
PPP estimates of GDP (\$ Per Capita, in 1991)	: 5110

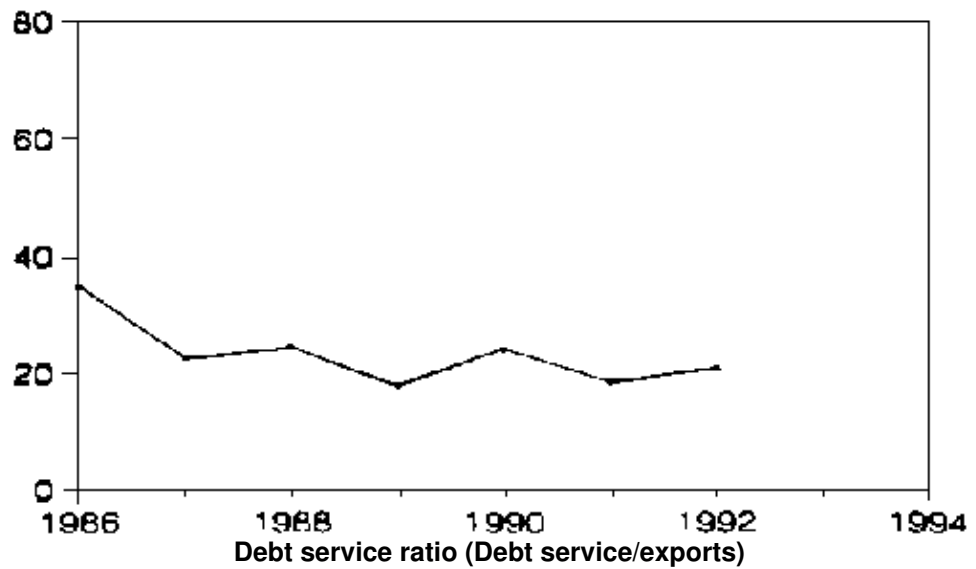
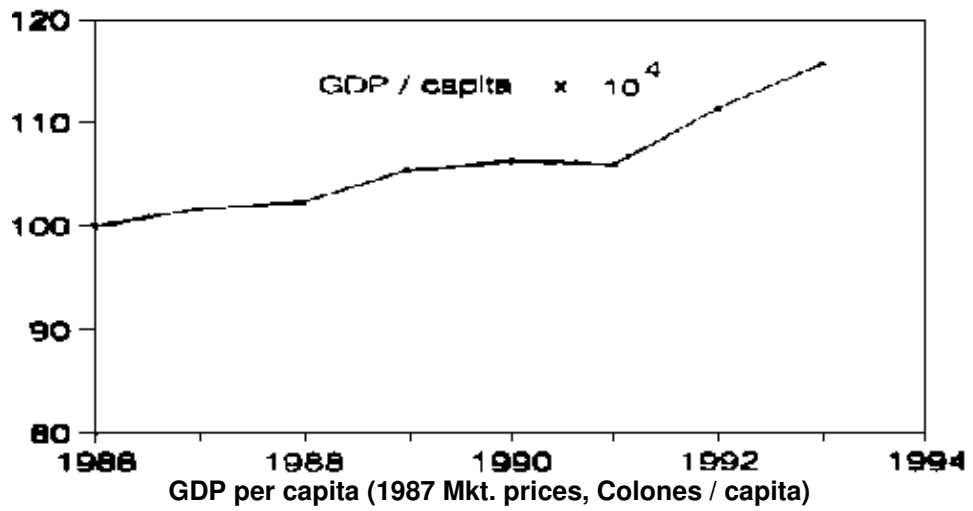
**CHILD GROWTH AND SURVIVAL**



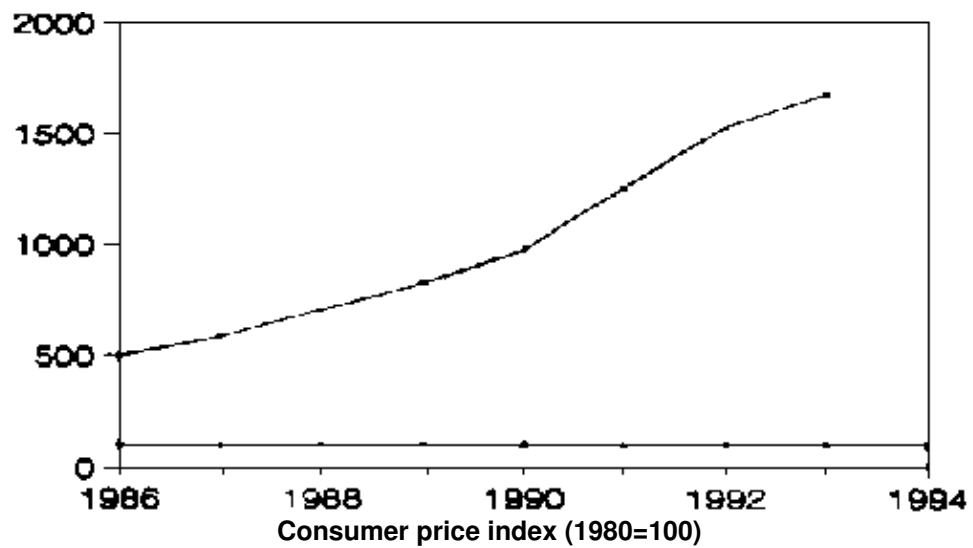
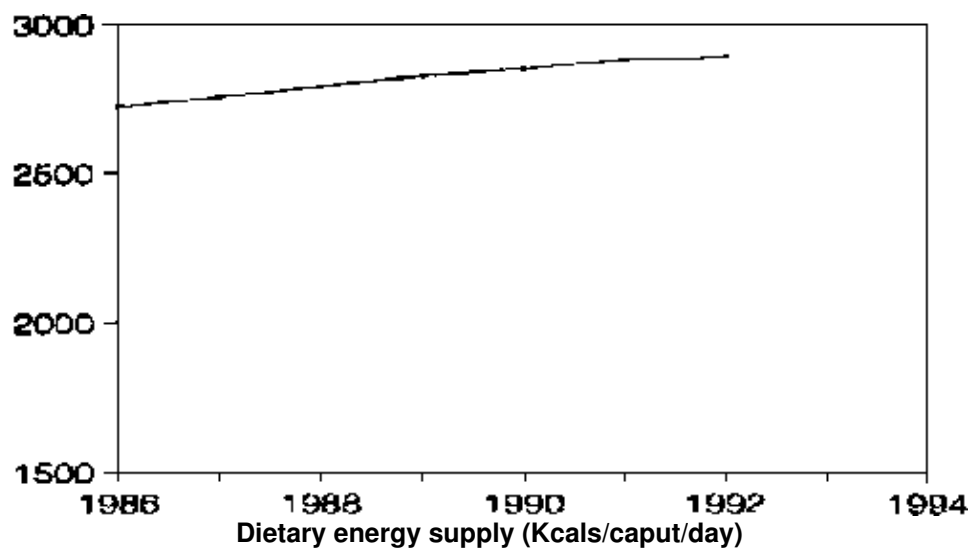
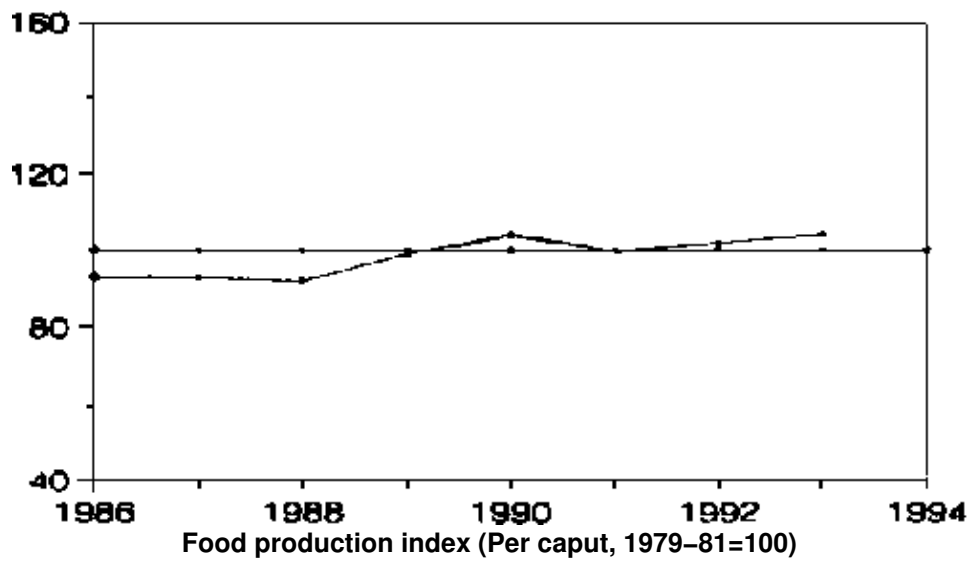


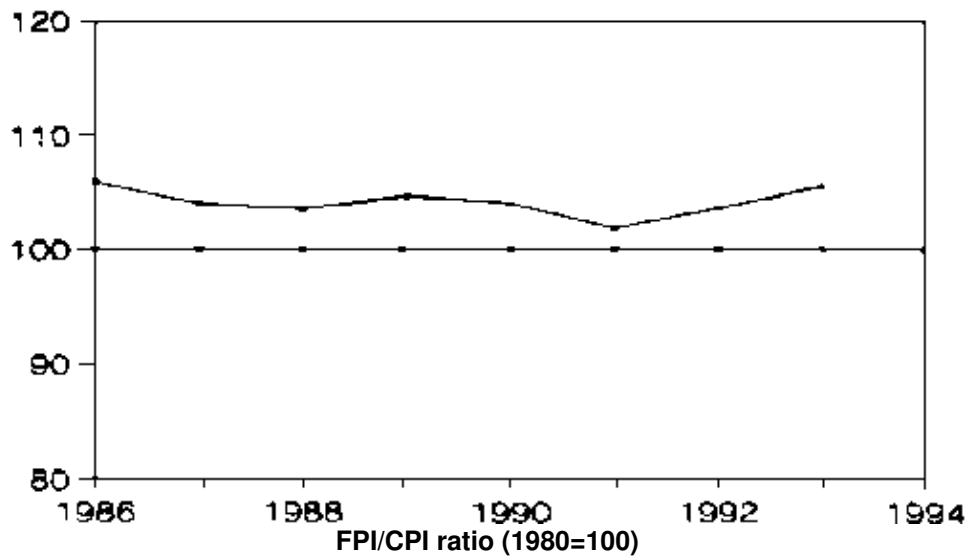


### ECONOMICS

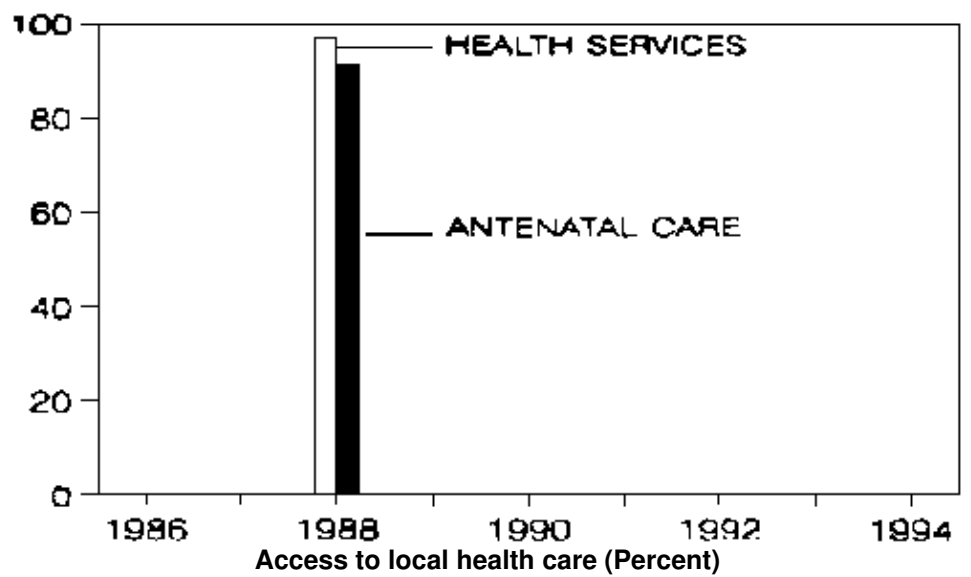
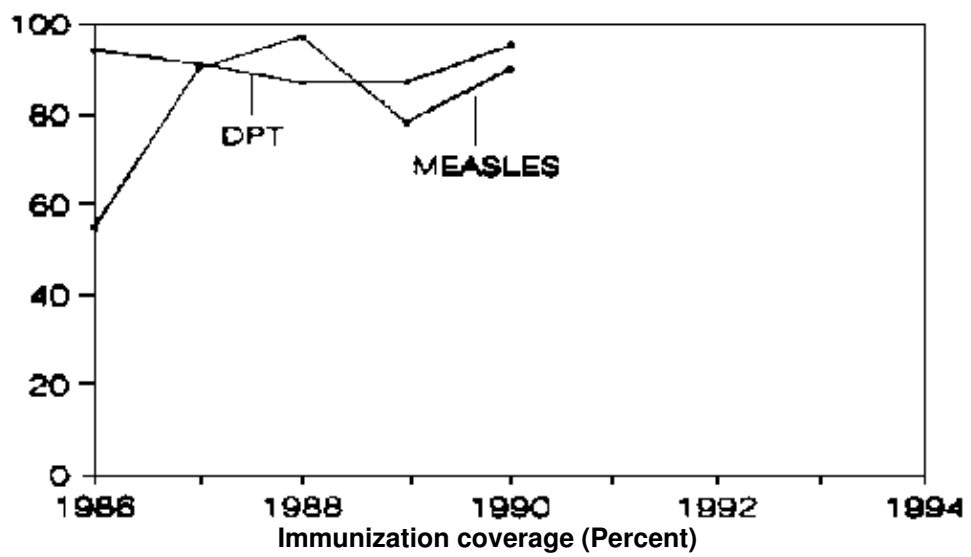


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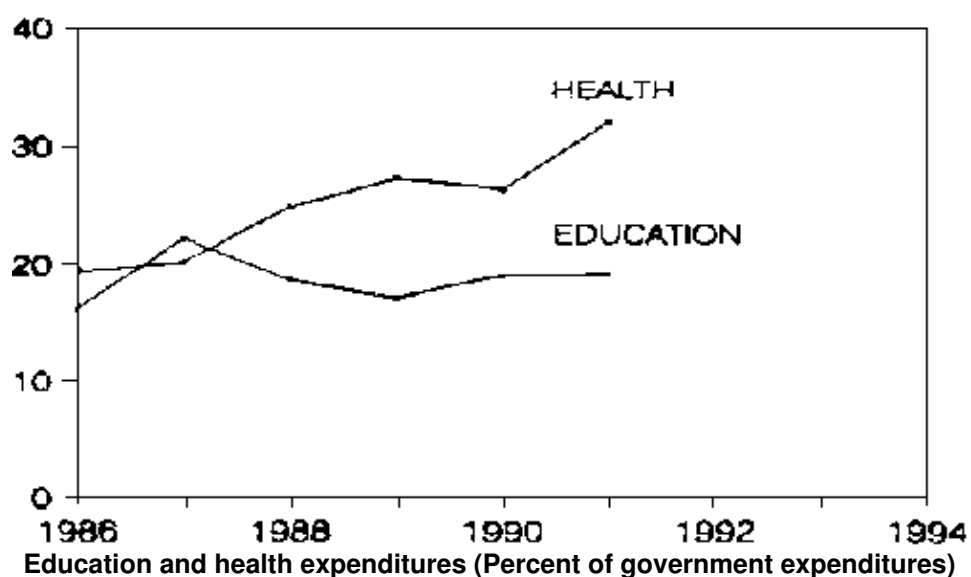
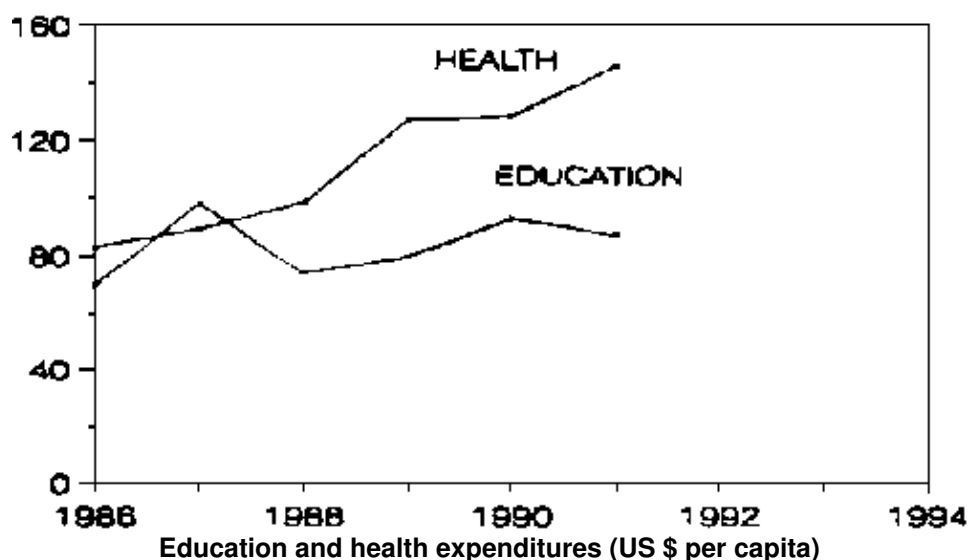




**HEALTH**



**PUBLIC EXPENDITURES**



## Egypt

In 1993, Egypt's population was estimated at 60 million, which is expected to rise to 64 million by the year 2000. The majority of the population is crowded into the Nile Delta and Valley. Nearly half of the population lives in cities.

The nutrition situation in Egypt up to 1990 was described in the ACC/SCN's Second Report on the World Nutrition Situation (ACC/SCN, 1993, p.45–50), and in a case study entitled "Review of Trends, Policies and Programs Affecting Nutrition and Health in Egypt (1970–1990)", (Nassar, 1992). The information here updates these earlier reports.

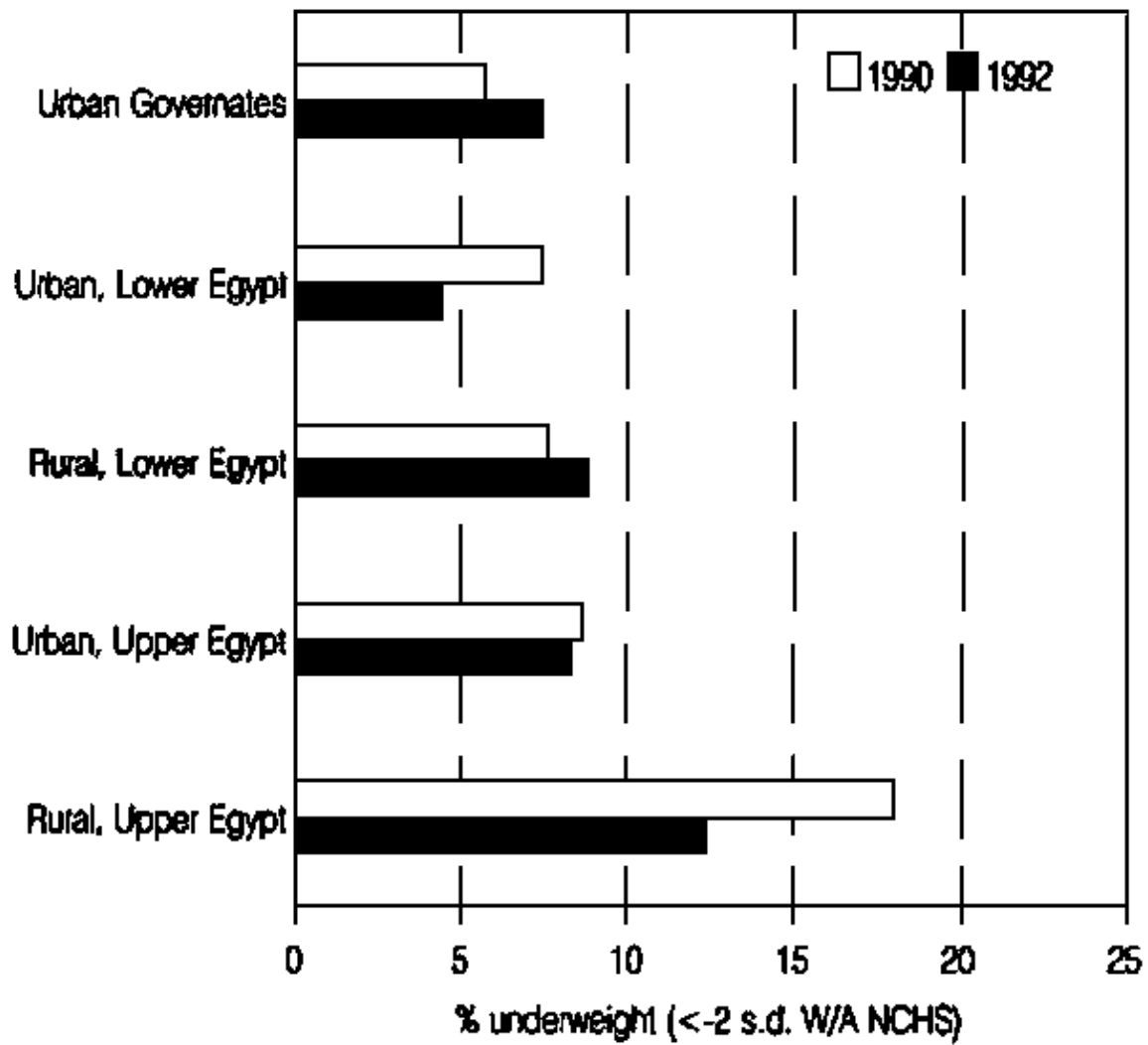
### Recent Trends in Nutrition

Recent nutrition trends in Egypt can be assessed from two nationally representative anthropometric surveys – one carried out in 1990 by the PAPCHILD project of the Arab League and the other carried out in 1992 in collaboration with DHS, with both sources of data reporting comparable sampling procedures and age categories.

The national averages for the two surveys showed that the level underweight improved from 10.4% in 1990 to about 9.4% in 1992. Most of the gains were made in the rural sector of Upper Egypt where the prevalence of underweight improved from 18% in 1990 to 12% in 1992 (see Figure 1), and in the urban part of Lower Egypt (from about 8% to 4%).

In the 1992 survey, anthropometric measurements of women were also included for the first time. These revealed that only around 1.5% of Egyptian women of reproductive age are underweight (below 18.5 BMI). However, the prevalence of obesity is high, with about 29% of women with BMI of 29 or greater.

In the same survey, the proportion of women with height below 145 cm (a cut-off for obstetric risk) was estimated at about 1.3%, while those who had weights below 50 kg were estimated at only 8.9%, which is very low compared to many other developing countries.



**Figure 1.** Egypt: Prevalence of Underweight Children (1–59 months) by Region, 1990–1992

Source: Egypt National Population Council/DHS (1993)

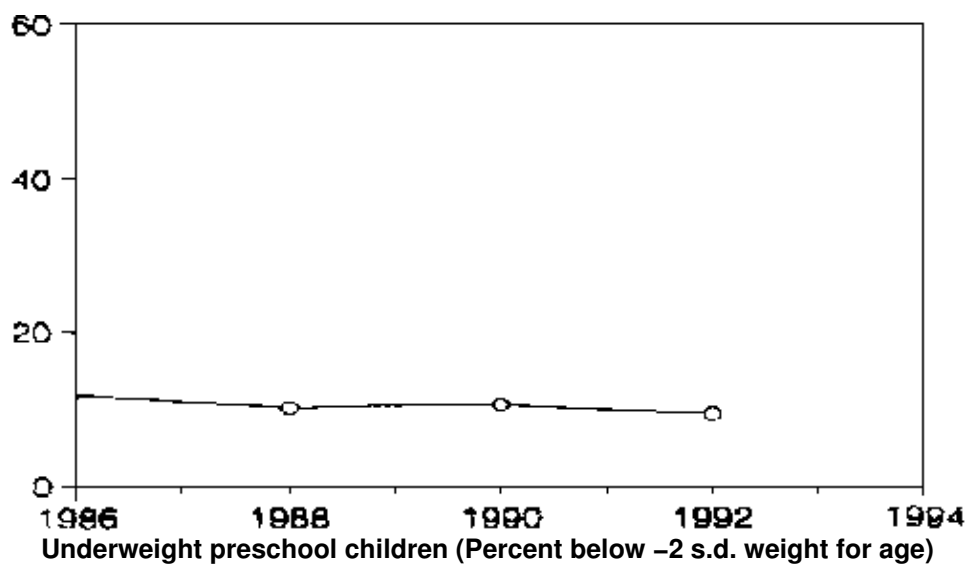


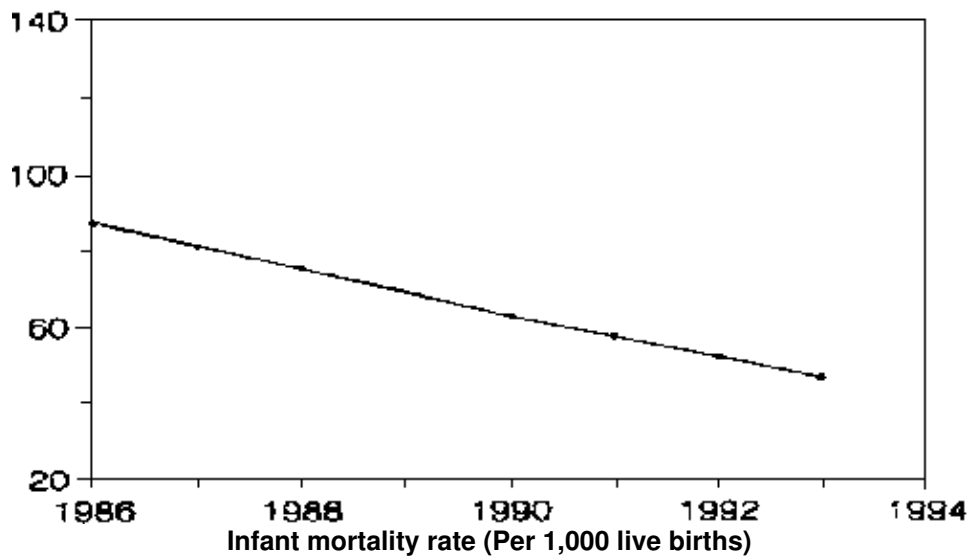
EGYPT

**(Estimates in 1993)**

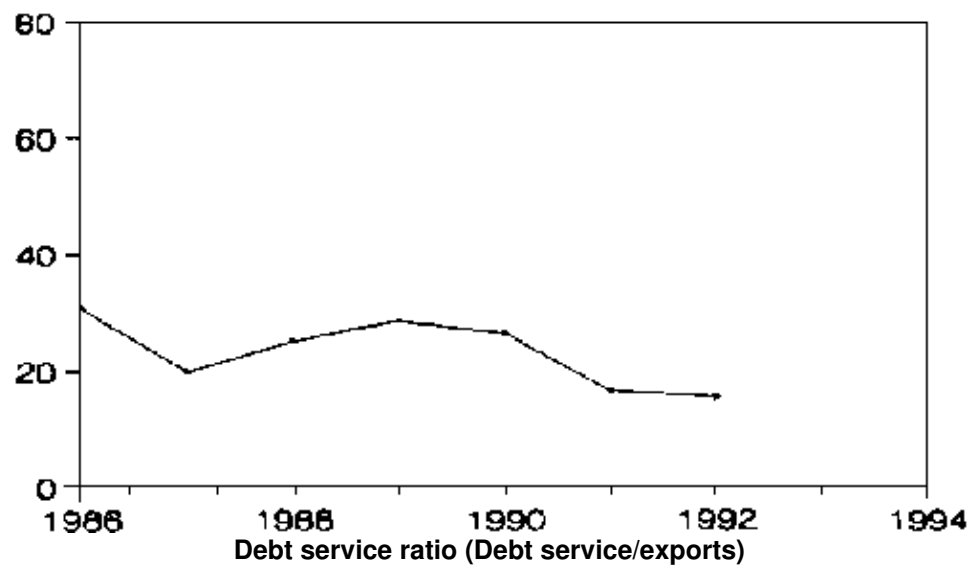
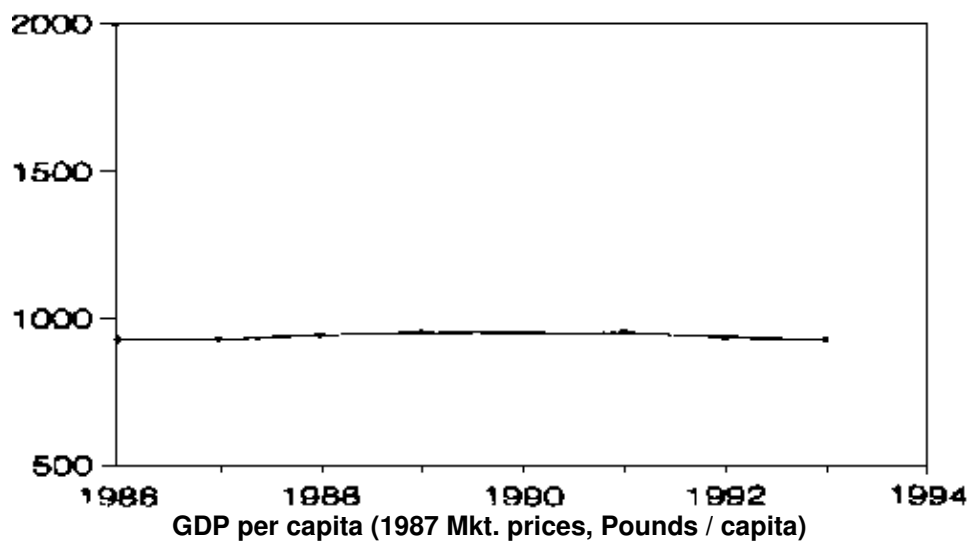
Population	: 56 million
Population Density	: 53 per sq. km.
Population Growth Rate	: 2.4% per annum
Urban Population	: 44%
IMR	: 46
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 660
PPP estimates of GDP (\$ Per Capita, in 1991)	: 3600

**CHILD GROWTH AND SURVIVAL**



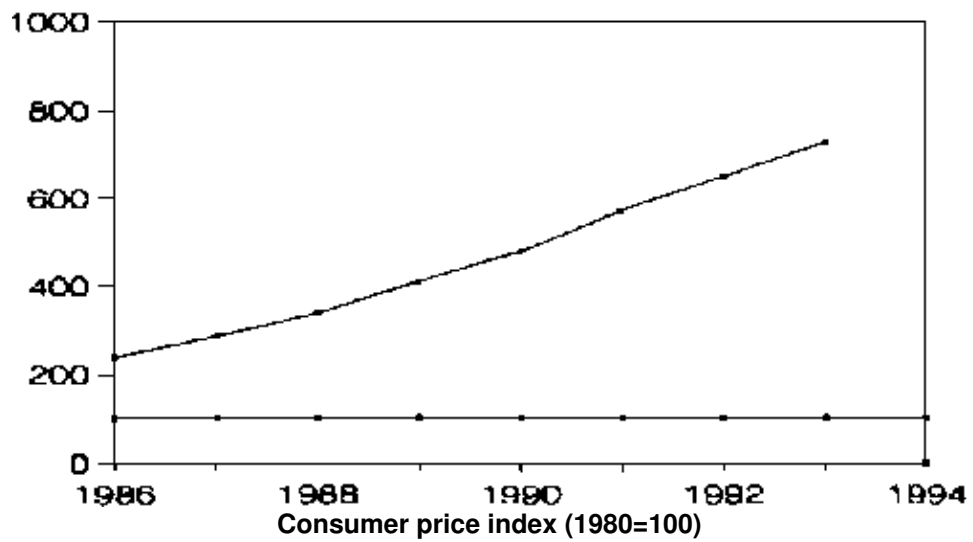
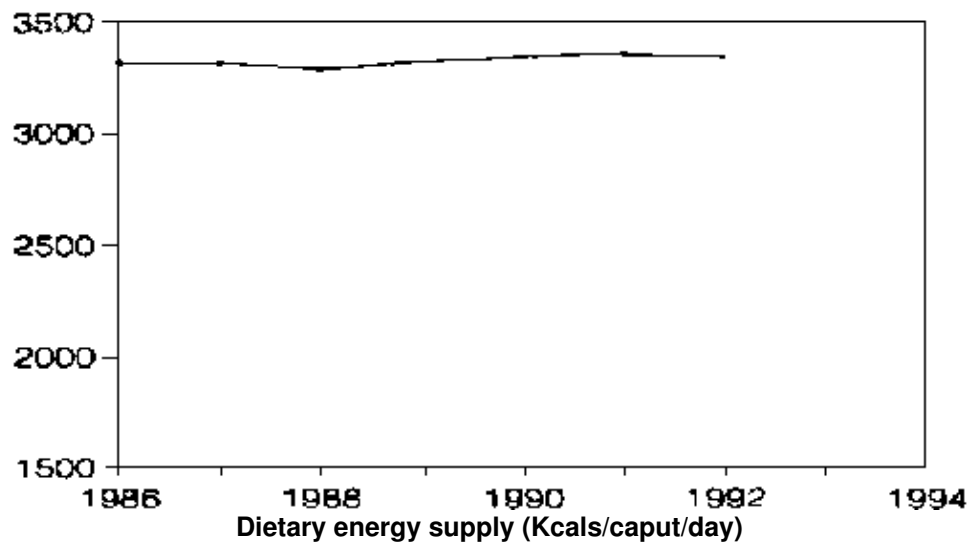
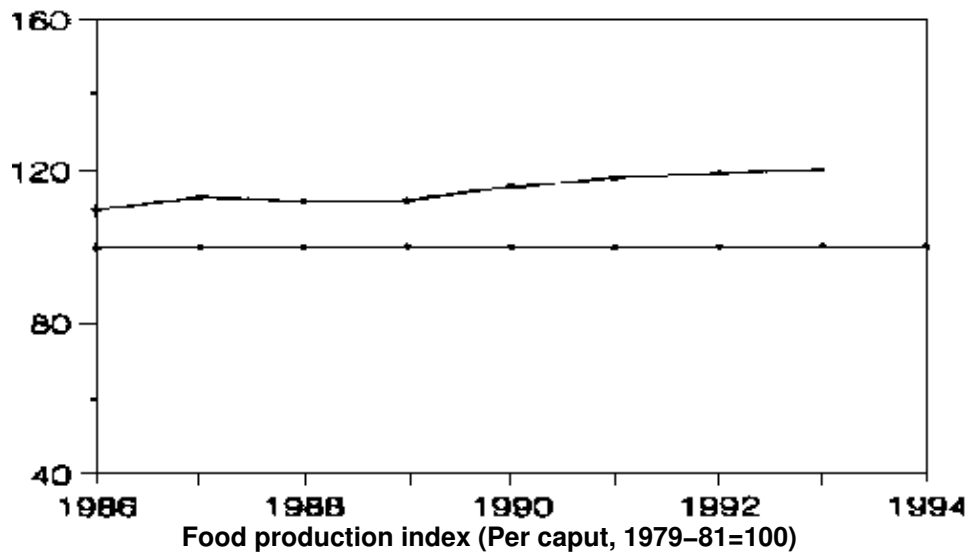


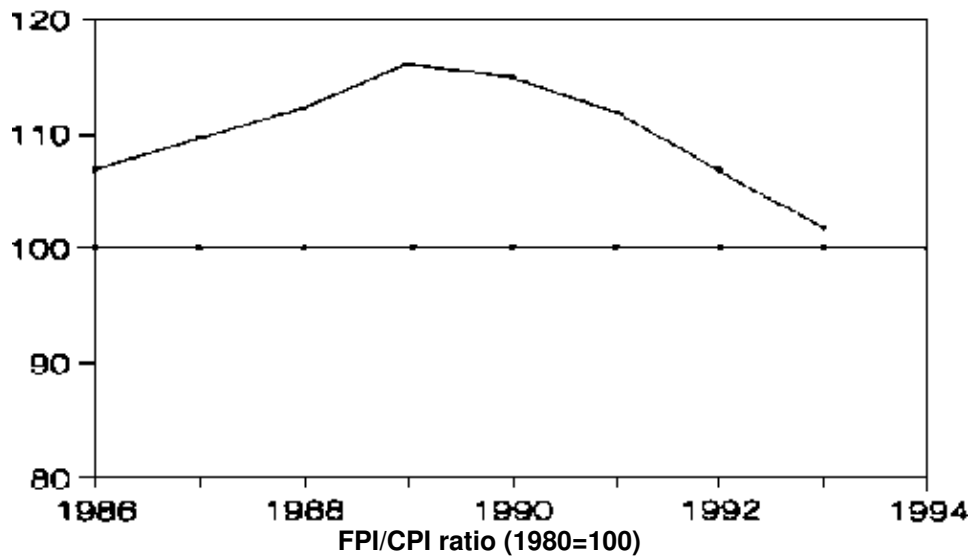
**ECONOMICS**



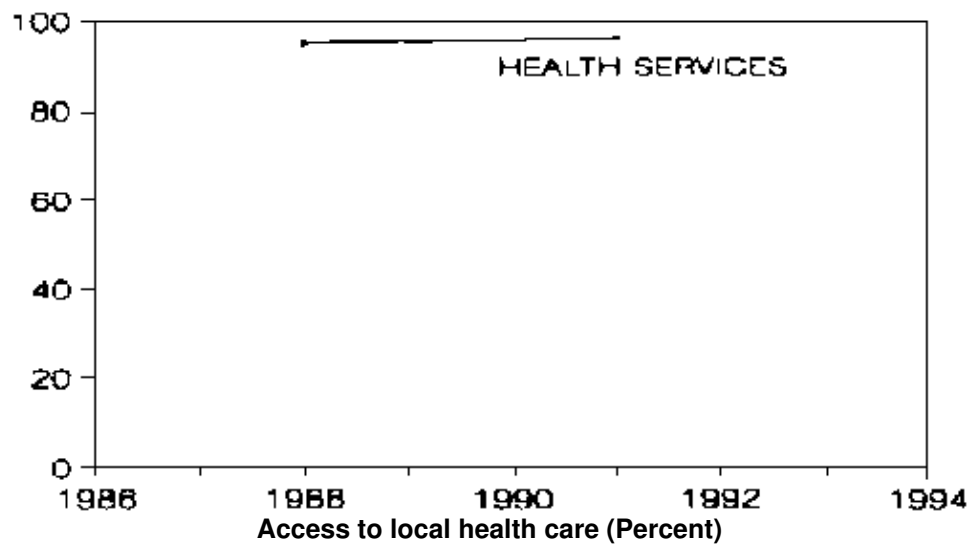
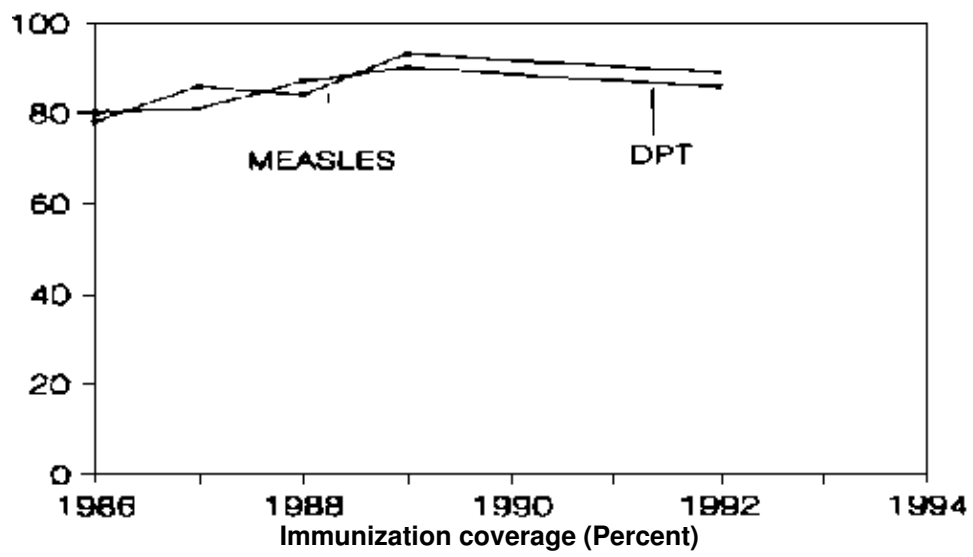
**FOOD**



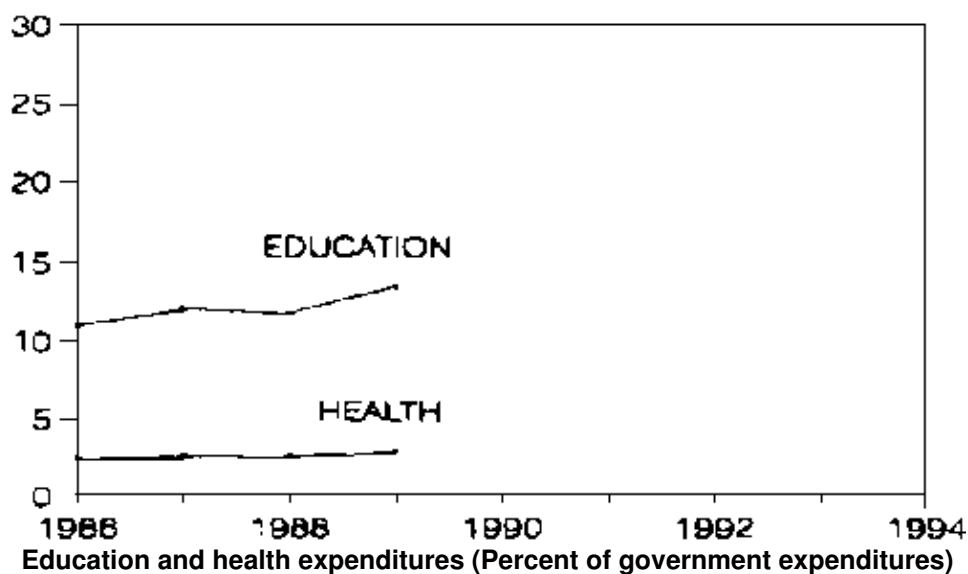
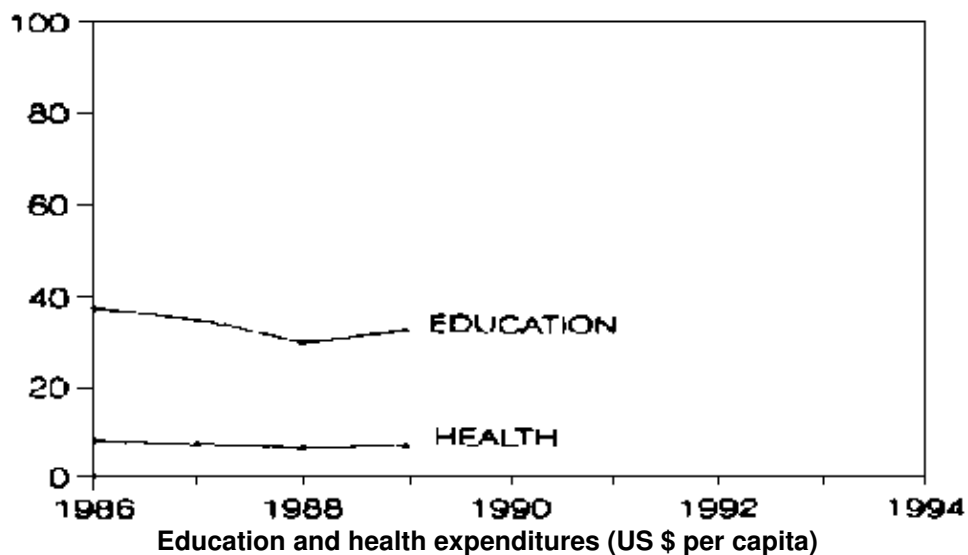




HEALTH



PUBLIC EXPENDITURES



### Factors Affecting Trends in Nutrition

**Economic Growth.** In 1993, per capita GNP was estimated to be U.S.\$660. Per capita GDP remained virtually constant between 1986 and 1993.

During the 1980s Egypt did not adjust its economy to adverse external shocks, such as the decline in oil prices and increase in interest rates, resulting in massive fiscal and current account deficits, and unsustainable debt accumulation. Economic growth slowed due to substantial reduction in capital inflows and a large accumulation of unmet debt obligations.

The government adopted a comprehensive economic reform package and a structural adjustment programme (ERSAP) in March of 1990. This programme is designed to correct structural weaknesses of the economy and achieve macroeconomic stability. Under this programme the government reduced expenditures on food subsidies, public payrolls, and defense. These expenditures then increased in FY91 due to increases in defense spending and food subsidies related to the Gulf crisis and the return of large numbers of workers from Gulf area. Government expenditures then fell again in FY92 mainly due to a significant reduction in subsidies and the level of public investment.

As a result of increase in government revenues to 35% of GDP in 1992, the overall fiscal deficit (including public enterprises) fell to 6.4% of GDP in FY92. This was mainly due to increased tax rates, improved tax administration, reformed custom duties and higher prices for energy, electricity, and other goods and services. Inflation rose from 19.8% in FY91 to 21% in FY92, mainly reflecting high energy prices and tax rate.

Recent analysis of the impact of the structural adjustment measures on poverty in Egypt indicates that the level of poverty rose between 1982 and 1991.

**Food Security.** The Egyptian food subsidy system is one of the most extensive in the world. Virtually everyone (90%) of the population has access to direct food subsidies. The food subsidy program is one of the largest single components of the national government budget, estimated at around 10% (about US\$1 billion, in 1992). Thus, food security in Egypt is affected directly by policies such as food rationing, food subsidies, and aid. In order to reduce the rising food gap and high food dependency ratio, which adds an extra burden to Egypt's balance of payments and exhausts the resources needed for capital imports, serious efforts have been made to improve the performance of the agriculture sector since the early 1980s.

Despite the high inflation rate (13.6% in 1992 and 21.3% in 1989), food consumption of the average Egyptian has remained virtually unchanged. The calorie supply per capita remained among the highest in the developing world, in excess of 3300 kcals/person/day.

For the period between 1990 and 1992, the policy of large food subsidies remained in place for wheat and flour, edible oils, and sugar, which are sold through a system of ration shops, government retail stores, and cooperatives. The subsidized price of bread was last increased in 1988. But for other items, the government has allowed the subsidized price to rise for rationed rice, regular sugar, rationed oil, and regular oil since 1992. Since flour (in the form of bread) is the largest source of calories in the Egyptian diet, increases in prices of other foods have not generally caused a decline in per capita calorie consumption.

Increases in the subsidized price of rice, sugar, rationed oil, and regular oil in 1992 were not matched by increases in wages. It is likely, therefore, that the impact of these increases may have hurt the poor.

The trends of the ratio of the food price index to the consumer price index has been declining since the last increase in the price of subsidized bread in 1988. The ratio in 1993 is nearly 100, which implies that the overall price of food has not been growing faster than other items in household's budgets.

**Health, Population.** In the area of child immunization, considerable gains have been made. Two DHS surveys (1988 and 1992), which are comparable in sampling procedures, provide a good basis for understanding these trends. The proportion of infants 12–23 months of age who were immunized against BCG increased from 56% in 1988 to 88% in 1992; while those with at least 3 DPT shots increased from 50% to 73% in the same period.

The rate of population growth has dropped from 3% in 1985 to 2.3% in 1993, probably resulting in part from intensive family planning programmes. Crude birth rate as put by the state statistics agency (CAP–MAS) in 1993 is at 29 per thousand, and life expectancy of around 60 years. The total fertility rates based on the DHS surveys declined from 4.4 births per woman in 1986–88 period to 3.9 in 1990–92.

## Ethiopia

With a population of 53 million, Ethiopia is the second most populous country in Sub-Saharan Africa; some 3 million people live in Eritrea, now independent after a protracted civil war. There are 76 various ethnic groups with 286 different languages in Ethiopia, and a split of 40% Christian and 45% Muslim. A large part of the population is concentrated in the highland areas in central and northern regions. The limited data available up to around 1987 were described in the ACC/SCN's Update on the Nutrition Situation (1989, p.48–51).

### Recent Trends in Nutrition

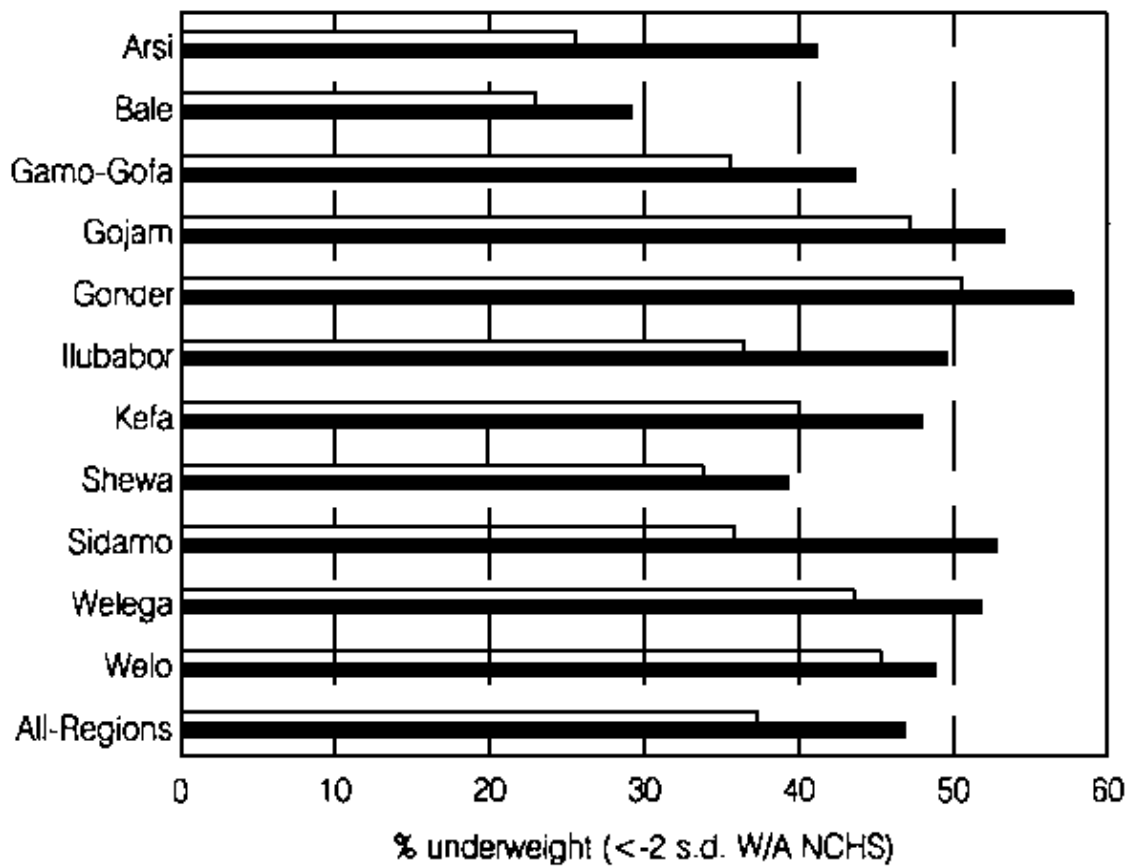
Trends can be assessed from two national nutrition surveys, in 1983 and in 1992. Both of these were carried out during the post-harvest season, and the results are considered comparable. An analysis done by the Central Statistical Authority (with assistance from Cornell University) comparing 11 regions of the country indicates that the nutrition situation in 1992 was significantly worse than 1983. For all 11 regions combined, the prevalence of underweight in children (6–59 months, <–2 SDs NCHS in both surveys) increased from 37.3% in 1983 to 46.9% in 1992. This prevalence in 1992 of nearly 50% underweight is likely to be (with Mozambique) the highest in Africa. Projected to the entire 0–4 year population, this implies that the number of underweight children rose from 2.7 million in 1982 to about 4.6 million in 1992, or nearly doubled.

The regional trends have also been estimated by comparing the 1983 and 1992 surveys: the prevalence of underweight children increased in all 11 regions surveyed. This is shown in Figure 1. The regions of Gonder, Gojam, Sidamo, and Welega had an underweight prevalence between 50% to 60% in 1992. These levels are among the highest prevalences reported in Africa, outside of refugee/displaced camp populations.

Stunting (low height-for-age) and wasting (thinness –low weight-for-height) have also been estimated. The mean prevalence of stunting for all the regions in 1992 was 64%. The regions with the highest rates (above 66% stunting) include South Gonder, East and West Gojam, North Welo, Tigray, Sidamo, Ilubador, North Gonder, and South Shewa. South Omo has the highest stunting, with 75% of its preschool children. Such levels of stunting are among the highest in the world, and almost certainly the worst in Africa. Stunting is already prevalent at early ages (6–11 months old infants), although the incidence of low birth weight (12–15%) is not especially high.

**Regions**

□ 1983 ■ 1992



**Figure 1.** Trends in Underweight Children 1983–1992, by Region

Sources: Central Statistical Authority (1993) and Pelletier et al, (1994).

Wasting levels are somewhat elevated in certain regions, compared to other Sub-Saharan African countries. The national average in 1992 was 8.7%, with regional values up to, for example, 14% in Tigray. Nonetheless, stunting is a far more widespread nutritional problem than wasting – both result in part from drought and poverty, with wasting often indicating acute situations.

Analysis of the 1992 survey looked into certain factors associated with child growth failure (stunting or underweight). While some associations were found, these varied (including in direction) widely by regions, and more impressive were the variations due to other, non-income factors.

For example children in Gonder, who were observed to have relatively higher prevalences of underweight, were reported also to have very high morbidity rates—50% of children reported to be ill in the immediate two weeks prior to the interview. North Shewa on the other hand showed the least prevalence of underweight and among the lowest in terms of morbidity among the regions.

**Breastfeeding Weaning Practices and Child Nutrition.** Data on breastfeeding and child weaning practices in the 1992 Nutrition Survey indicate that the problem of early stunting in Ethiopia is due in part to delayed introduction of complementary foods in the first year of life. Associations could be shown between age of introduction of such foods and stunting prevalences. While the recommended age for introducing weaning foods is 4–6 months, the national median was about 7.1 months, with some regions such as North Gonder and Tigray with averages of 12.1 months.

### **Factors Affecting Trends in Nutrition**

**Incomes and Poverty.** With a GNP per capita in 1993 estimated at U.S.\$100, Ethiopia is one of the poorest countries in Sub-Saharan Africa. Per capita GDP declined at an annual rate of –2.5% between 1986 and 1993.

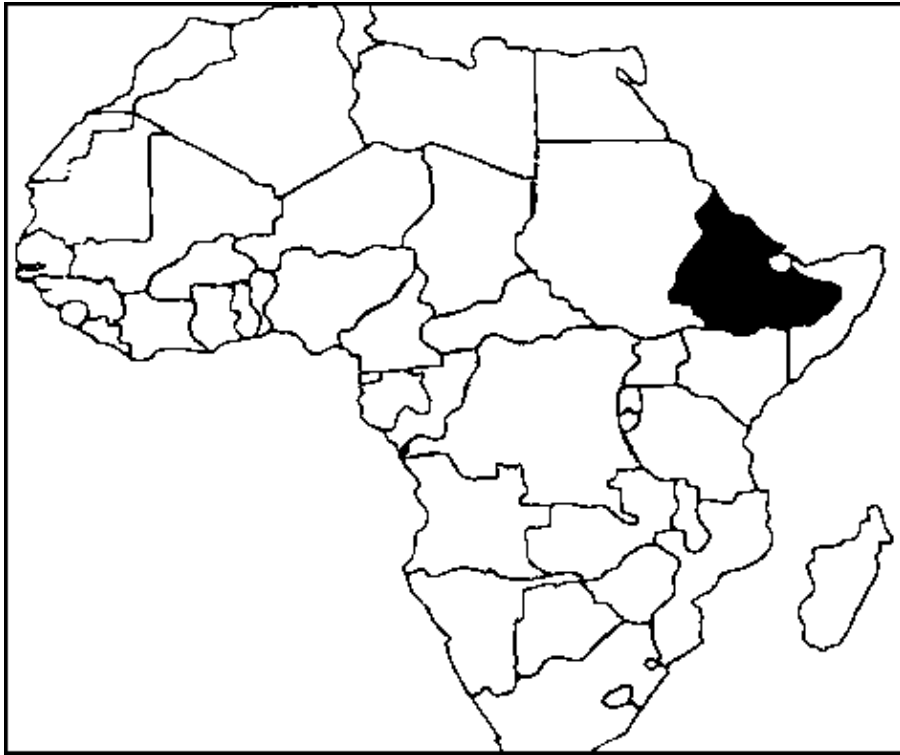
More than 51% of the population is considered to be below the poverty line, or 27 million people. These people live mostly in rural areas. A substantial number are in transit camps as displaced persons due to recent civil disturbances. The main groups identified as belonging to the poor included those coming from self-employed groups in remote rural areas in the central regions, returnees following the civil war, displaced persons, demobilized soldiers, the poor nomadic populations, the female-headed households in both rural and urban areas, and the low level government workers.

For the last decade or so, the economy has been characterized by decay and stagnation with per capita real incomes declining consistently since 1987. This appears, however, to have reversed in 1992/93 with the economy registering a growth of about 7.6%, generally coming from growth in agriculture, with improved rainfall and some effects from reforms, which boosted output via improved producer prices and market access. Since 80% of the labour force depended on agriculture, the trends in incomes and poverty depended to a large degree on that sector's performance. Nearly all of its export earnings come from coffee, and some from skins and hides of animals.

Transitory problems have compounded the chronic poverty situation in the country. Ethiopia's Relief and Rehabilitation Commission estimated that in 1992, a total of 6.2 million people required food aid. This was reduced to about 4.2 million in 1993. Intermittent drought particularly in the north and northeast, and civil war, which disrupted large areas of the country, are major causes. It is estimated that 1.7 million people of the 6.2 million in need of food aid in 1992 were refugees and displaced persons caused by the civil disturbance.

**Food Security.** Ethiopia's food security has been constantly eroded by progressive soil exhaustion, and overcrowding of land, which has caused declining food production per capita since 1960s. As a consequence, Ethiopia's production of the main cereals (barley, maize, sorghum, and teff) fell short and the country depended on imports averaging 100,000 MT per year in the 1980s, increasing to 1 million MT in 1990 and 1991/92. Food supply per capita has been deteriorating, and this has resulted in a low calorie supply per capita of less than 1700 kcals, one of the lowest in the world. The regions of Sidamo, Hararghe, Gamo Gofa, and Wollo experience more food security problems and are prone to crisis situations.

**Health and Other Factors.** The level of health service support has been rising, but by 1991, only 37% of infants had been immunized against DPT—still lower than most areas on the continent. Governmental health service provision is estimated at about \$1.44 per capita and around 3% of the national budget expenditures. Attendance in primary schools is very low, at 36%, and fiscal data indicate that the proportion of government expenditures for education has been declining.

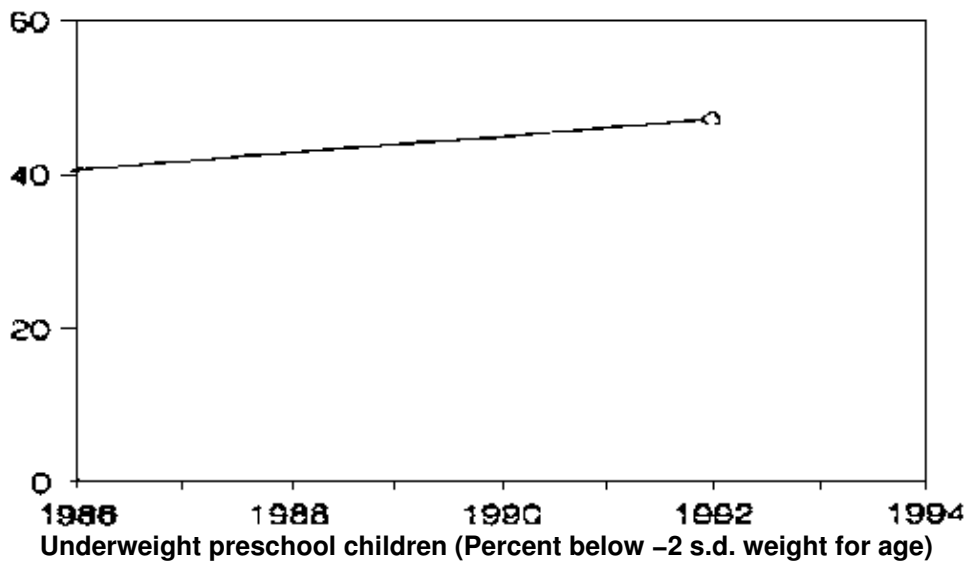


**ETHIOPIA**

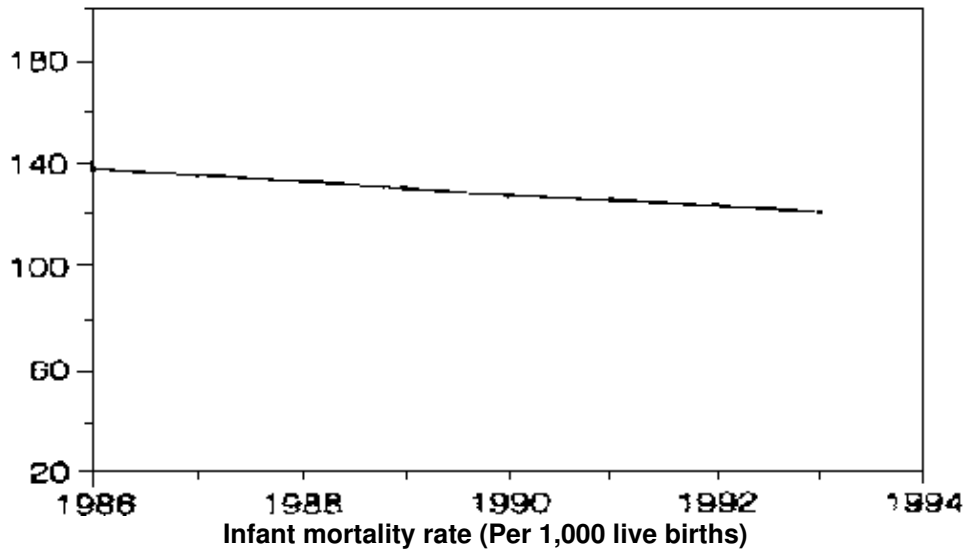
**(Estimates in 1993)**

Population	: 53 million
Population Density	: 43 per sq. km.
Population Growth Rate	: 3.4% per annum
Urban Population	: 13%
IMR	: 120
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 100
PPP estimates of GDP (\$ Per Capita, in 1991)	: 370

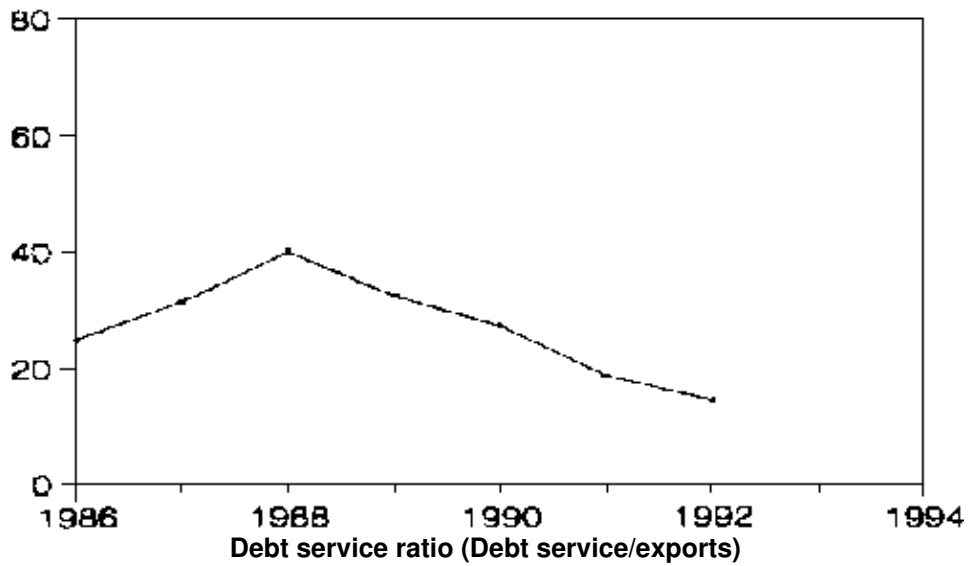
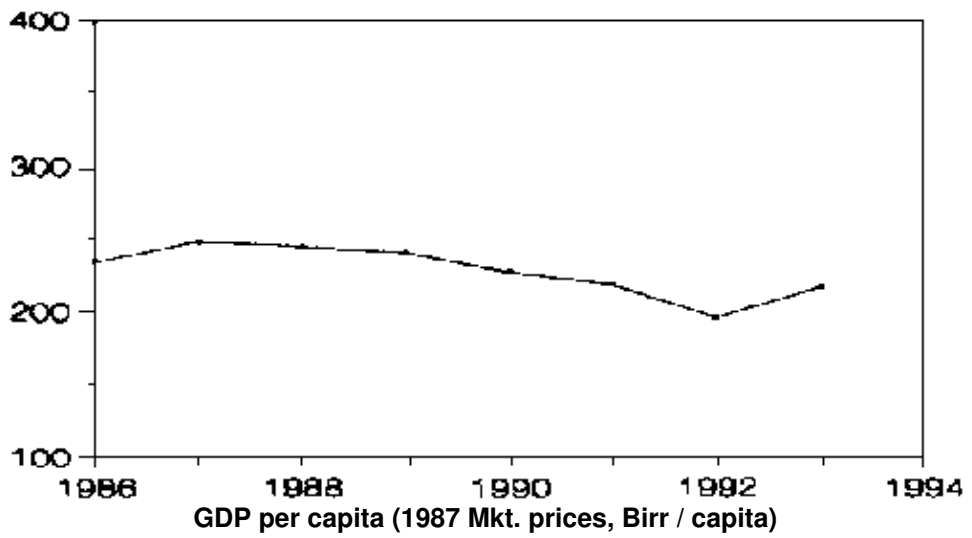
**CHILD GROWTH AND SURVIVAL**



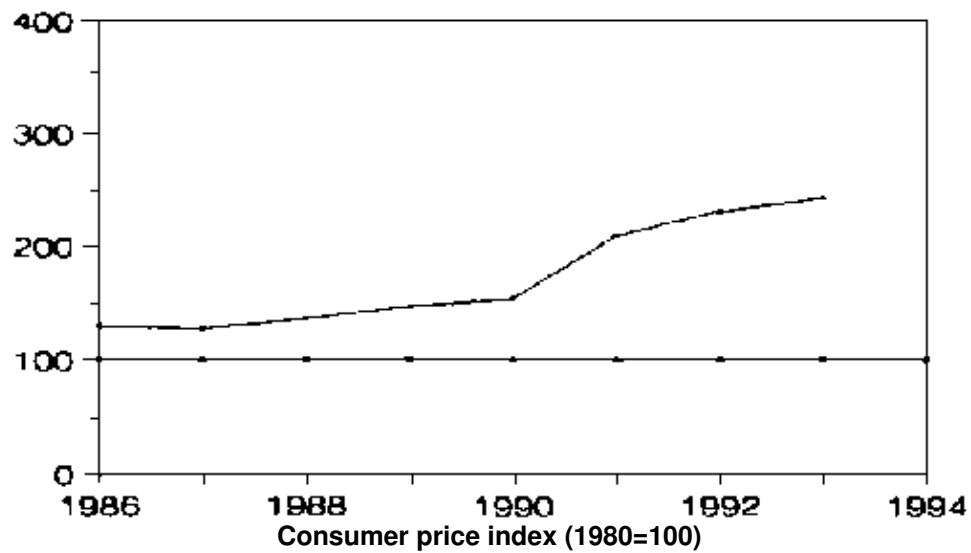
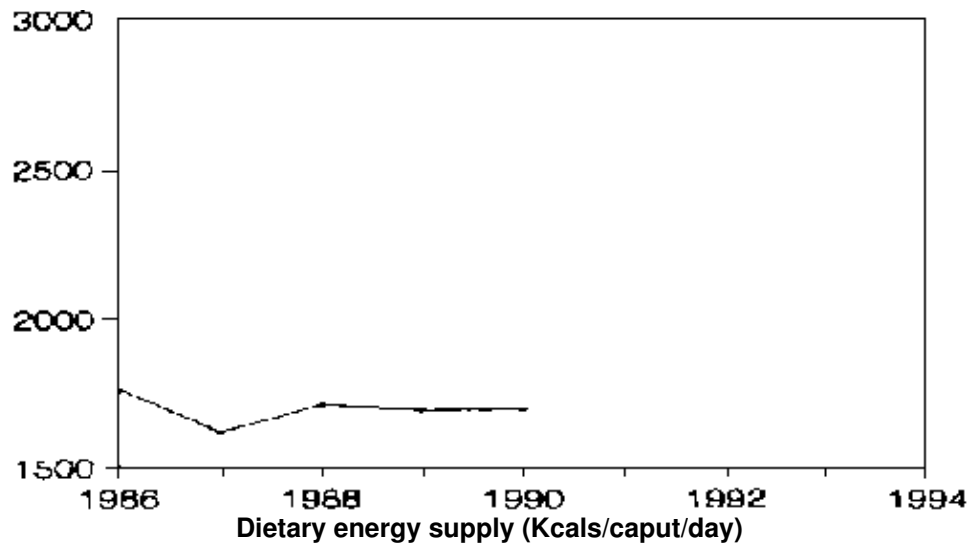
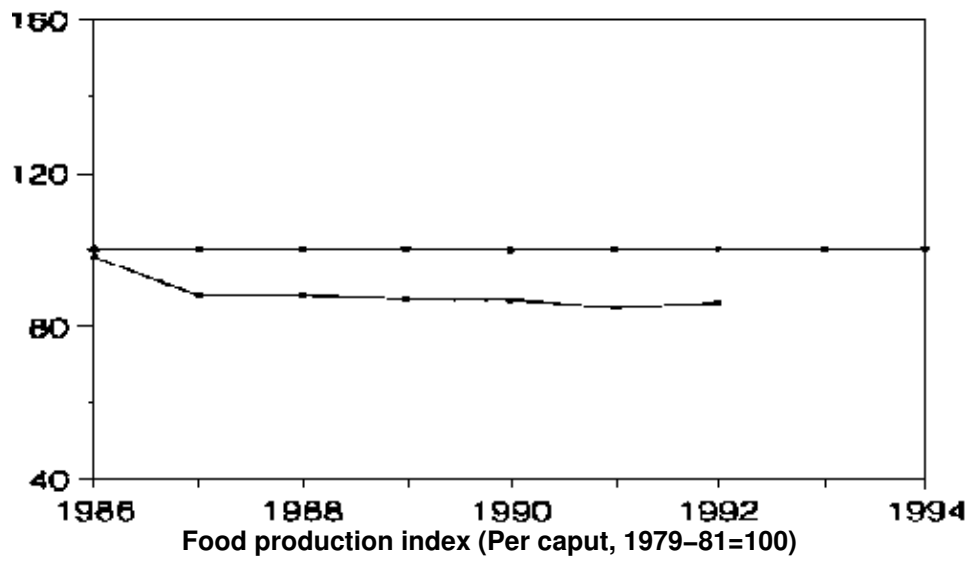


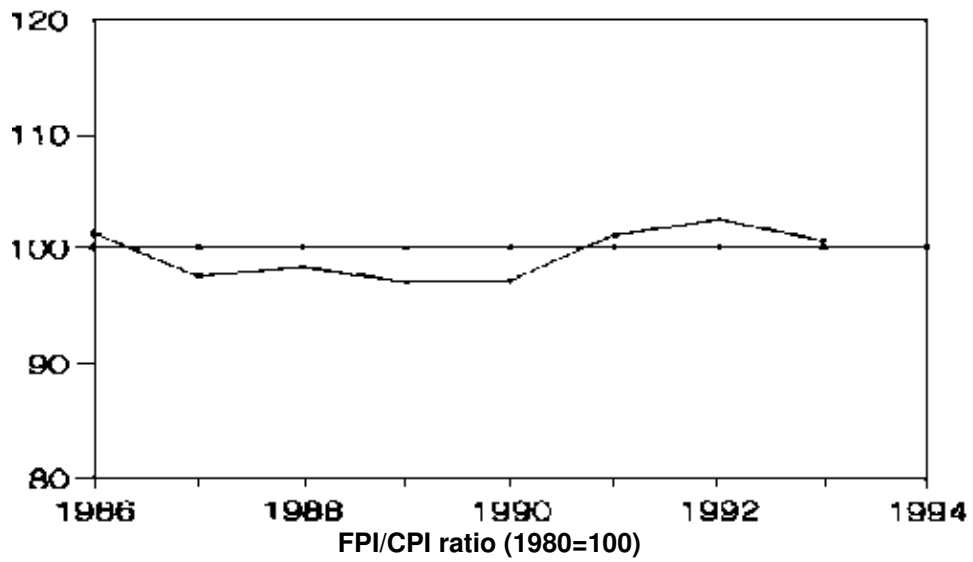


## ECONOMICS

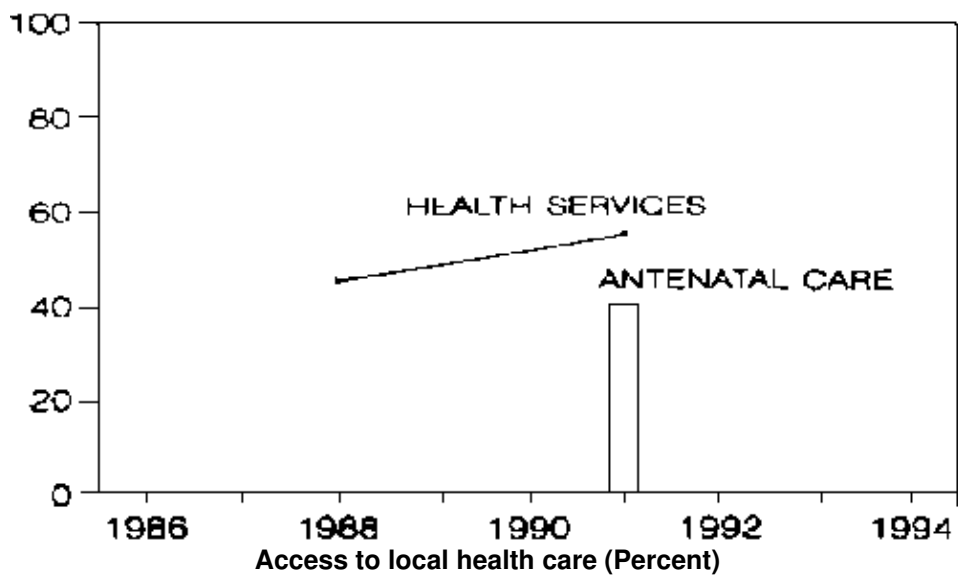
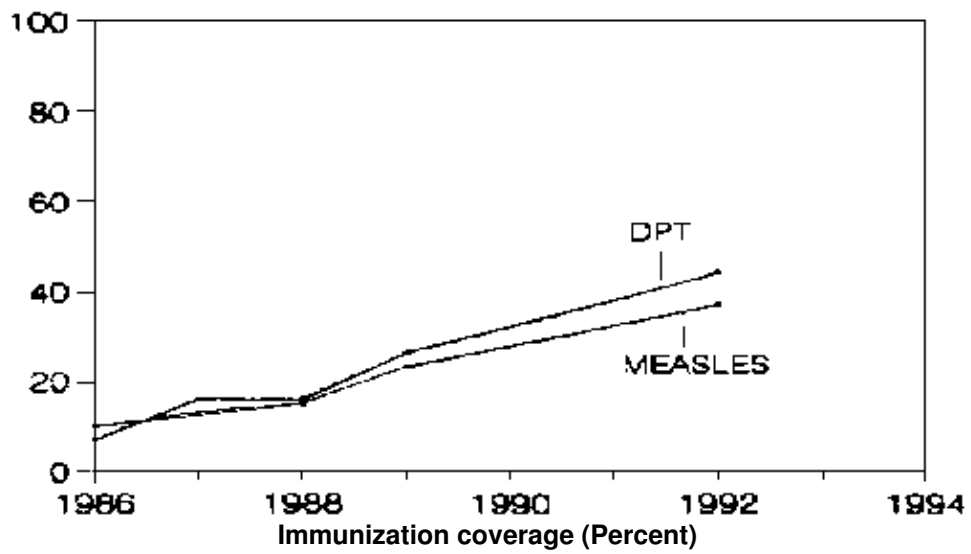


## FOOD

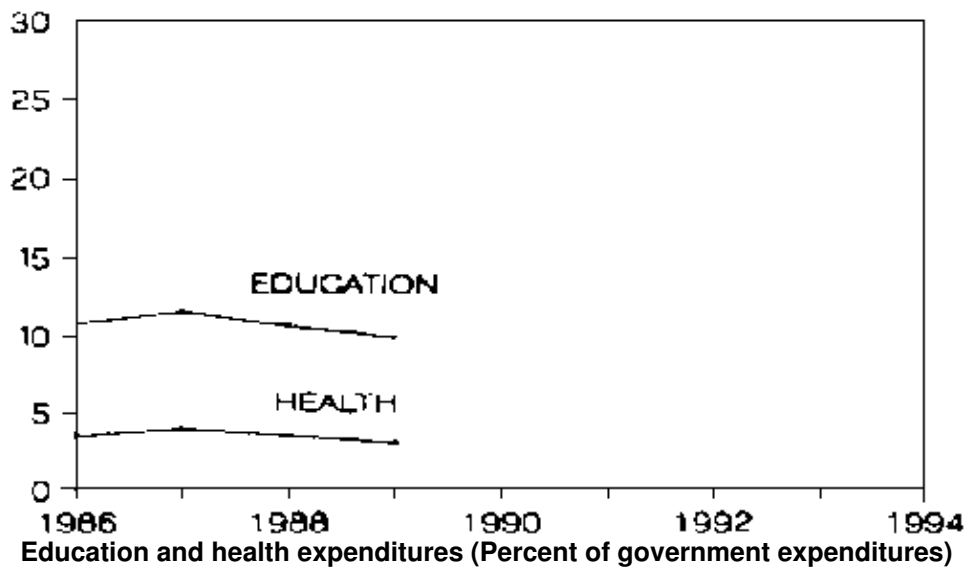
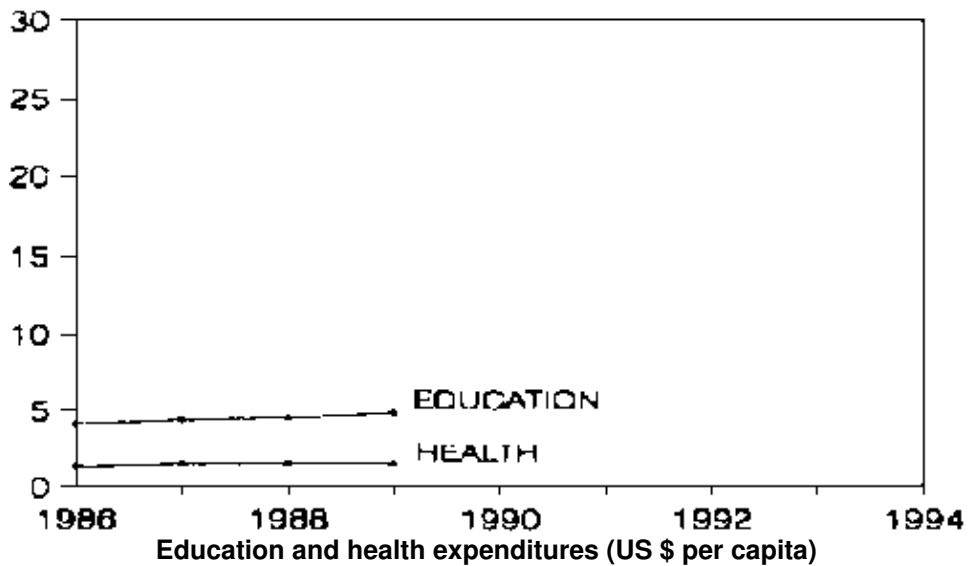




## HEALTH



## PUBLIC EXPENDITURES



With its large population of 53 million in 1993, and with 4.6 million of its 9.7 million preschool children underweight, malnutrition remains one of the biggest socio-economic problems in Ethiopia.

### Further Analysis<sup>1</sup>

1. Text of this section was contributed by D. Pelletier, Cornell University

The 1992 rural nutrition survey results have a number of further implications for policy and analytical work. First, they emphasize that the relationship between agricultural production, food security and child nutritional status at the national, regional and household levels is not as close as widely believed. Future policy analysis should be based on a consideration of all three underlying causes of malnutrition – food security, health and child care/feeding – and the effects each has on the other.

The national survey and a large number of local surveys reveal that infant feeding practices, including late initiation of breastfeeding, widespread use of purgatives immediately after birth, use of liquids throughout infancy, and late introduction of complementary foods should be considered intervention priorities. Rates of infection are very high and typical of those found in other countries, and coverage of improved water and sanitation facilities is very low.

Demands on women's time have been shown to be considerable and this is likely to be a major factor constraining efforts to improve infant and child feeding practices. The design of agricultural, food security and rural development programs should avoid increasing demands on women's time and, if possible, attempt to reduce such demands so as to enhance the ability of households and communities to implement improved child feeding and caring practices. This is especially relevant at the present time, in light of the extensive use of labor-intensive public works being discussed in country.

## India

India is a nation of 901 million inhabitants as of 1993, the second most populous in the world. Population is growing at 2.1% per annum. With a per capita GNP of U.S.\$290 in 1993, it is one of world's poorest countries and accounts for about one-third of the world's absolute poor. Nutritional and related data up to around 1990 were given in the ACC/SCN's Second Report on the World Nutrition Situation (vol.II, p9–15, 1993).

### Recent Trends in Nutrition

Nutrition surveys were conducted in eight states in 1991/92 by the National Nutrition Monitoring Bureau (NNMB, Hyderabad) and they provide the most recent estimates of the nutrition situation. Sampling techniques varied between the 1991/92 estimates and those done previously in 1988–90. In interpreting trend data, it is also important to keep in mind that nutritional levels are sensitive to short-run shocks (e.g. a bumper crop was harvested in 1989).

Most commentators feel that in view of the uncertainties, it is probably reasonable to conclude only that the average trend from 1975 through to 1992 is likely to be of improvement. The national and state-wise trends cannot be accurately updated for 1988–90 to 1991–92. Thus the most recent definite estimate remains as shown in the Second Report on the World Nutrition Situation, Volume II, p. 13 (ACC/SCN, 1993). New data from a national survey carried out in 1993, in collaboration with DHS, are expected soon, which may allow further state-wide comparisons over time. With this in mind, some qualitative implications are as follows.

The tentative results from comparing 1988–90 with 1991–92 suggest some possible deterioration in the nutritional status of children (1–5 years old) in three states, Karnataka, Maharashtra, and Gujarat, and static situations in Kerala, Tamil Nadu, Andhra Pradesh, and Orissa. This deterioration in Karnataka and Maharashtra could be judged statistically significant, but this was not the case for Gujarat. Seven states had information from both the earlier survey (1988–90) and the later survey (1991–92). Combining the trends of the seven states, weighted by their population, indicates that the average prevalence of underweight children (<75% of NCHS standard) increased from 53.3% to 56.6%. This trend would reverse some of the gains made in the previous decade, particularly those in Maharashtra and Karnataka.

### Factors Affecting Trends in Nutrition

**Economic Growth.** While the most recent economic data show positive trends, the period around the time that the latest nutrition survey data were available (1991–92) was a period of economic crisis in India. The crisis, starting in 1990, reached its peak in the summer of 1991 when foreign currency reserves had declined to almost \$1 billion, inflation had risen to an annual rate of 17%, industrial production was falling, and overall economic growth had declined to 1.1% in 1991/92. By comparison, the economic growth rate in the 1988–90 period was estimated at 5.4%.

The programme of stabilization and the economic reform measures put in place in 1991/92 helped restore economic growth to 4% in 1992/93, brought down the inflation to 7%, restored the foreign currency reserves to \$6.4 billion and stimulated a strong recovery in exports towards the end of the financial year. FY92/93 marked the first full year of the sweeping adjustment program undertaken in India—aimed at restoration of macroeconomic stability and broad based liberalization of the economy. With the revival of the economy in 1992/93, it is expected that the nutritional status of the population should improve.

**Food Security.** India's agricultural sector contributes about 30% of GDP. Large public investments in irrigation infrastructure and research, coupled with land reform that would give ownership of land to the landless, the introduction of high-yielding seed varieties, and expanded use of fertilizer, have resulted in some notable achievements – including self-sufficiency in rice, wheat, coarse grains, sugar, and edible oils. But while these longer term gains in agricultural output continue (see food production index), year to year highs and lows are still dependent on the weather conditions for most of the country. The vagaries of the monsoon cause large fluctuations in agricultural production from one year to another. And since agriculture remains as the backbone of the economy, the annual changes in this sector affect the domestic product from year to year.

For example, agricultural production data for the 1990–91 period indicate low gains due to low rainfall, particularly in Karnataka and Maharashtra. Total foodgrain production in Karnataka declined from 7.1 million MT in 1989/90 to 6.3 million in 1990–91 before recovering to about 8.4 million in 1992–93. Since two-thirds of

the population is still dependent on agriculture for their livelihood, the low agricultural output could have contributed to any deterioration in nutritional status of children.

The production of foodgrains during 1992/93 reached a record level of 180 million MT, which was higher by about 7% over the previous year. This was mainly due to a quantum jump in the production of coarse cereals, which was higher by 11 million MT over 1991/92. The production of wheat also increased to 56.8 million MT in 1992/93, a 2% increase over the previous year output. The food production per caput index (with 1979–81 as base=100), indicates an increase from 110 in 1986 to 123 in 1993.

**Household Food Security.** Changes in agricultural output can explain the overall food availability situation in the country, but not necessarily of the food security situation at the household level. Changes in incomes, poverty, and food prices affect the ability of households to acquire food. The NNMB surveys include food consumption indicators. The data for 1991/92 show that it was indeed a bad year for household food intakes in most of the eight States that it surveyed. Compared to 1988/89, average calorie intakes declined in six of the seven States, with the deepest deterioration occurring in Karnataka and Gujarat. These trends are consistent with the anthropometric data cited earlier.

In India, alleviation of poverty and unemployment continue to be the long run objectives of economic and social development in India. The Indian Planning Commission estimated in 1987/88 that 29.9% of population lived below the poverty line with 33.4% in rural areas and 20.1% in urban areas. The Expert Group of the Indian Planning Commission found a steady decline in the proportion of population living below the poverty line. Essential commodities such as rice, wheat, edible oils, and kerosene are distributed through the PDS (Public Distribution System) at prices generally lower than the market price, through an elaborate network of fair price shops (FPS). Wheat and rice, the two primary staple foods consumed in India, are the two main cereals distributed through the PDS. As of March 31, 1993 there were more than 400,000 FPSs in the country; 313,000 in rural areas and 96,000 in urban areas. On an average, one fair price shop is required to cover a population of 2000. Even though the supply of PDS items is supplementary in nature, it has helped in protecting the real purchasing power of some of the vulnerable sections of the population.

**Nutrition and Social Programmes.** The adjustment programs that started in 1992 adopted a new outlook with respect to many of the socially-oriented programs in the country. The government recognized that social sector support is a high priority needed to protect disadvantaged groups during the adjustment period. The new initiatives sought to improve the quality of human resource programs, such as the Integrated Child Development Services (ICDS), and improve its efficiency in reaching the poor.

The most recent data indicate that while about half of India's 5,300 district blocks are now reached by the ICDS program, its effectiveness in dealing with the problems have been hampered by a number of implementation weaknesses that are being remedied by some institutional and policy changes. While improvements were seen in nutrition in the 1980s, it was evident that gains were made especially in the wealthier States (with the notable exception of Kerala).

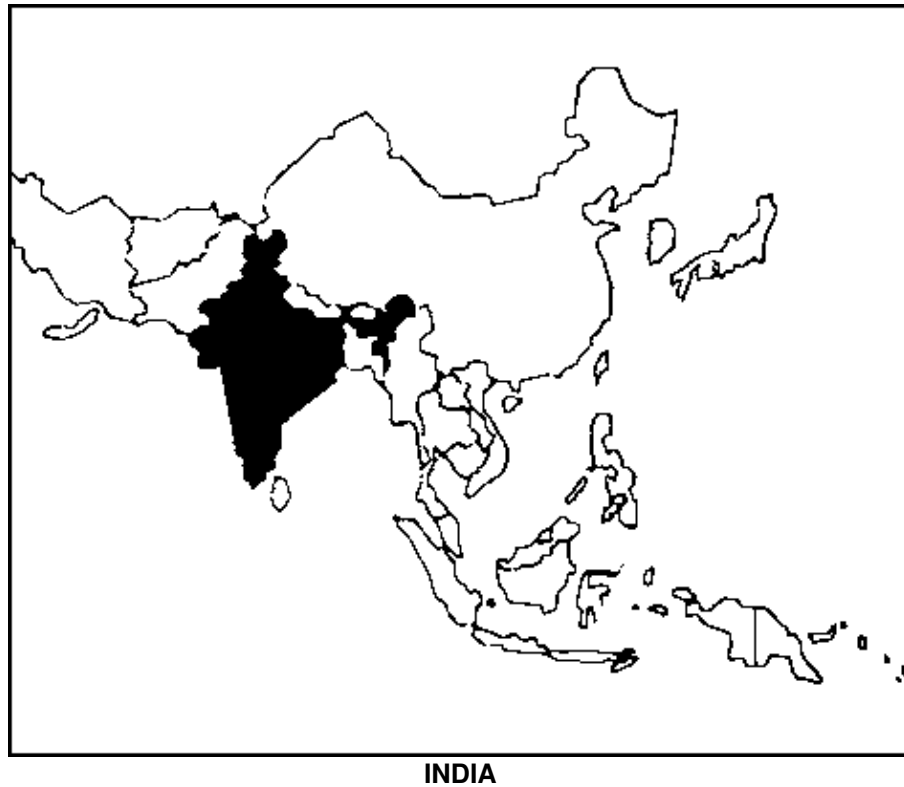
A number of reforms in the ICDS program implementation were sought during the adjustment transition period. One shortcoming in the program is the poor targeting of program allocations from the central government. Second, while the central government bears most of the cost of the ICDS program, a number of the States fail to allocate sufficient funds for food supplements required under the program. Furthermore, a review by the World Bank on the monitoring of the ICDS indicates that it focuses more on the inputs (such as number of feeding days) rather than outputs (such as number of children who are brought out of malnutrition). Moreover, difficulties are experienced in focussing on the most vulnerable age-group, those children under three years of age.

In the adjustment transition period beginning in 1992, the government has instituted reforms by increasing the level of effort of ICDS in 180 most-in-need districts where infant and maternal mortality rates are highest. There are plans to include adolescents in the program coverage, and to provide iron and food supplements.

## Conclusions

The indications are that nutrition improvement in India may have faced reversal in the early 1990s, related to economic problems and other factors. With economic growth reviving, nutrition should improve also. However, the underlying rate of improvement is slow, probably around 0.5 percentage points per year, at a level of about 65% prevalence of underweight.

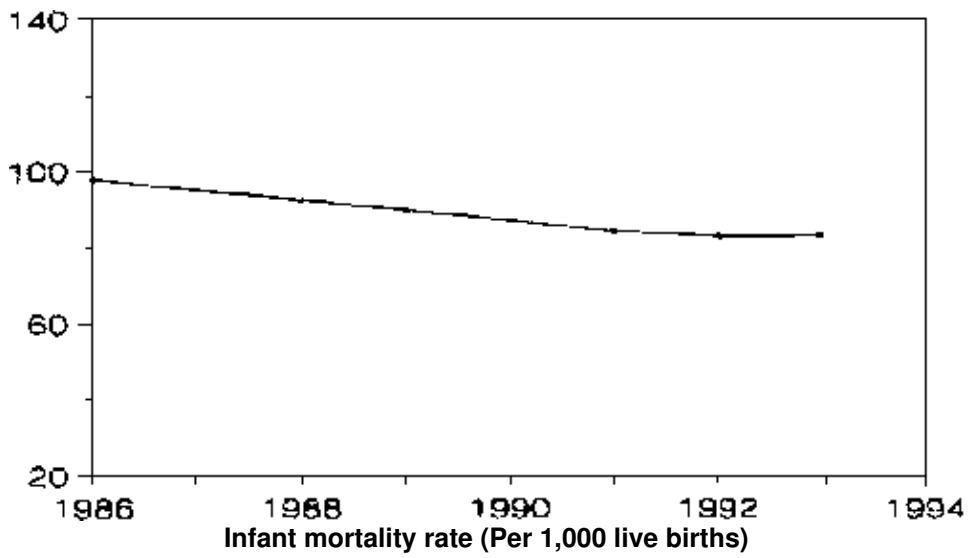
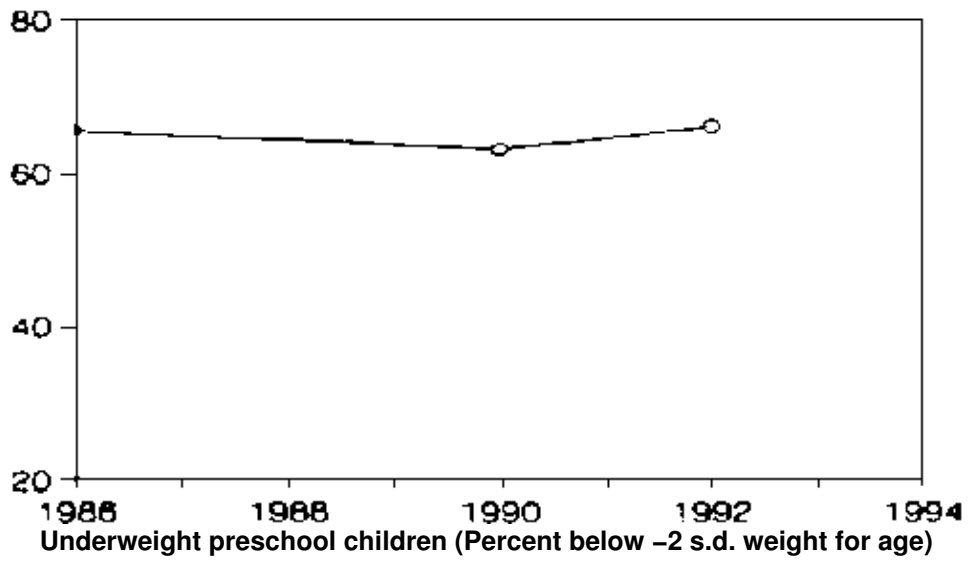
Accelerating this rate would likely benefit from more priority to health education and poverty alleviation, and more effective nutrition interventions, e.g. through the ICDS.



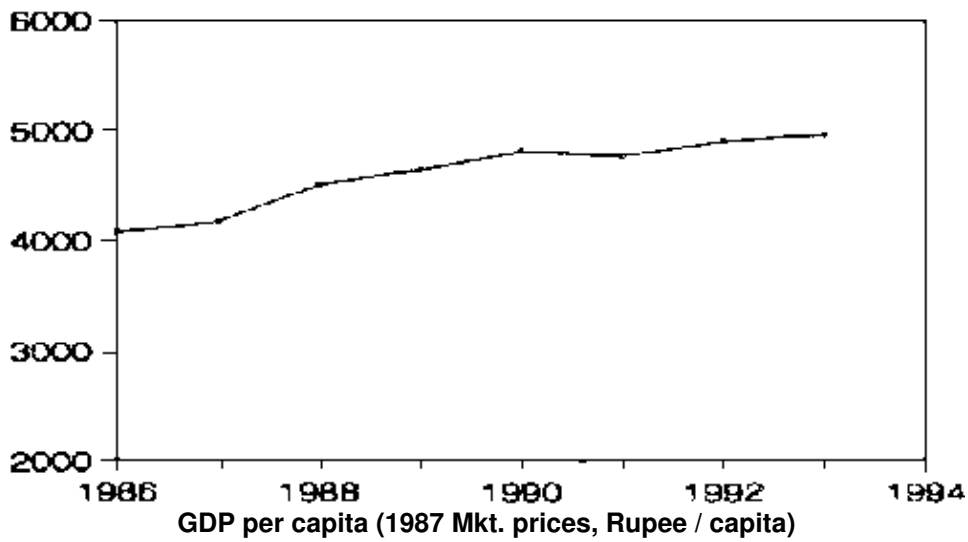
**(Estimates in 1993)**

Population	: 901 million
Population Density	: 264 per sq. km.
Population Growth Rate	: 2.1% per annum
Urban Population	: 27%
IMR	: 83
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 290
PPP estimates of GDP (\$ Per Capita, in 1991)	: 1150

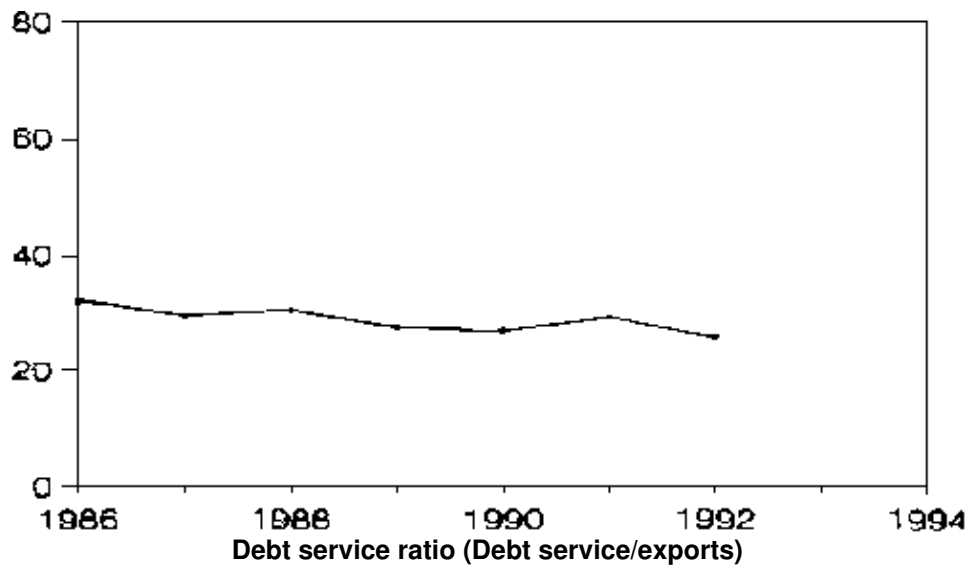
**CHILD GROWTH AND SURVIVAL**



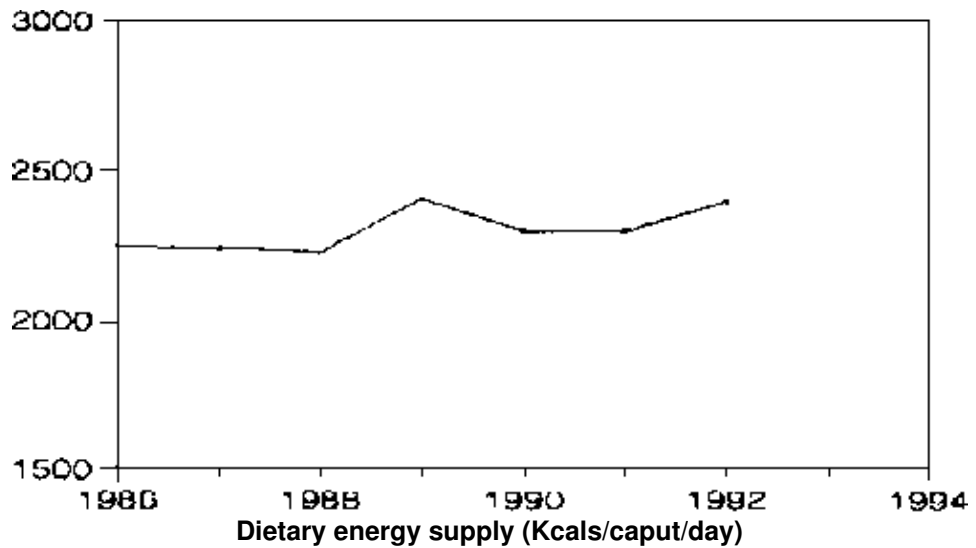
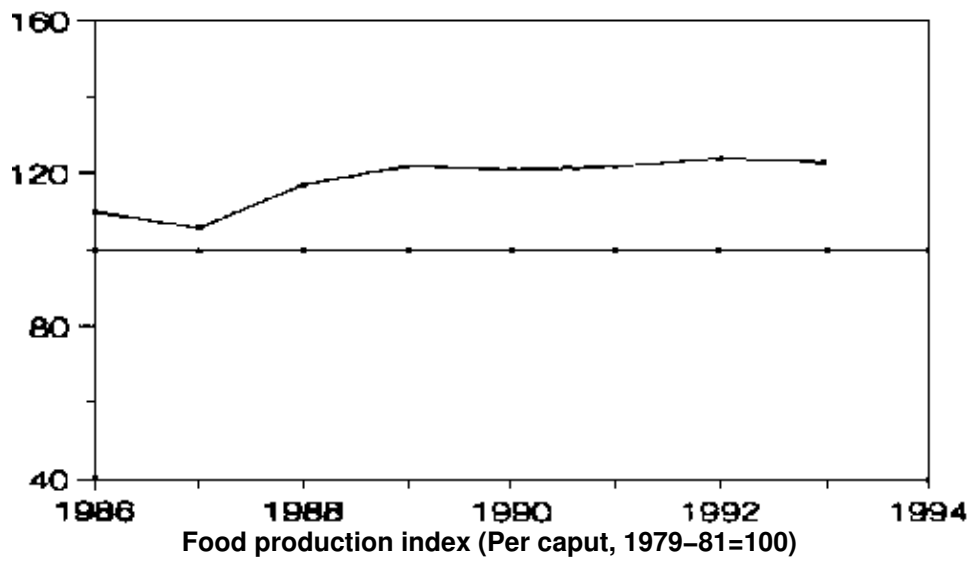
**ECONOMICS**

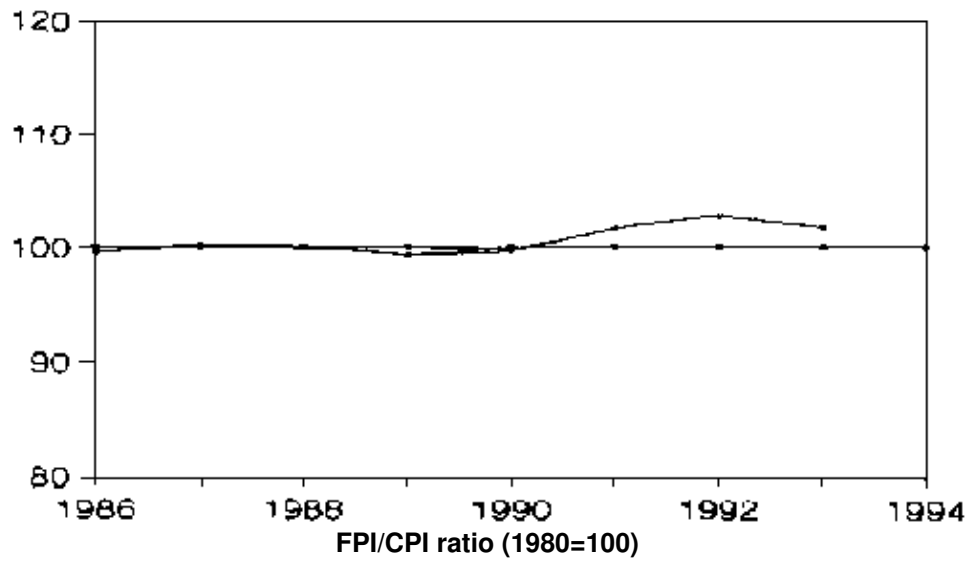
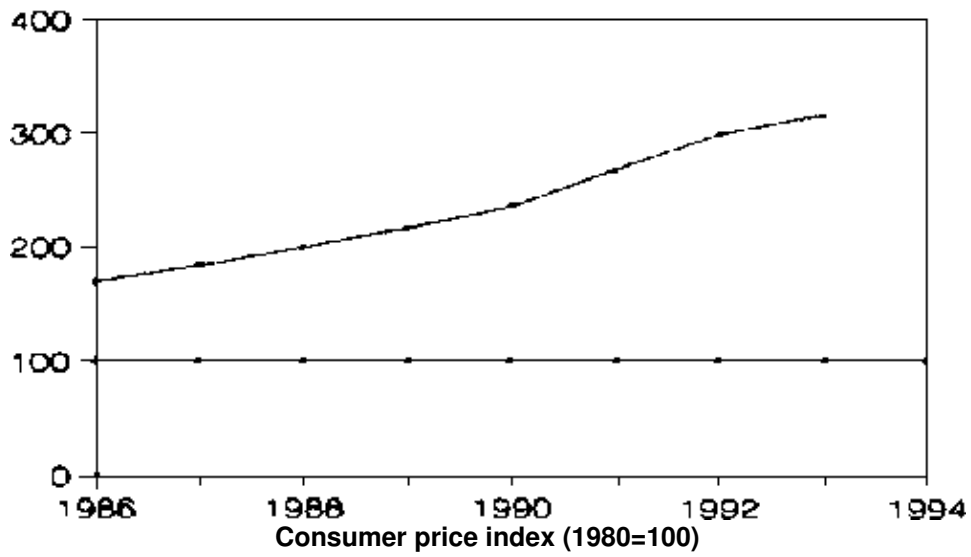




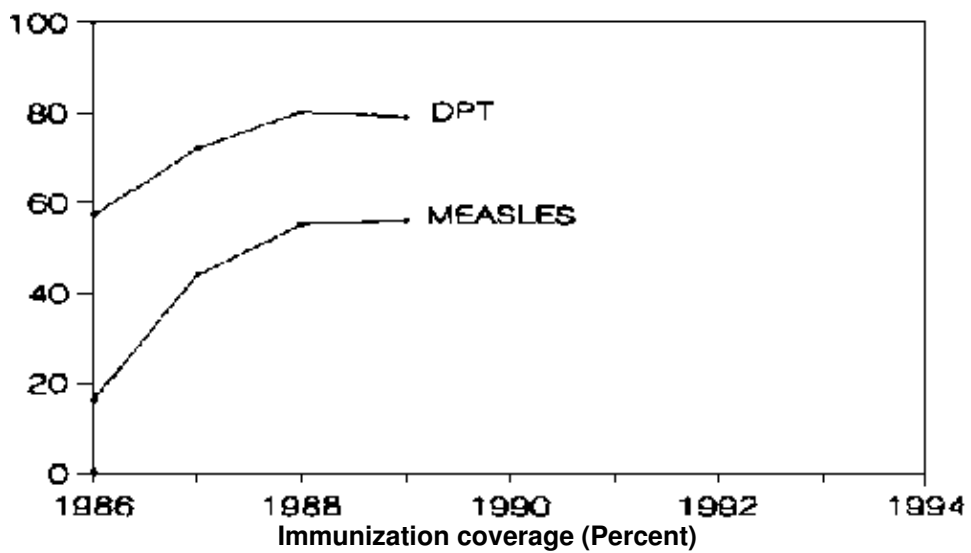


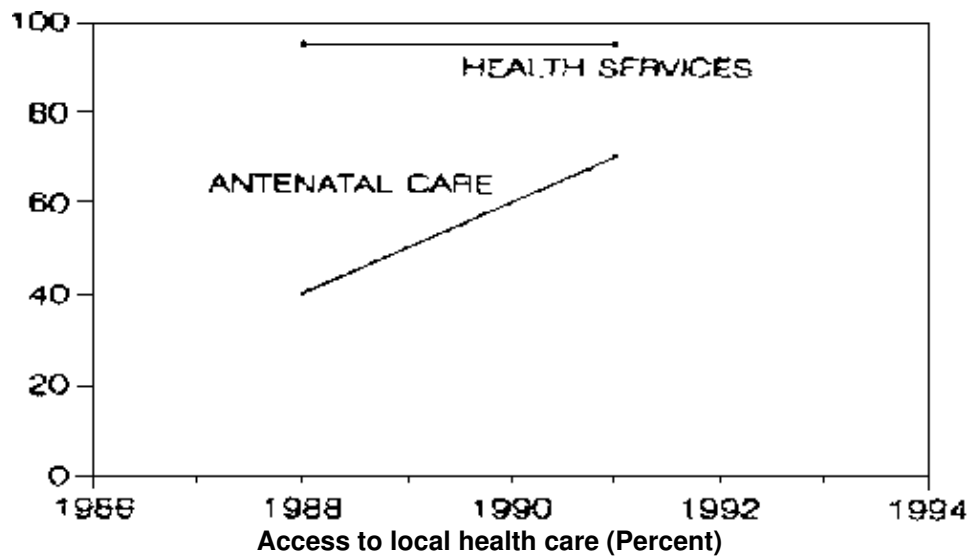
FOOD



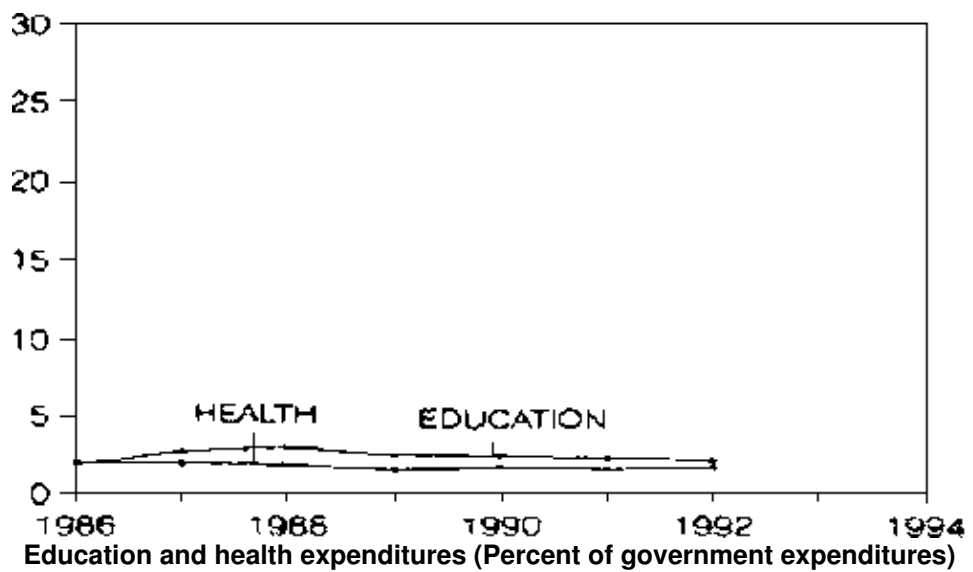
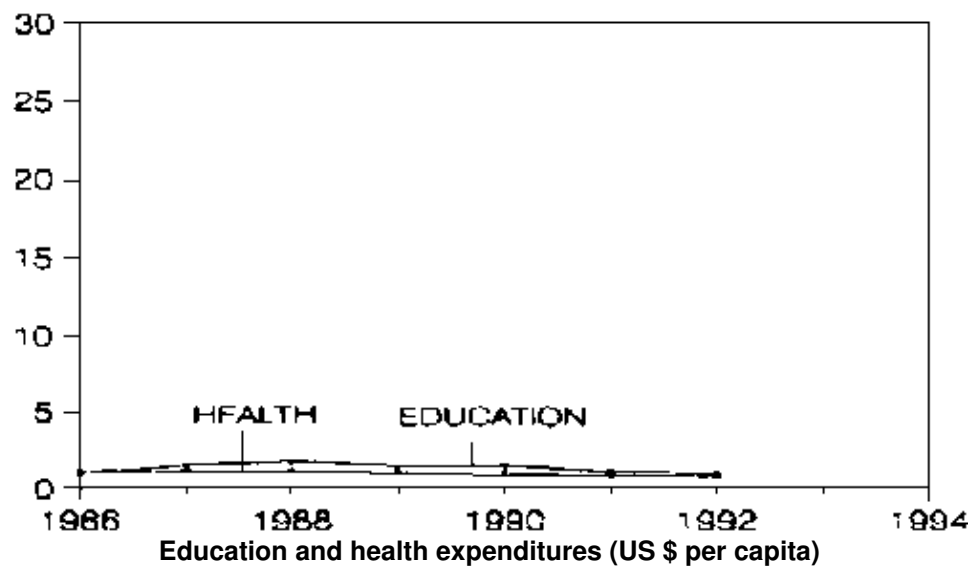


HEALTH





**PUBLIC EXPENDITURES**



## Kenya

Kenya is a low income country with a per capita GNP of U.S.\$270 in 1993. Population was 27 million in 1993 and population is growing at the rate of 2.9% per annum. The nutrition situation in Kenya up to around 1990 was described in the Second Report on the World Nutrition Situation, vol II, p.51–55. Results from a new nutrition survey (1993) make it possible to update the earlier report.

### Recent Trends in Nutrition

The most recent survey carried out by the National Council for Population and Development and DHS in 1993 indicates static or worsening nutritional conditions amongst children compared to the 1987 national rural survey. The prevalence of stunting (less than  $<-2$  s.d. height-for-age) in 1987 was estimated at 32.2%, and increased nationally to an average of 33.7% in 1993. These new data are an indication of reverses in gains in nutrition that were reported in the previous decade. In absolute numbers, the stunting problem now affects 1.7 million preschool children, compared to 1.3 million in 1987.

Surveys of child nutrition have been carried out in Kenya since 1977. Seasonality varies greatly across the country, so that stunting has been more often used than underweight to make comparisons through time. Calculation methods have evolved, notably moving from a cut-off of 90% for height-for-age, to  $<-2$  SDs. An estimate of national stunting trends in children 0–59 months can be represented thus:

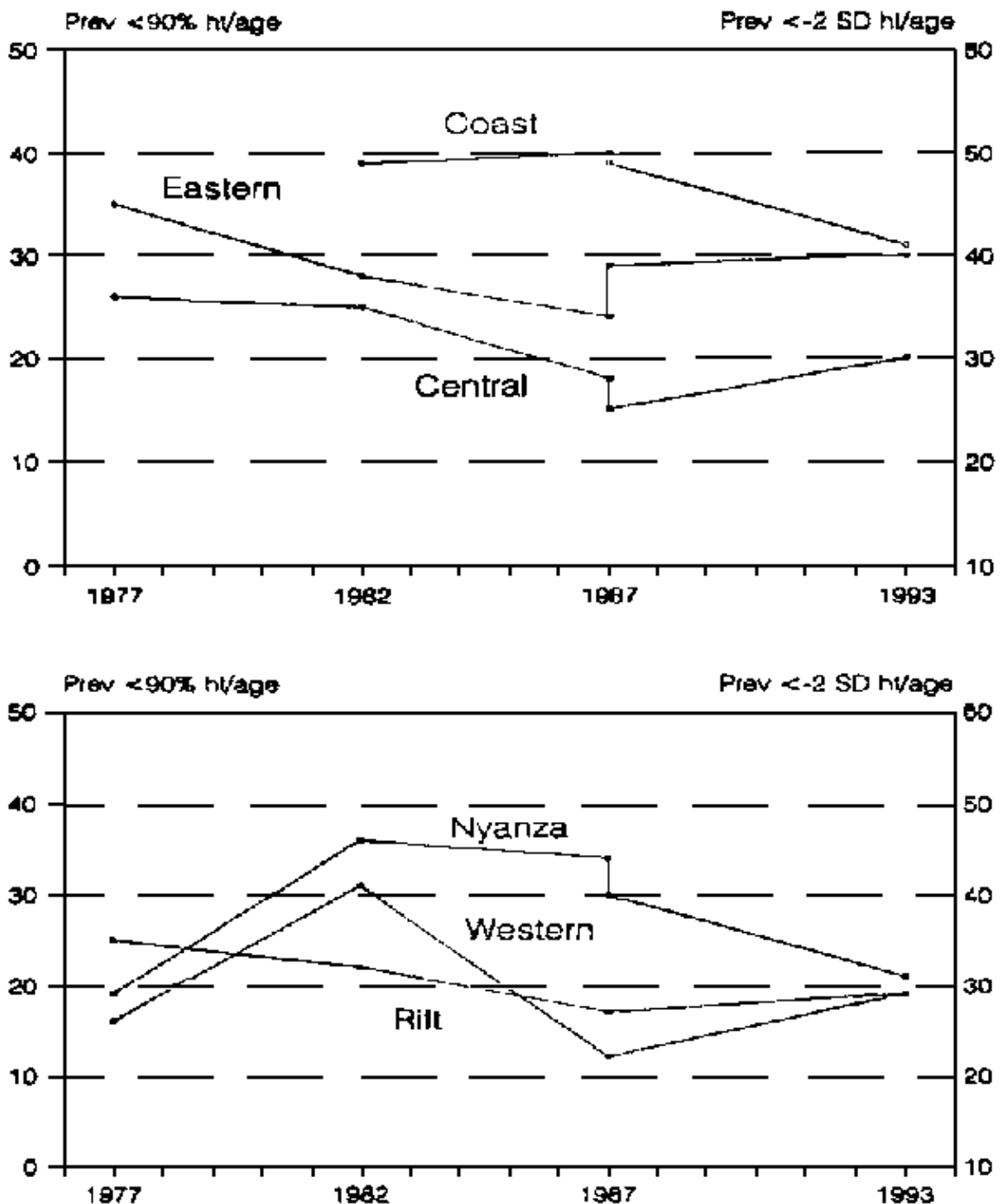
	1982	1987	1993
H/A $<90\%$	27.0%	23.0%	–
H/A $<-2$ SDs	–	32.2%	33.7%

This indicates improvement in the mid '80s, then deterioration 1987–1993. A similar issue applies to underweight prevalences, but with recalculation the following trend in underweight seems plausible (and tells much the same story as stunting):

	1982	1987	1993
W/A $<-2$ SDs	22.0%	18.0%	22.3%

Trends in nutrition, assessed by stunting, have been uneven across provinces. These are shown in Figure 1.

In the Coastal province, where the highest proportion of stunting is found, there were improvements between 1987 and 1993 (from 50% to 41% – prevalences here expressed as  $<-2$  SDs height-for-age). Similarly, the province of Nyanza experienced notable improvements (40% to 31%). Significant increases in stunting were observed in the Western province (23 to 30%), the Central province (26% to 31%). In Rift Valley province stunting increased slightly. Stunting levels are now very similar, at around 30% ( $<-2$  SDs height-for-age), in Central, Rift Valley, Nyanza and Western provinces, with Coast and Eastern some 10 percentage points higher at about 40%.



**Figure 1.** Kenya: Trends in Prevalence of Stunted Children (12–59 months) by Province, 1977–1993

Note: Data for 1977, 1982 and 1987 were originally given as <90% ht/age. For 1987 these are also available as <-2 SDs (and plotted both ways) which is how 1993 are also calculated. To facilitate viewing trends in these plots, the <-2 SD scale (right hand vertical) is shifted +10% compared with the <90% scale.

Sources: 1977–1987 – see Second Report of the World Nutrition Situation; (1993), NCPD–CBS–DHS (1994).

The considerable regional variations are masked by the national averages. Yet, it can be broadly concluded that the improvements gained in the 1980s have been reversed, at least in part, during the early years of the 1990s.

#### Factors Affecting Trends in Nutrition

**Economic Growth.** Many factors may be responsible for the static or deteriorating nutritional conditions in Kenya. Whereas relatively good growth rates in the economy were experienced in the latter part of the 1980s, problems started to mount in the early 1990s. Per capita GDP growth was negative after 1990 through 1993.

External imbalances worsened due to the Gulf crisis, deteriorating terms of trade, and the withholding of balance of payments support to Kenya by multilateral and bilateral agencies since late 1991. Continuous monetary pressure has fueled inflation, from 15.6% in 1990 to 19.8% in 1991 and 29.6% in 1992.

The fiscal deficit grew to 7.1% of GDP in FY91 and is estimated to be 2.9% of GDP in FY92. The deficit target for FY92 was almost achieved through fiscal compression, but election related expenses and larger than anticipated export compensation payments threatened to swell the FY92 deficit to more than twice the 2% of GDP target. The economy is heavily dependent on agriculture, since it employs more than 80% of the labor force and contributes more than a quarter of the GDP.

**Food Security.** Large parts of Kenya are drought prone. A major drought in 1992/93 seriously affected the food supply situation. The food production index dropped to a historic low of 83 in 1993 (base 1979–81=100) a level even below that of the last major drought of 1984/85. Even the normally surplus regions (Rift Valley), and the marginally deficit areas (Western and Nyanza) entered maize deficit situations in 1992/93; and food security problems worsened in the chronically maize-deficient areas of the Coast, Eastern, and Northeastern provinces.

As a marginally food deficit country, Kenya is a regular importer of food grains. Historically, the government intervenes heavily in the foodgrain market, such that shortfalls in production are compensated by price supports and by imports. Food aid forms about half of total import requirements; the other half comes from commercial imports. The estimate of foodgrain production for 1993/94 was 2.2 million MT, compared to total requirements of 3.9 million MT, or a shortfall of 1.5 million MT to be filled in by imports.

The recent drought affected household food availability, and consumption was curtailed further by the rise in food prices. The ratio of the food price index to the consumer price index rose to more than 107, the first time since 1985. This rise means that households faced higher inflation in foodstuffs than other components of consumer expenditures. With 1990=100 as base, the food price index was reported at more than 240 in 1993 at the height of the drought, with a CPI of more than of 227. Moreover, wages have not been keeping up with prices.

No data on calorie consumption are available which reflect lower food availability due to the 1992/93 drought. The most recent consumption data of 2075 kcals per capita for 1992 is about the same level as 1986. Between 1986–92 there was some decline in calorie consumption.

**Health, Education.** The Kenyan Welfare Monitoring System data for 1992/93 indicate that the enrollment rates in Kenya are generally high by African standards. The net enrollment rates at the primary level was estimated at 73%, higher amongst higher income groups, but no significant differences between males or females. The secondary enrollment rates were, however, very low at a net of 11% for the entire population. There is high income effect in the secondary enrollment rates; the rates in the poorest income deciles were nearly 4% compared to 23% in the highest decile.

Reports on immunization coverage vary. Earlier reports were of falling coverage of, for example, measles immunization. Recent figures indicate an increase of this indicator from 60% in 1987 to 81% in 1992, this level being maintained in 1993.

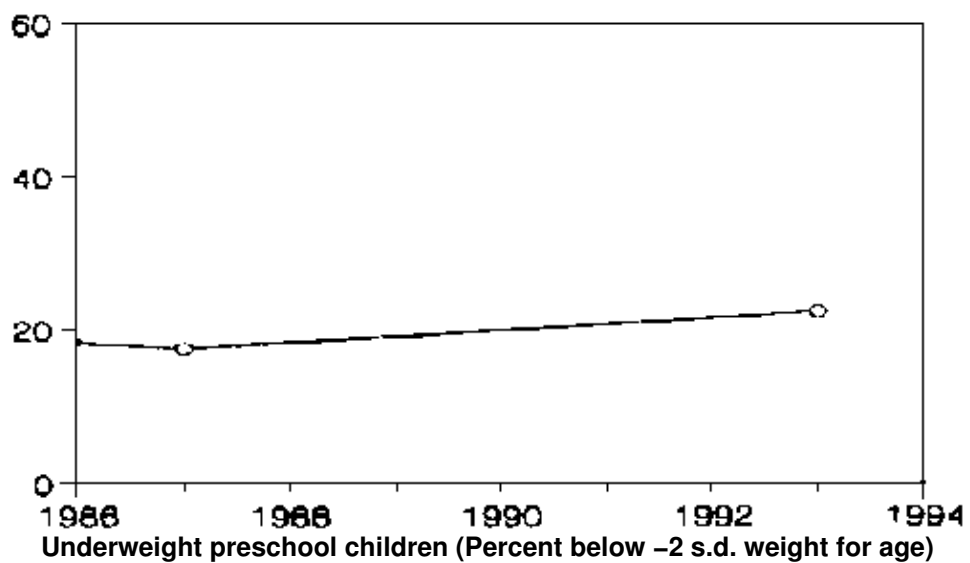


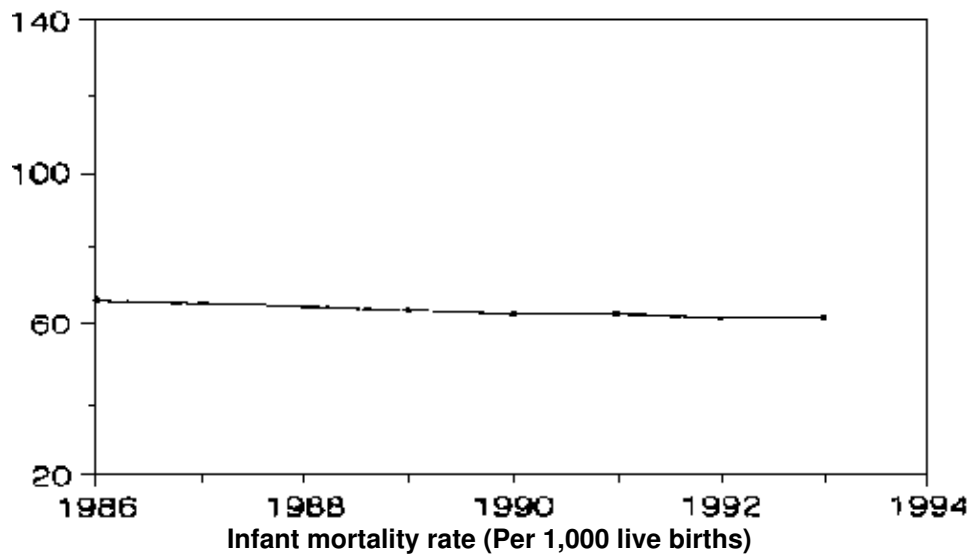
KENYA

**(Estimates in 1993)**

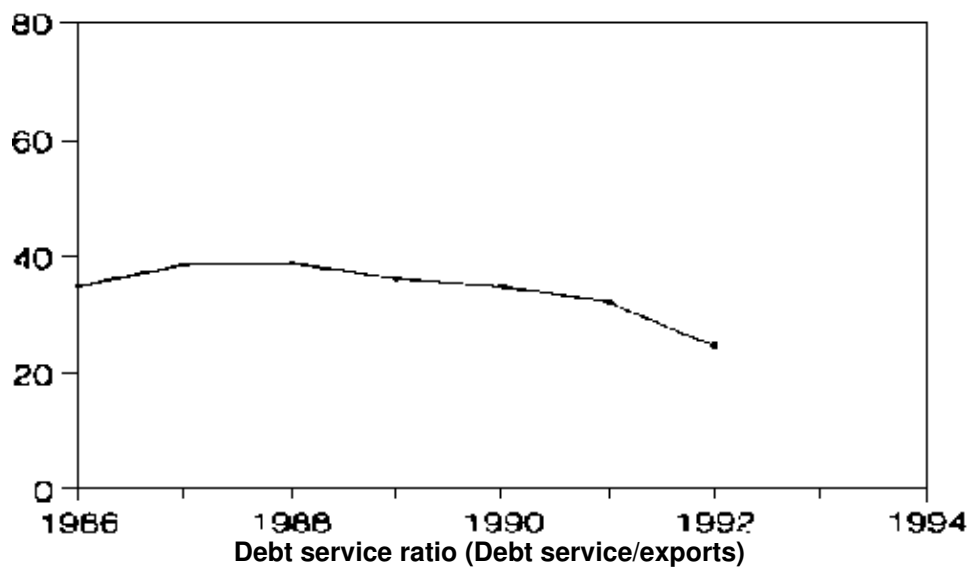
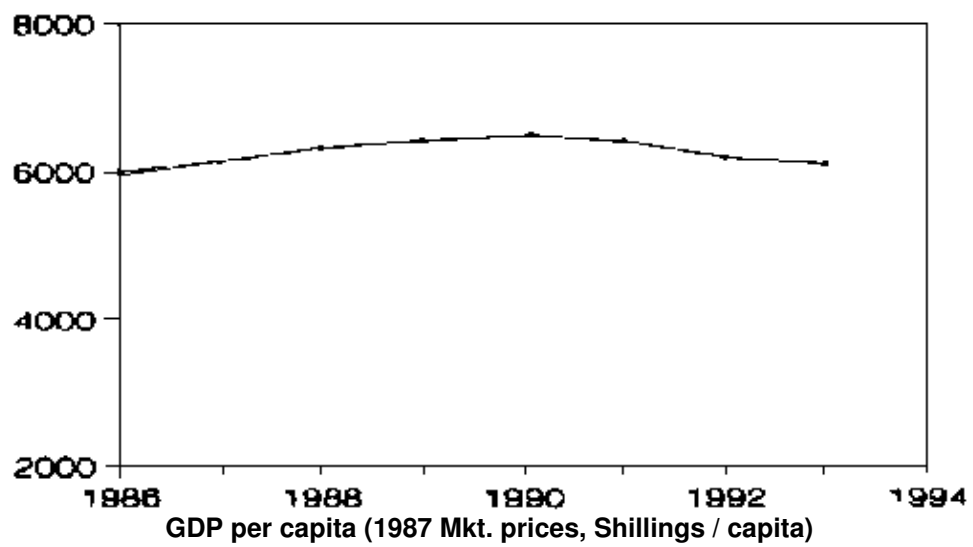
Population	: 27 million
Population Density	: 43 per sq. km.
Population Growth Rate	: 2.9% per annum
Urban Population	: 26%
IMR	: 61
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 270
PPP estimates of GDP (\$ Per Capita, in 1991)	: 1350

**CHILD GROWTH AND SURVIVAL**



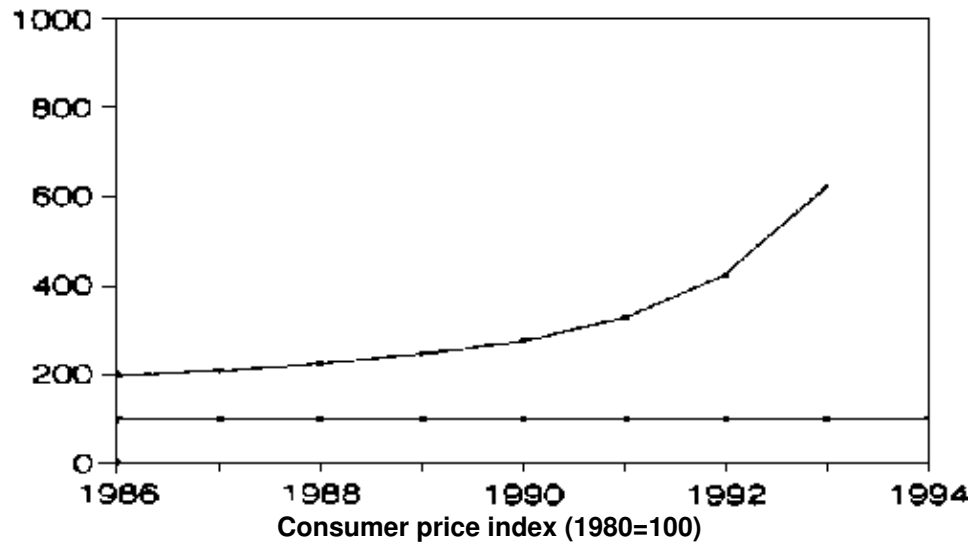
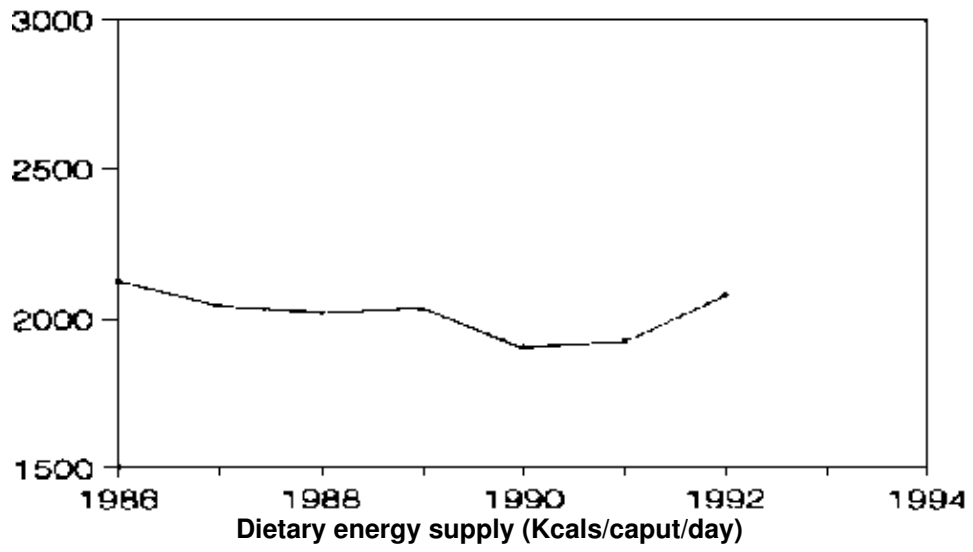
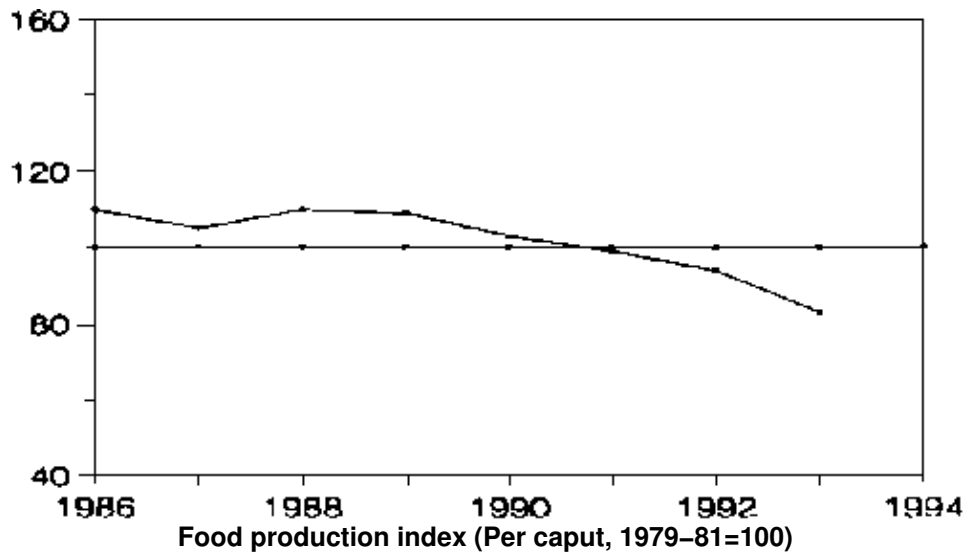


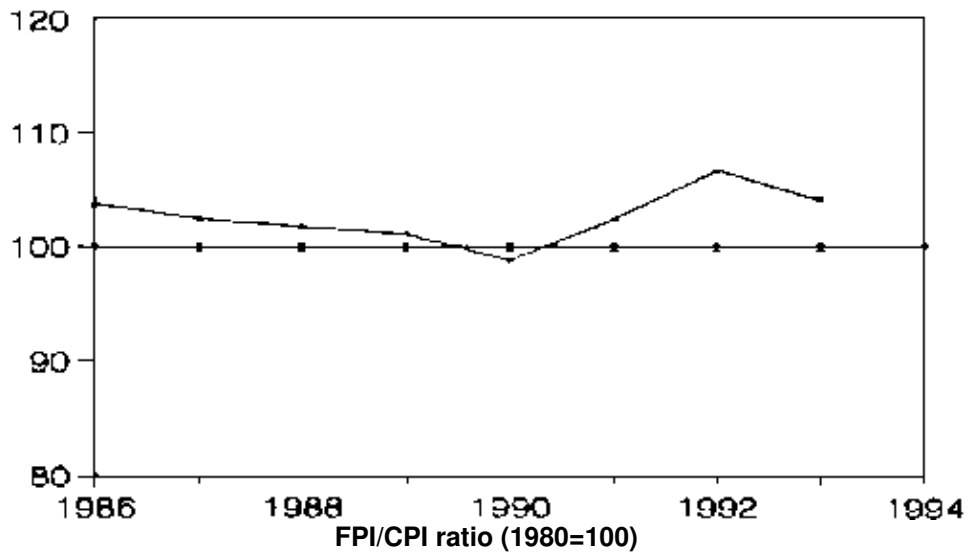
## ECONOMICS



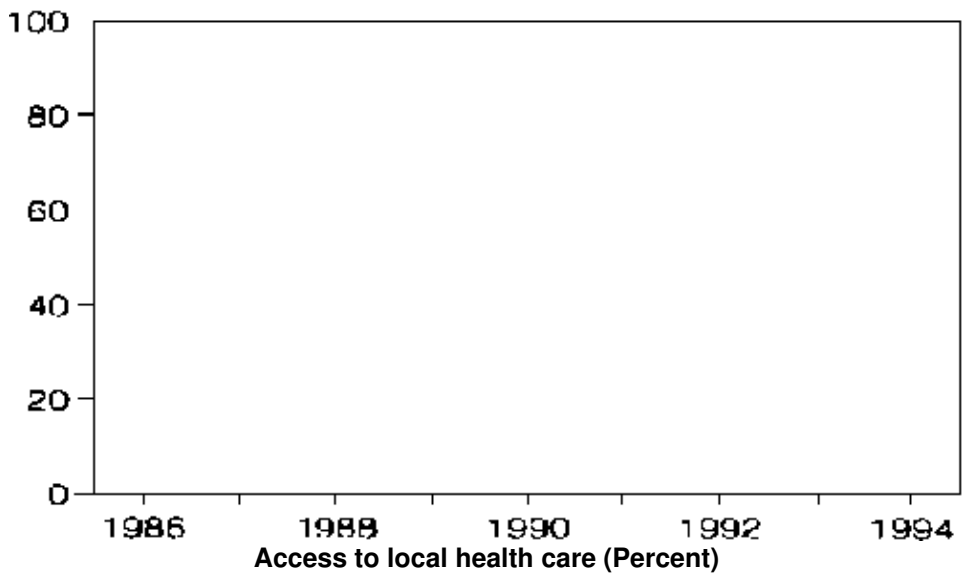
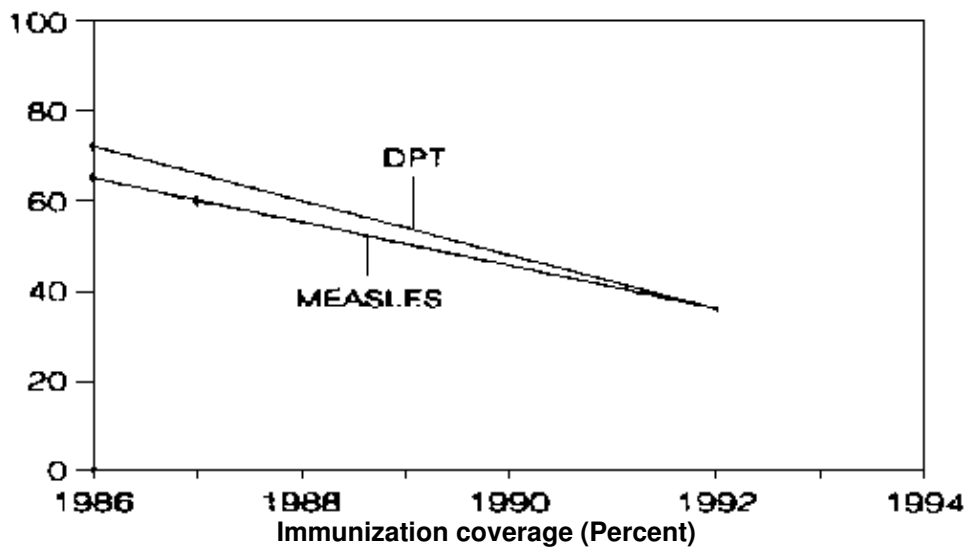
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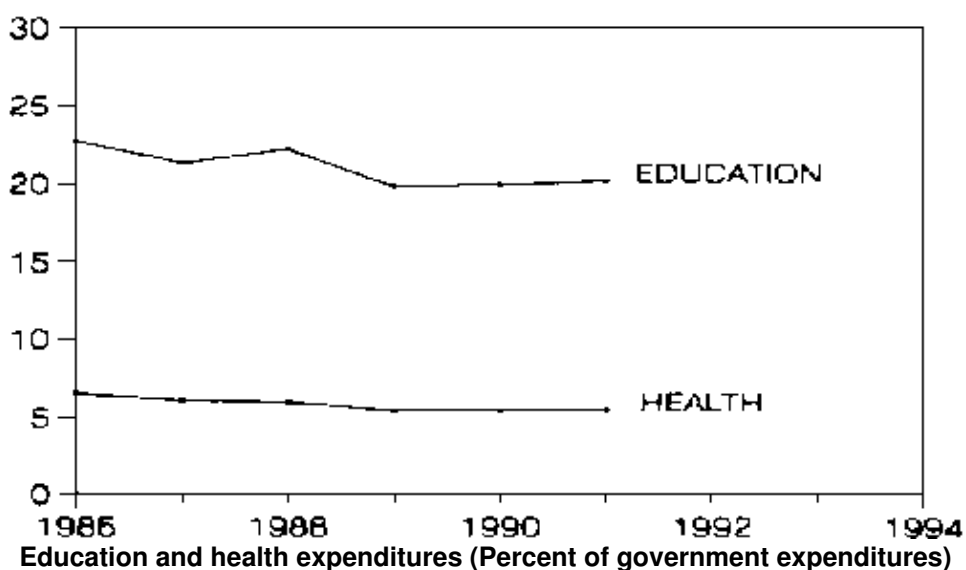
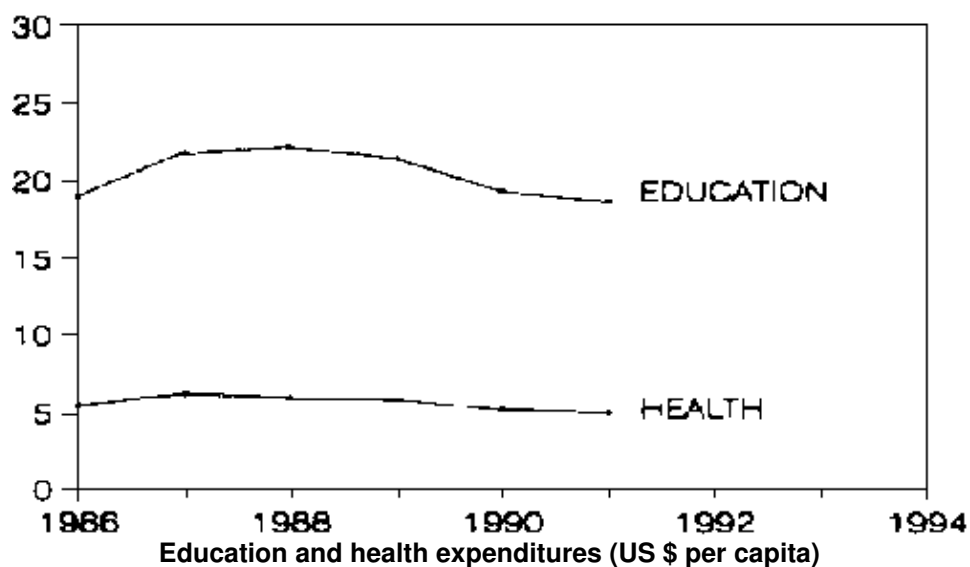




**HEALTH**



**PUBLIC EXPENDITURES**



## Madagascar

Madagascar is a nation of 13.3 million people. Population growth was estimated to be 3.1% a year during the period 1985–92. It is a low income country with per capita GNP of U.S.\$240 in 1993. Madagascar has an enormous resource endowment and a highly unequal income distribution with severe and widespread poverty. Its economy is primarily agricultural.

The nutrition situation up to 1987 was described in the ACC/SCN's Update on the Nutrition Situation, 1989, pages 69–73.

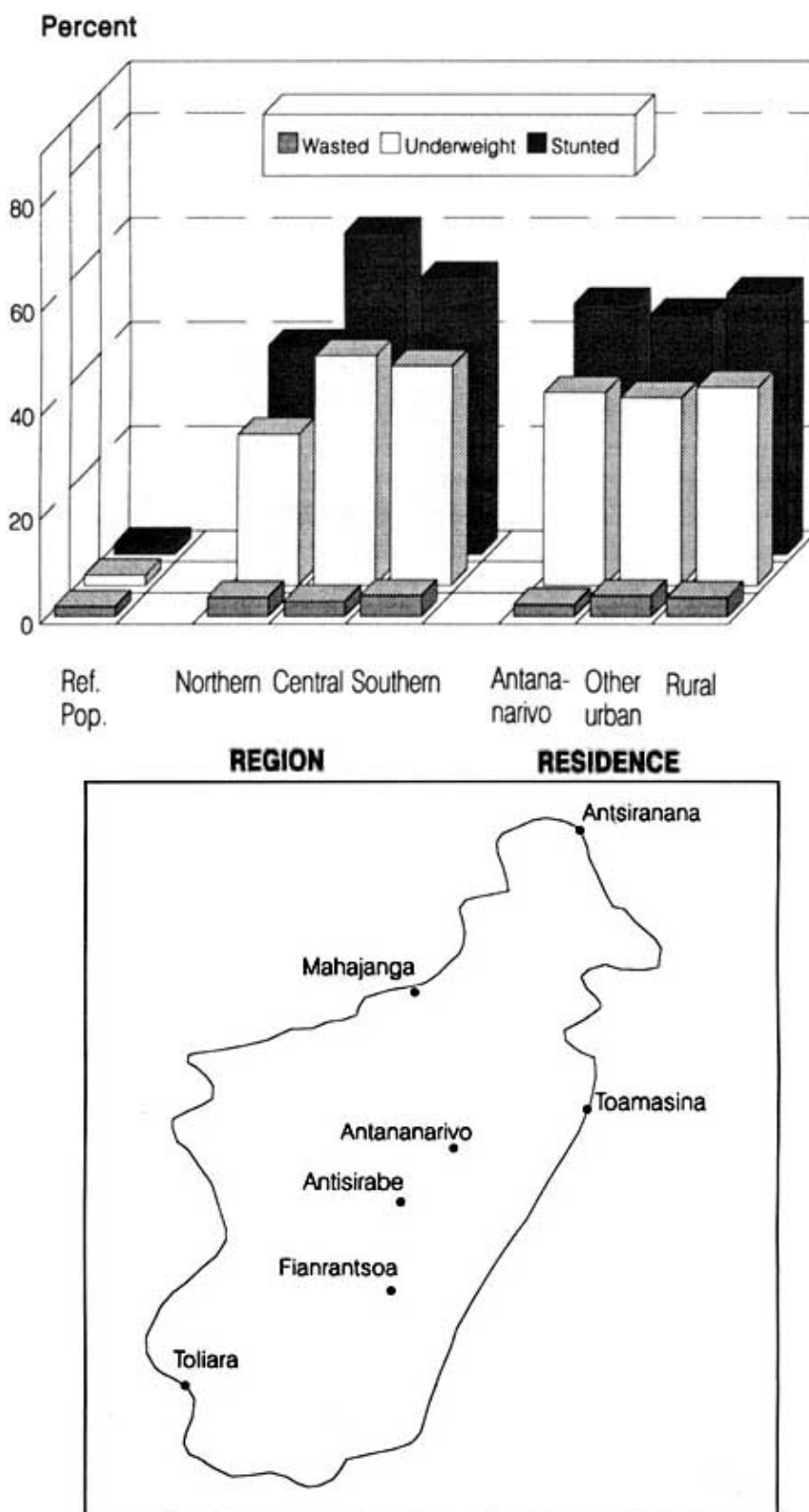
### Recent Trends in Nutrition

Two national surveys were carried out in Madagascar in the last ten years. The earlier survey, in 1983/84, covered children from 0–23 months of age, while the latter survey, carried out in 1992 by DHS and the Centre Nationale de Reserches sur l'Environnement, covered children from 0–59 months. For examining trends, data for the 0–23 months age group in the 1992 survey were used in making comparisons with the 1983/84 period.

The results indicate that over the 9 year period, the prevalence of underweight children (0–23 months <–2 s.d. weight–for–age NCHS) remained nearly the same or increased slightly (34% in 1992 vs. 32% in 1983/84), but the prevalence of stunting (<–2 s.d. height–for–age NCHS) increased markedly from 27% to 34%. Population growth rates in Madagascar over that period have been very high (3.1%), which implies that the magnitude of problems has been rising in the last ten years. The actual number of underweight children, for instance, nearly doubled – from 520,000 preschool children in 1983 to about 950,000 in 1992, due to increases in both

prevalence and population.

The 1992 data showed that there is variation in the underweight prevalence across the country. Some summary data are shown in Figure 1, by region and urban/rural. In Mahajanga/Antsiranana and Toliary provinces, the underweight prevalence (0–59 months old) was about 28%, compared to the problems in Antananarivo and Fianrantsoa provinces where the prevalence was between 44% and 47% respectively. Prevalences were somewhat higher in rural areas (40% underweight) compared to urban areas (33% underweight).



**Figure 1.** Madagascar: Undernutrition among Children under 5 years by Region and Residence, 1992

Note: Central region includes: (Antananarivo and Antsirabe provinces)  
Southern region includes: (Toliary and Fianarantsoa provinces)  
Northern region includes: (Antsiranana, Mahajanga, and Toamasina provinces)

Source: CNRE/MRAD/DHS (1994).

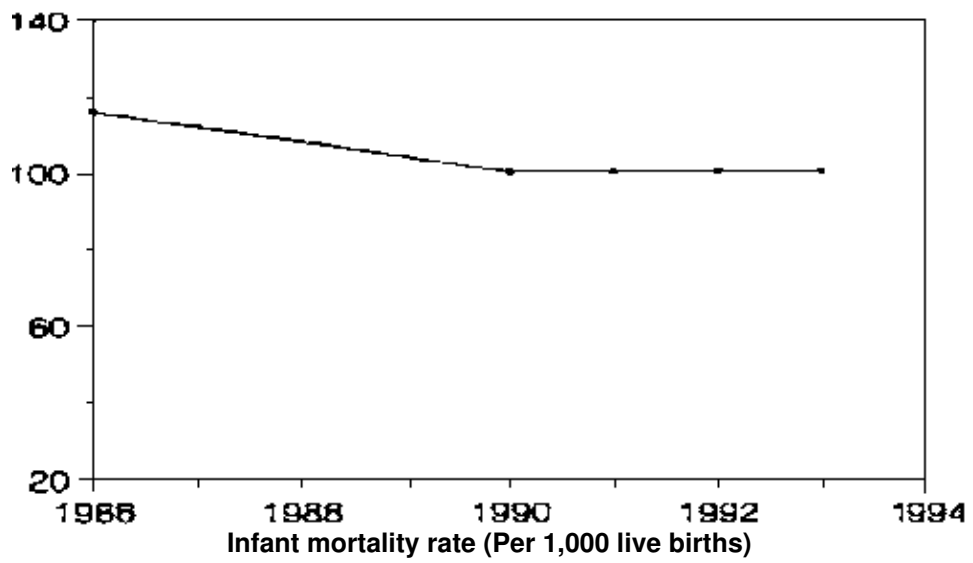
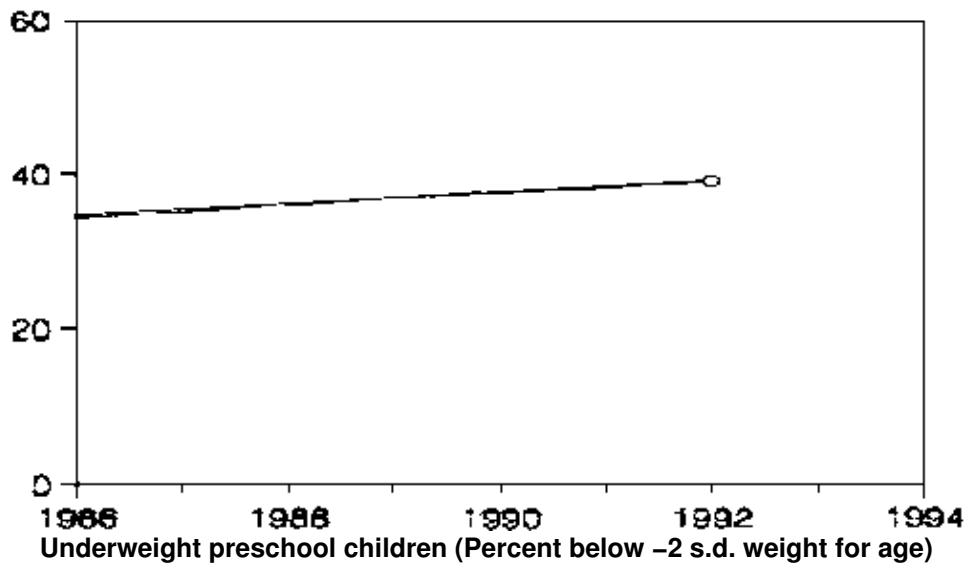


**MADAGASCAR**

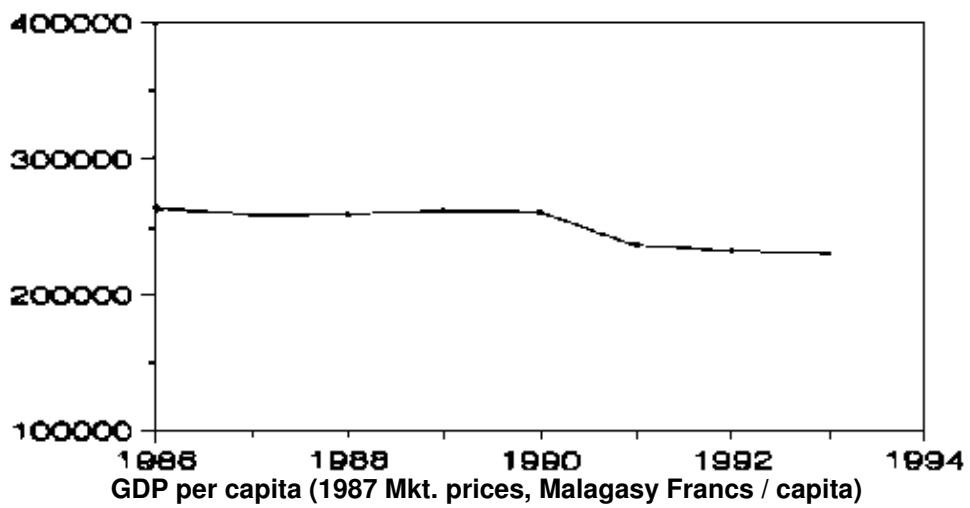
**(Estimates in 1993)**

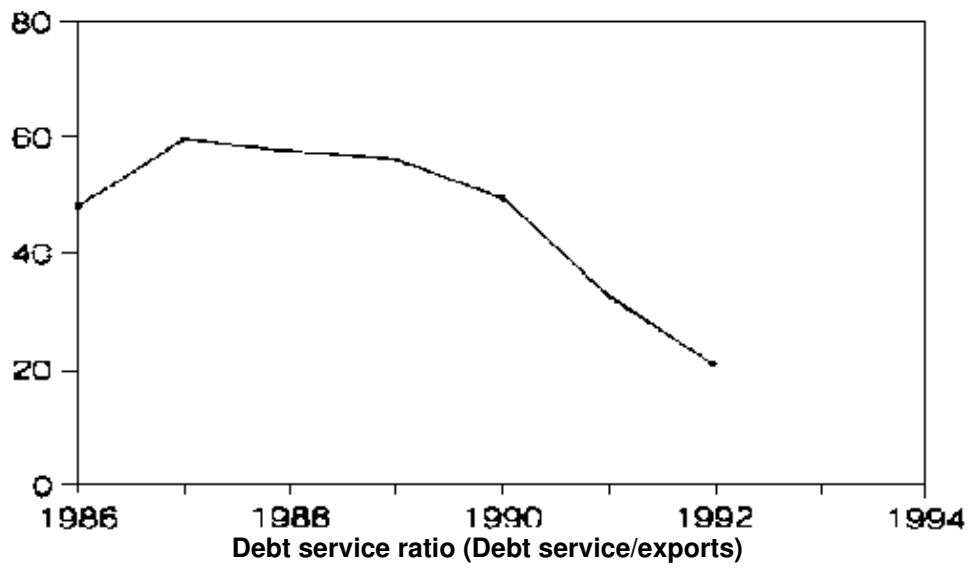
Population	: 13.3 million
Population Density	: 20 per sq. km.
Population Growth Rate	: 2.9% per annum
Urban Population	: 26%
IMR	: 100
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 240
PPP estimates of GDP (\$ Per Capita, in 1991)	: 710

**CHILD GROWTH AND SURVIVAL**

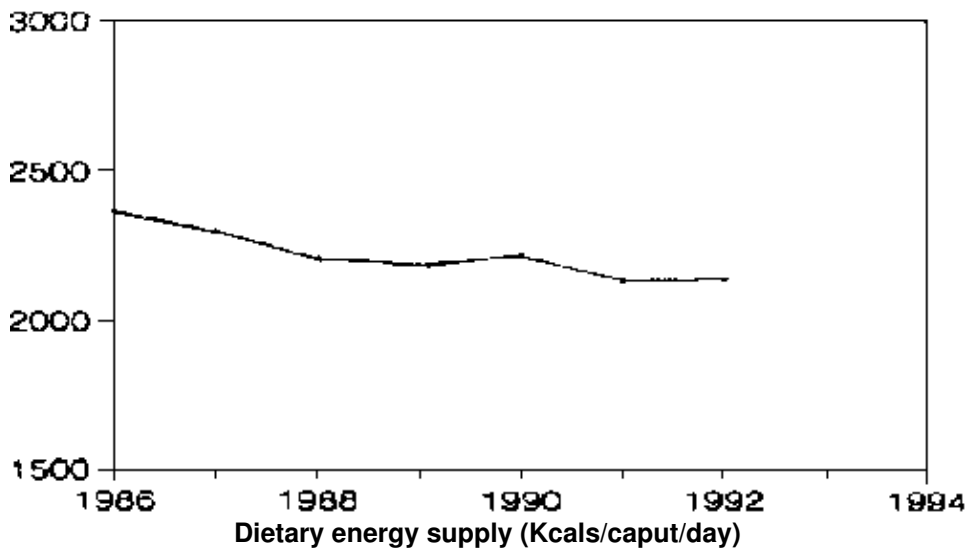
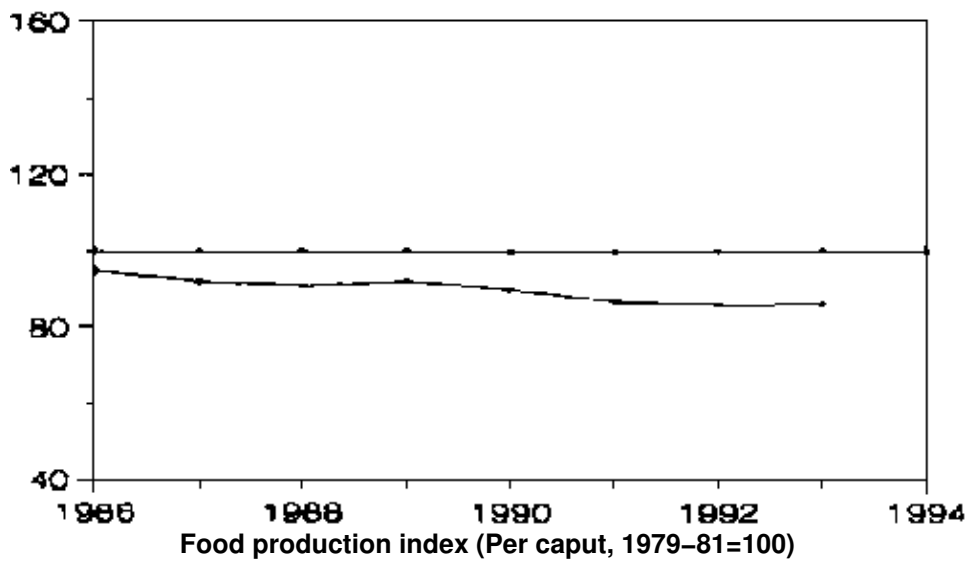


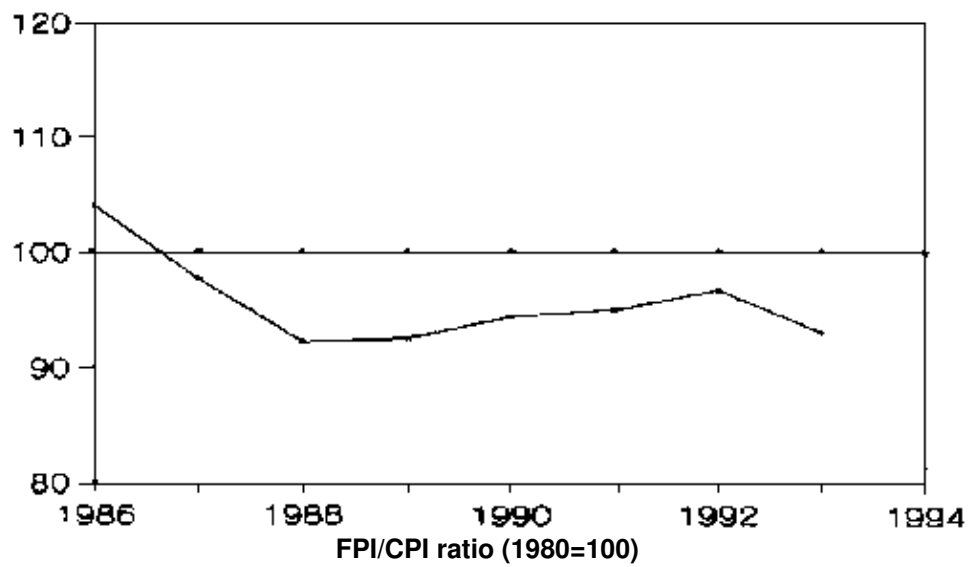
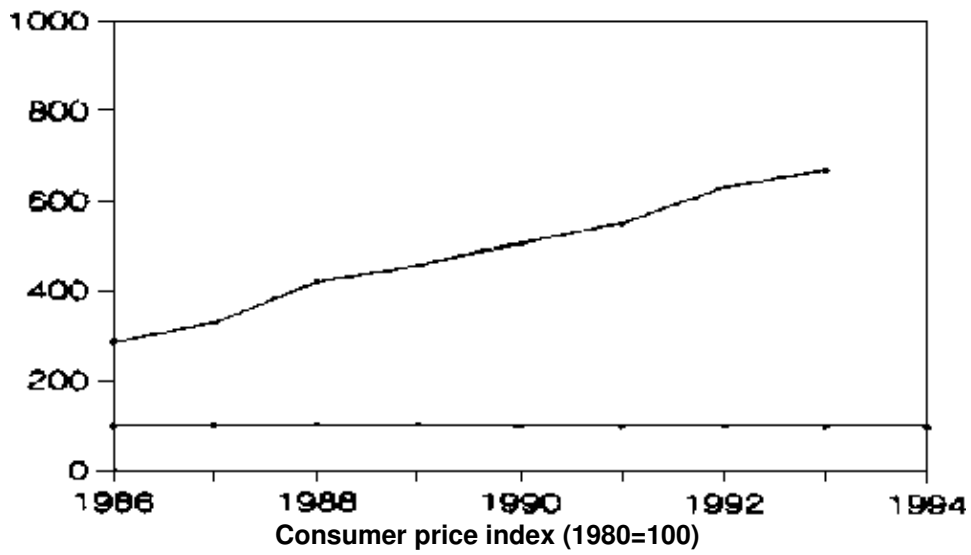
## ECONOMICS



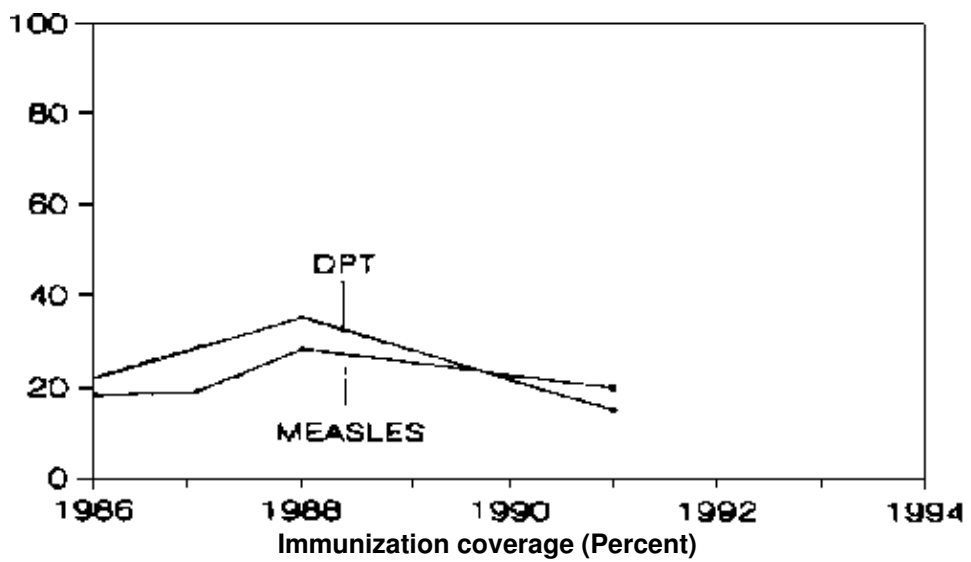


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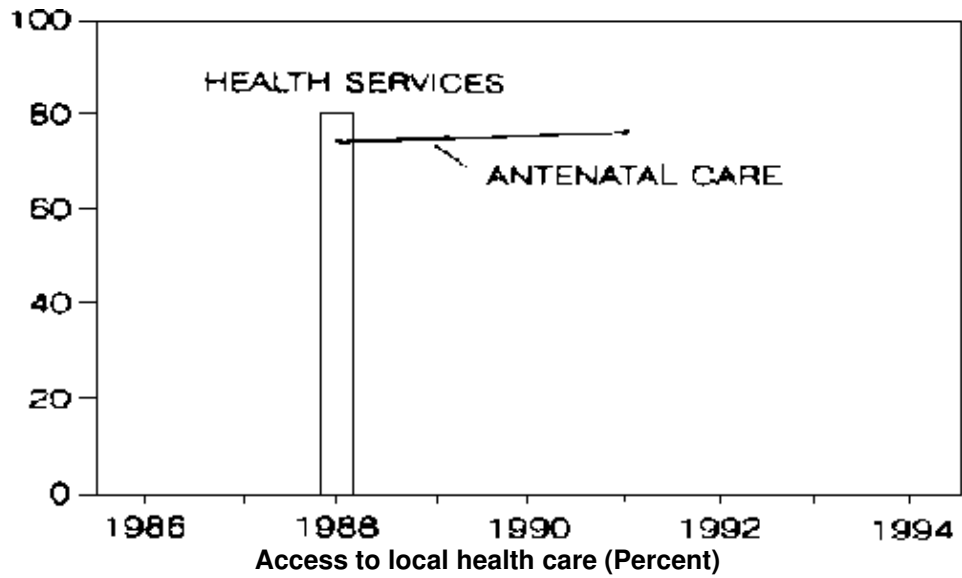




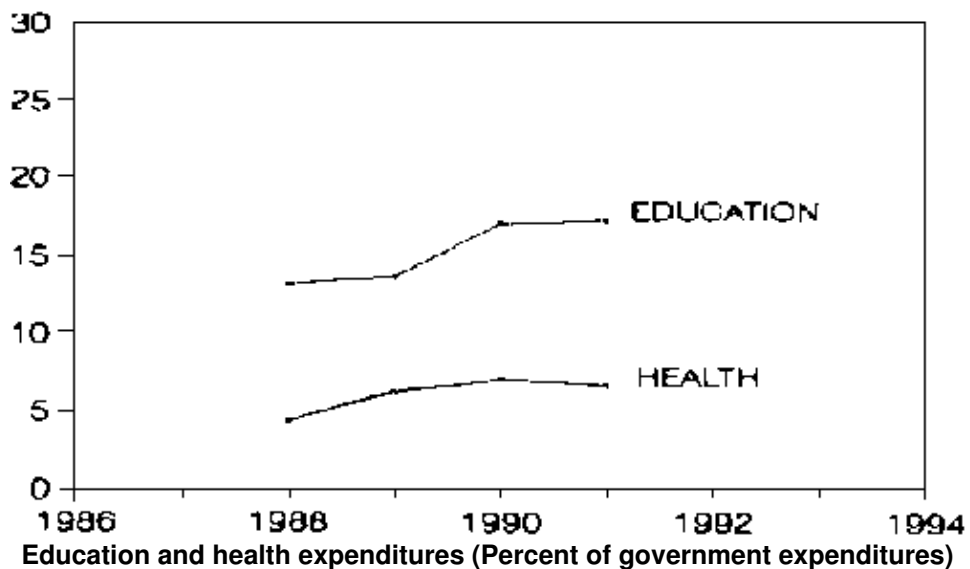
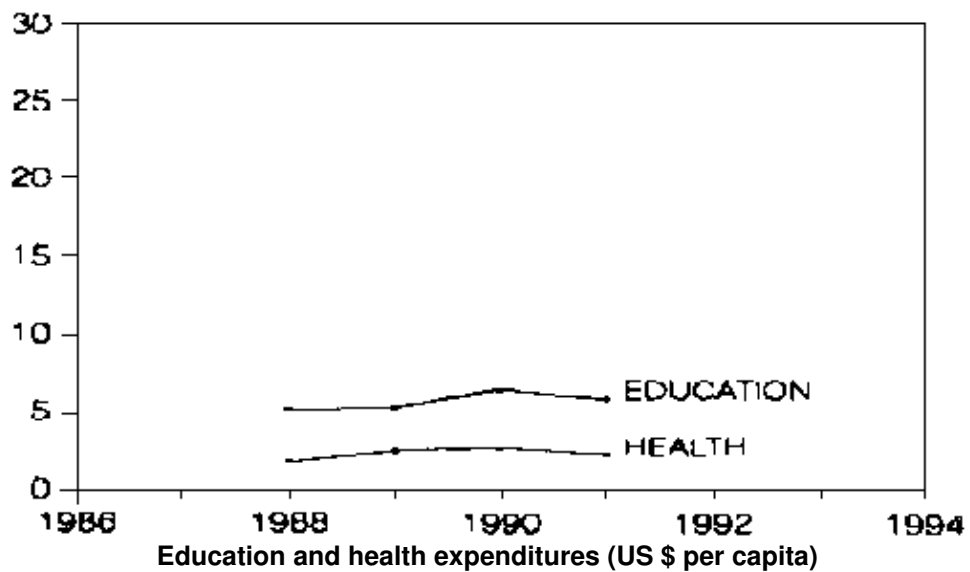
HEALTH







### PUBLIC EXPENDITURES



### Factors Affecting Trends in Nutrition

**Economic Growth.** The country faced serious economic difficulties throughout the 1980s. At the same time, population growth rates were 3.3% annually, giving rise to higher dependency ratios, which put a heavy

burden on households. The annual growth rate of real GDP per capita during the period 1986–1993 was –2.1 percent.

**Food Security.** Per capita food production has been declining particularly in the late 1980s and early 1990s. Using 1979–81 as base=100, the per capita food production index is estimated at 86 in 1993, and is about the lowest point since 1980. Partly as a result of this poor performance in the agricultural sector, the estimated per capita calorie supply per capita declined from 2370 kcals in 1985 to 2135 in 1992. Greater than 80% of the population are dependent on agriculture for both consumption and for livelihood, which is the source of more than 80% of merchandise export earnings. It is estimated that 16% of the land is usable for cropping, of which 19% is currently under cultivation.

The basic staple is rice. Government plans to restore self-sufficiency in rice (between 2.8 million and 3 million MT of paddy) by 1990 were not realized. In 1990, rice imports rose to 103,000 MT, which is higher than in the late 1980s, but is lower than the 250,000 MT of imports in 1985. Part of these import requirements were met from food aid of roughly which accounted for 30% of all import requirements.

Inflation in the 1980s was estimated at about 10%. As a result of rice buffer stocking policy, food prices were relatively stable. The food price index did not increase as much as the overall CPI, so that the FPI/CPI ratio has been below 100 for most of the late 1980s and early 1990s.

**Health, Education, Women's Status.** The total fertility rate of 6.1 births per woman is extremely high. The high rates of population growth (3.1% in early 1990s, compared to 2.7% in mid 1980s) has increased the dependency ratios and, therefore, has added pressure to the growing labor force by reducing economic opportunities.

The government has a high priority for education. Government financial statistics indicate that the proportion of educational expenditures to total government budgets rose from 13% in 1988 to about 17% in 1991, despite the increasing fiscal constraints. This translates to roughly \$6 per capita. Primary school enrollment in Madagascar is now extensive, up from 65% two decades ago. About 36% enrollment ratios were achieved in 1991 in the secondary school level, a figure that is higher than many countries in the Sub-Saharan region.

An important association of education with nutrition was found in the 1992 nutrition survey. Amongst mothers who had reached only a primary level of education, the prevalence of underweight children was about 42%, compared to 27% amongst those who had reached secondary education.

In terms of health services, about 80% of the population had access to public health services in 1988, and about 75% of mothers were reported to have access to antenatal care. Immunization coverage of 12–23 months old children was estimated in 1992 by the DHS survey as 43%, 58% in urban and 41% in rural areas. Malarial infection had again reached epidemic proportions in recent years, even in the central highland areas where malaria had previously been eliminated.

Infant mortality rates in Madagascar are higher than the Sub-Saharan Africa average, at 100 per 1000 live births. Some improvements were, however, observed in the last decade or so.

## **Malawi**

Malawi is a nation of about 9.3 million people. In addition, up to 1.3 million refugees from Mozambique have been temporarily settled in the country. The population growth rate during the period 1985–92 was estimated to be 3.4% per annum. Population growth is a critical problem here, as most of the suitable land is now under cultivation. Malawi is one of the most densely populated countries in Africa with more than 170 persons per square kilometer of arable land.

### **Recent Trends in Nutrition**

The prevalence of underweight children in Malawi was estimated in 1992 as 27% (<–2 s.d. weight-for-age NCHS) of 0–59 month old children based on a national nutrition survey carried out by the Malawi National Statistical Office in 1992 in collaboration with the Demographic and Health Surveys. A comparable national survey in 1981 gave the extent of underweight in children as 24%. Thus the prevalence is estimated to have increased by about 0.3 percentage points per year through the 1980s.

The malnutrition figures for 1992 were affected by drought, which occurred in the 1991/92 crop year. The survey was carried out late in 1992, and the harvest 4–6 months earlier was the worst in many years. Thus the estimated increase in prevalence includes effects of the drought.

An increase in acute malnutrition (measured by wasting – <–2 s.d. weight–for–height NCHS) was likewise observed comparing the two periods and this showed an increase from 1.6% to 5.4%. Stunting in 1992 was estimated at 48% – a high figure for Sub–Saharan Africa. The estimated number of underweight children has risen from 290,000 in 1981, to a level of 590,000 in 1993. This doubling of the size of the malnutrition problem is the product of the prevalence and the high population growth rates in the country.

The 1992 nutrition survey indicates that the Central and Southern regions are worse off than the North. The rural areas had considerably higher rates of underweight prevalence compared to the urban areas –nearly double in some cases. The prevalence of underweight appears to peak with the 12–23 month age group, and during the pre–harvest period. This was observed in all the 24 districts of the country.

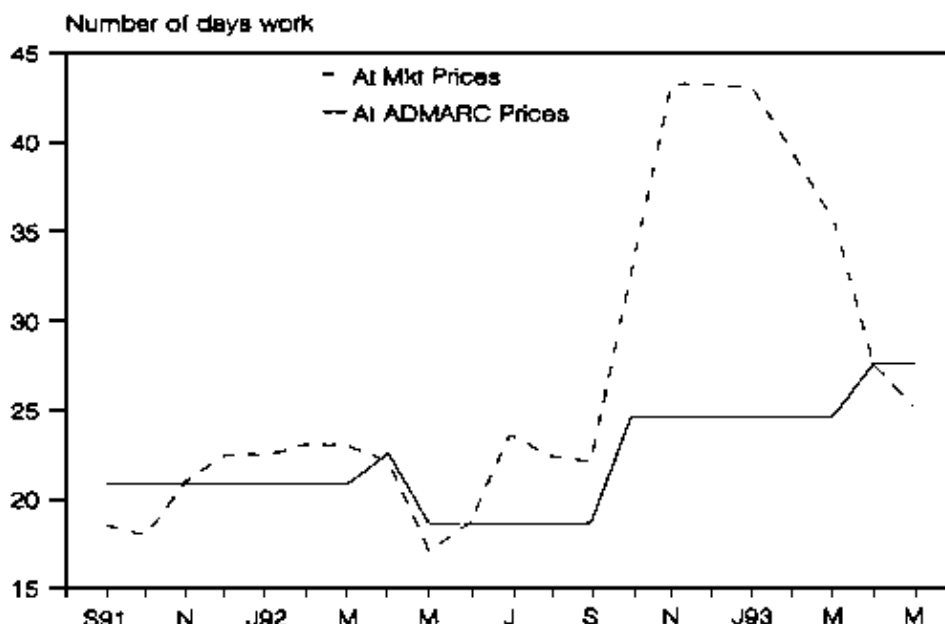
The infant mortality rate (IMR) in Malawi is extremely high, estimated at 141 per 1000 live births in 1993 – more than double that estimated in Kenya for instance. The IMR figures have not been improving in the last decade or so.

### **Factors Affecting Trends in Nutrition**

**Economic Growth.** In 1993 the per capita GNP was estimated at U.S.\$220. GDP per capita remained virtually unchanged between 1986 and 1993, except for a significant drop in 1992 due to a drought. Strong growth came to a halt in the early 1980s with the onset of a series of economic problems and external shocks including weather–related problems. The year 1992 was perhaps the worst year in terms of economic development in the country for many years. Macroeconomic difficulties were compounded by the most severe drought in the last several decades. In 1993 the rate of inflation was estimated at 23.5%, reflecting, in part, the impact of two substantial devaluations of the kwacha (local currency).

**Food Security.** The drought of 1992 caused marked increases in the price of maize. A 90 kg. bag of maize cost more than an equivalent of a month's wage in many regions (see Figure 1). In fact, the number of days' work required to purchase a 90 kg. bag rose from about 25 days in September 1992 to about 43 days by January 1993, falling again by mid–1993. The food price index in Malawi in that period rose considerably faster than the general CPI. Further deterioration of nutrition is thus likely to have occurred in 1993 (after the 1992 survey).

Data based on food balance sheets indicate that the per capita kcal intake fell during the 1980s, to around 2000 kcals in 1990, and further during the 1991/92 drought. The drought of the 1991/92 crop season brought production of maize to its lowest level in the last decade (see Food Production Index). Food crop production, however, experienced a turnaround in the 1992/93 crop season with national surpluses in maize, rice, and millet, allowing the government to replenish its Strategic Grain Reserve.



**Figure 1.** Malawi: Number of Days' Work Required to Purchase 90kg. bag of Maize. September 1991–May 1993.

Source: Malawi Department of Planning and Development (1993).

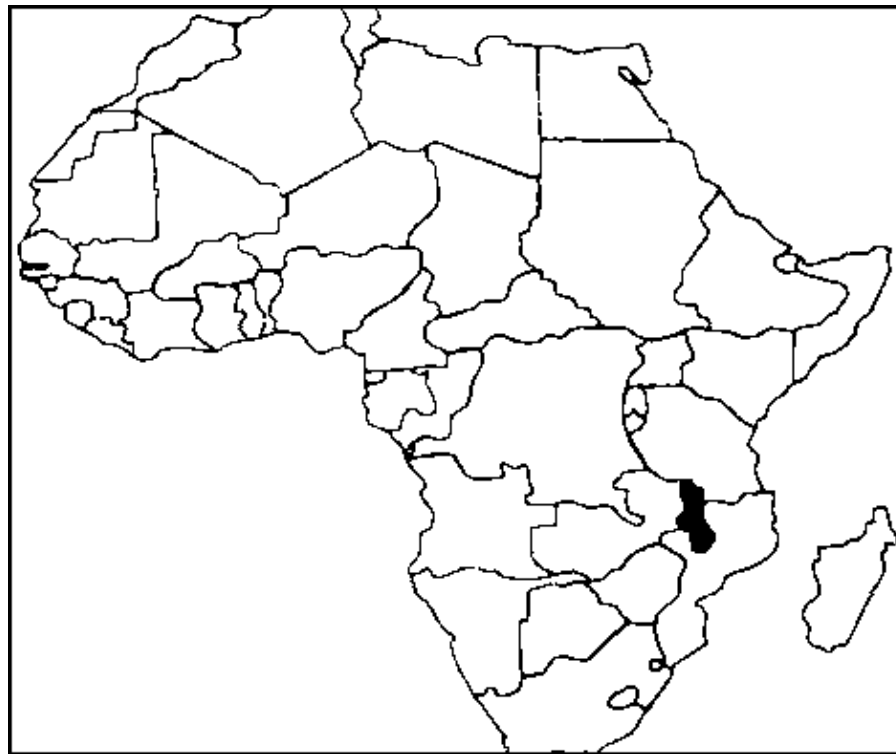
Malawi has widespread poverty and food insecurity problems. More than half of the population lives below poverty line, including about 60% of small holders and estate workers. The country is still recovering from 60% crop losses during the 1992 drought. Refugees stress food supplies, and the division between estate productivity and smallholder agriculture continues to worsen skewed income distribution in the rural sector.

Agriculture in normal years contributes one-third of GDP and over 90% of export earnings. It employs almost half of those in paid employment, and supports at least 85% of the population. The main subsistence crop is maize, grown by most smallholders, and other crops are sorghum, millet, pulses, root crops, and fruit, whilst fish is also important in the subsistence diet. The food production index has been showing an erratic trend since 1986. It declined to 70 in 1993 (base, 1979–81=100). The food supply situation in 1993/4 was generally favorable due to a record harvest in 1993.

The government monitors the nutrition and food security situation through its food security and nutrition unit in the Department of Economic Planning and Development, under the office of the President.

**Health, Education.** Although the government has been committed to a policy of primary health care, the quality of services had been very low due to inadequate funding. In 1990, fiscal data indicate that the government spent about \$4 per capita on health, roughly 7% of the total budgetary expenditures for that year. Estimates in 1991 indicate that about 80% of the population had access to primary health care, and maternal and child health services had been more widely available compared to the 1980s. More recently the country has been beset by problems of malaria and AIDS, which put increasing strains on health services. Recent estimates show that 11% of the total health budget has been directed towards problems related to AIDS. Malawi now has one of the highest rates of AIDS cases in Southern Africa, with 22,300 cases reported in June 1993.

Literacy in Malawi has been reported at 41% in 1991. School enrollment rates are about 43% in the primary level, but only 7% at the secondary level. Trends in education expenditure show a stagnant picture. The latest data from 1989 show that the government spent less than \$5 per capita for education, a figure considerably lower than its neighbors in Southern Africa.

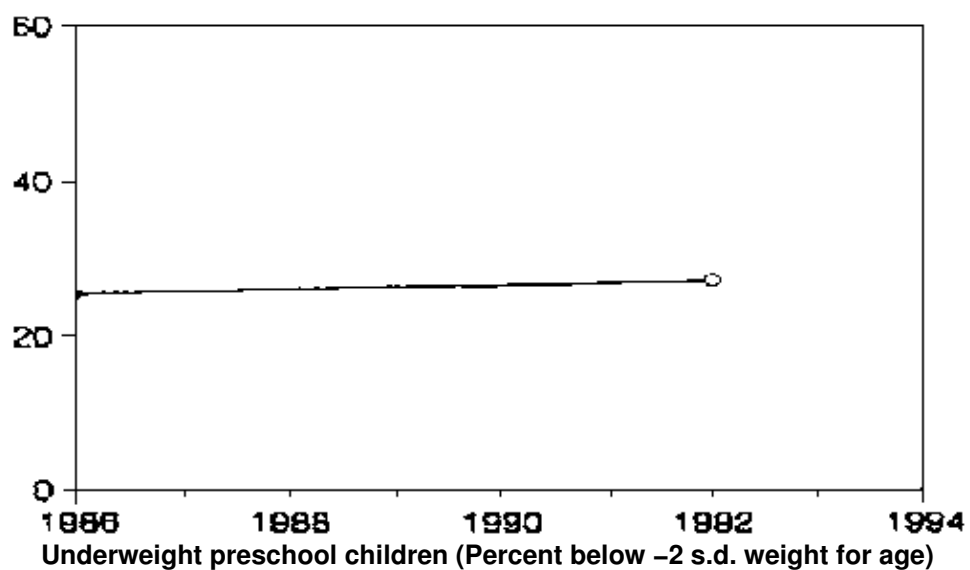


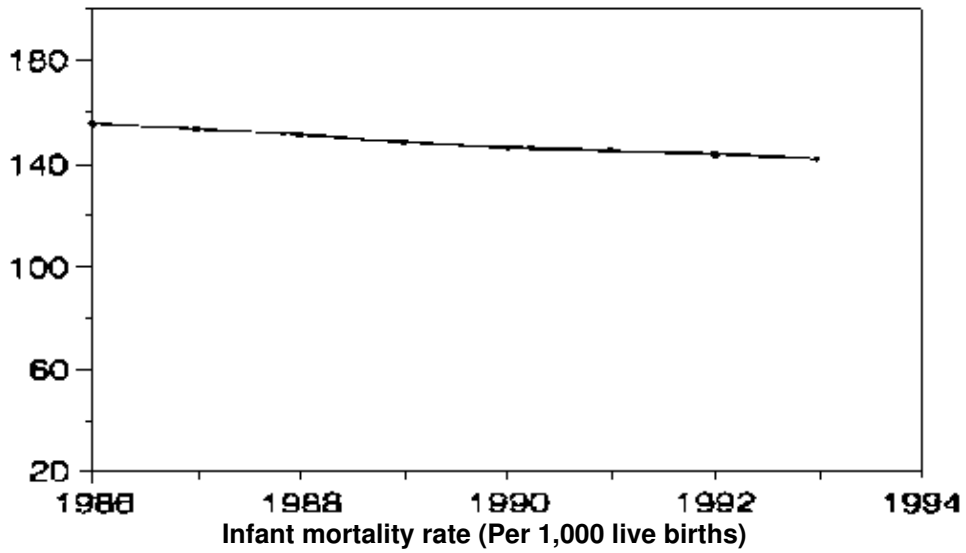
**MALAWI**

**(Estimates in 1993)**

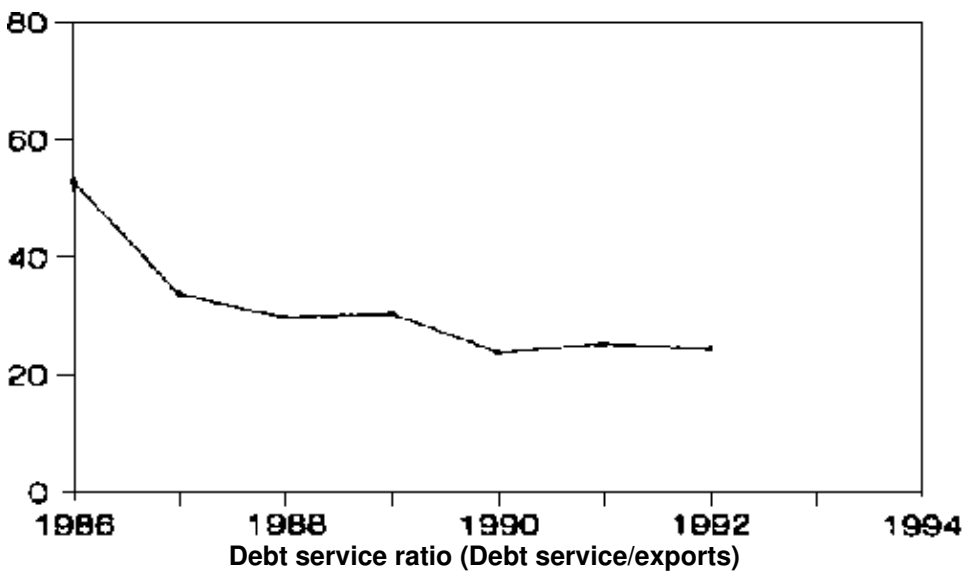
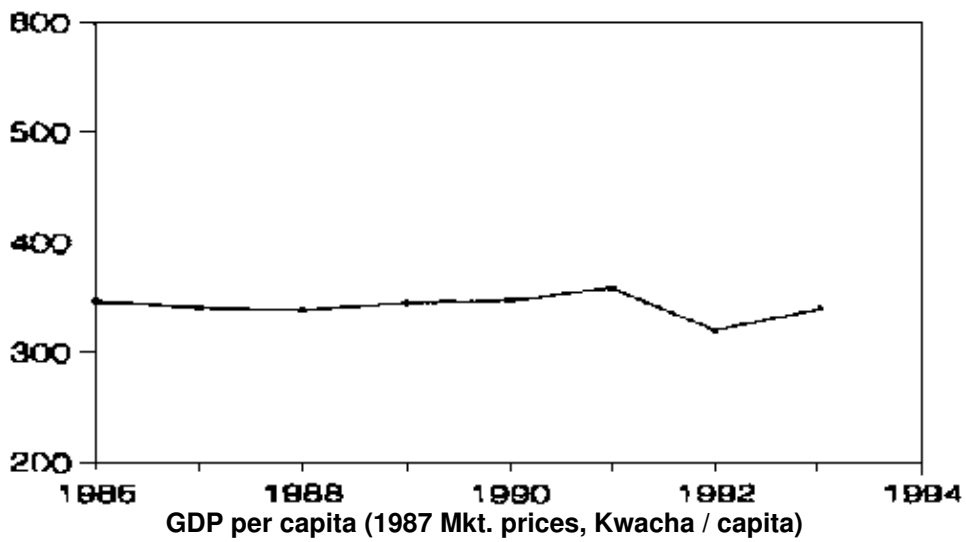
Population	: 9.3 million
Population Density	: 74 per sq. km.
Population Growth Rate	: 2.9% per annum
Urban Population	: 12%
IMR	: 141
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 220
PPP estimates of GDP (\$ Per Capita, in 1991)	: 800

**CHILD GROWTH AND SURVIVAL**

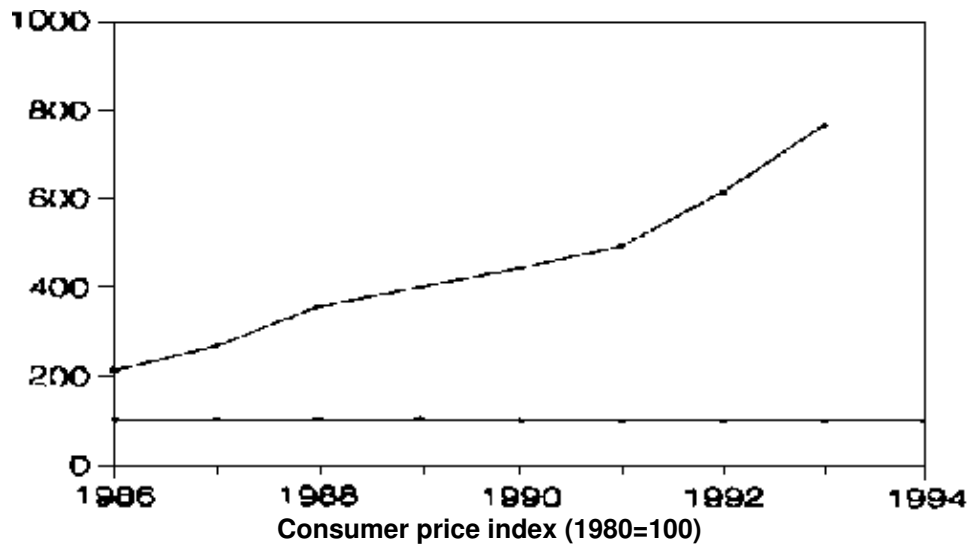
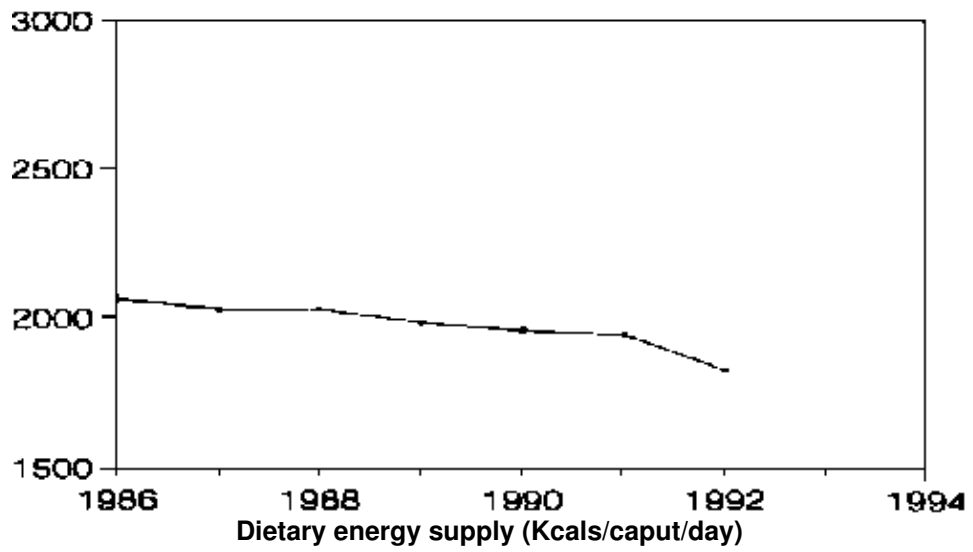
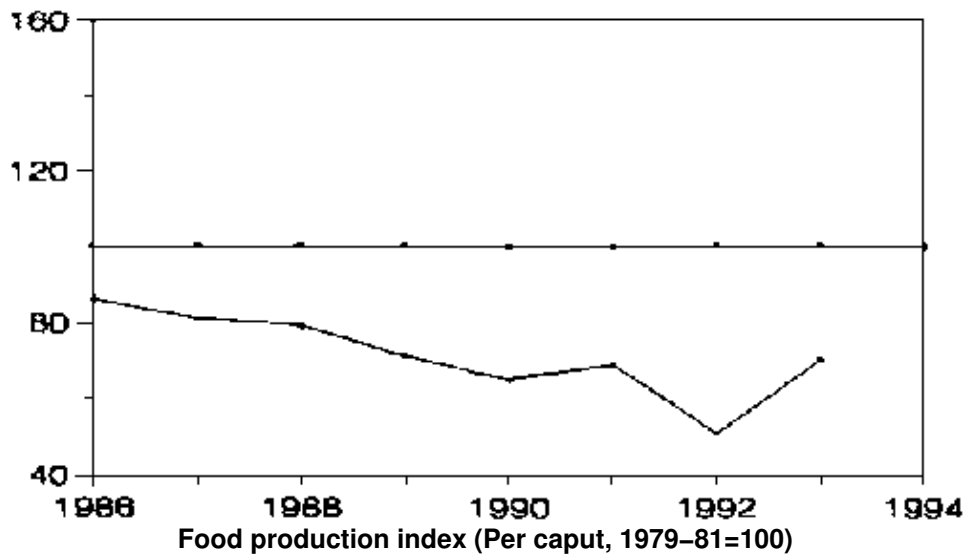


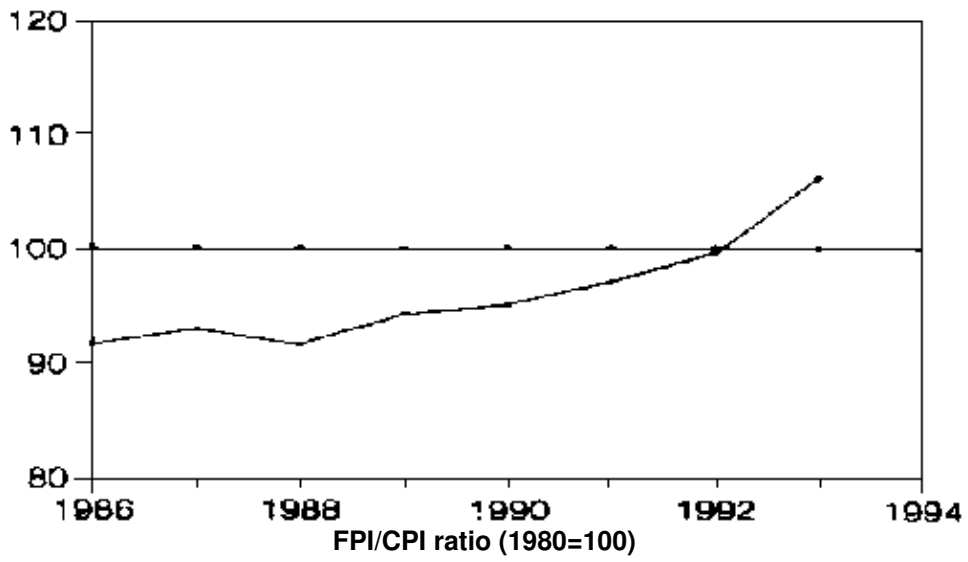


**ECONOMICS**

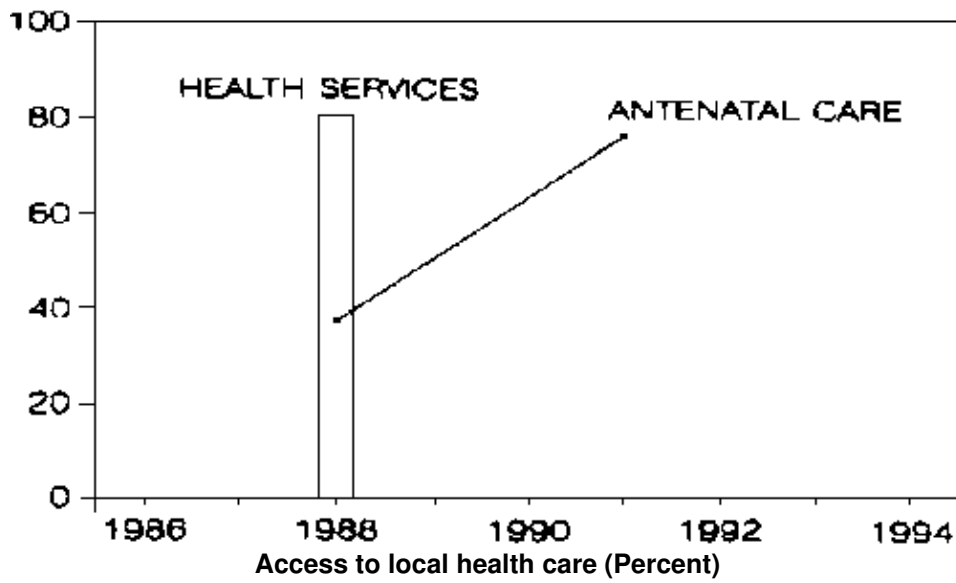
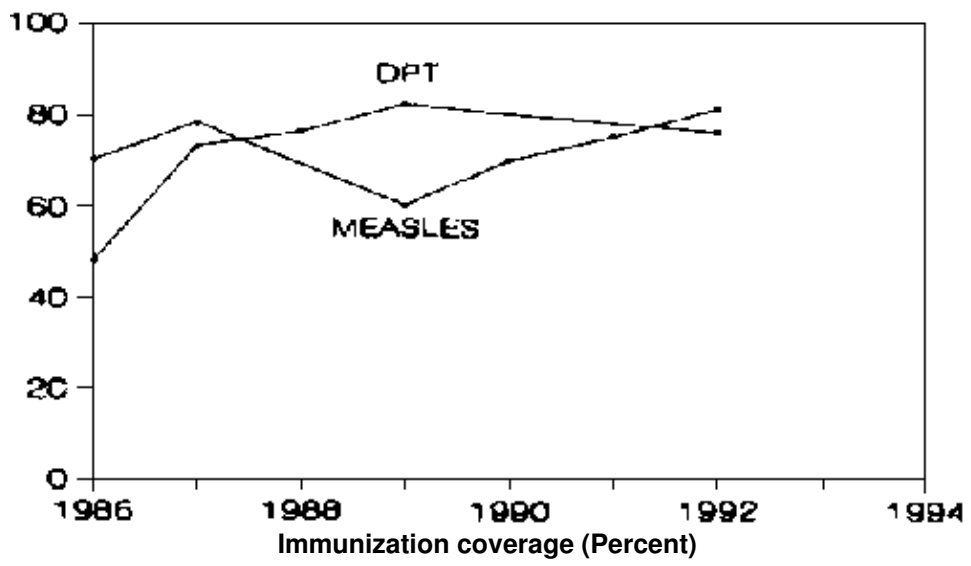


**FOOD**



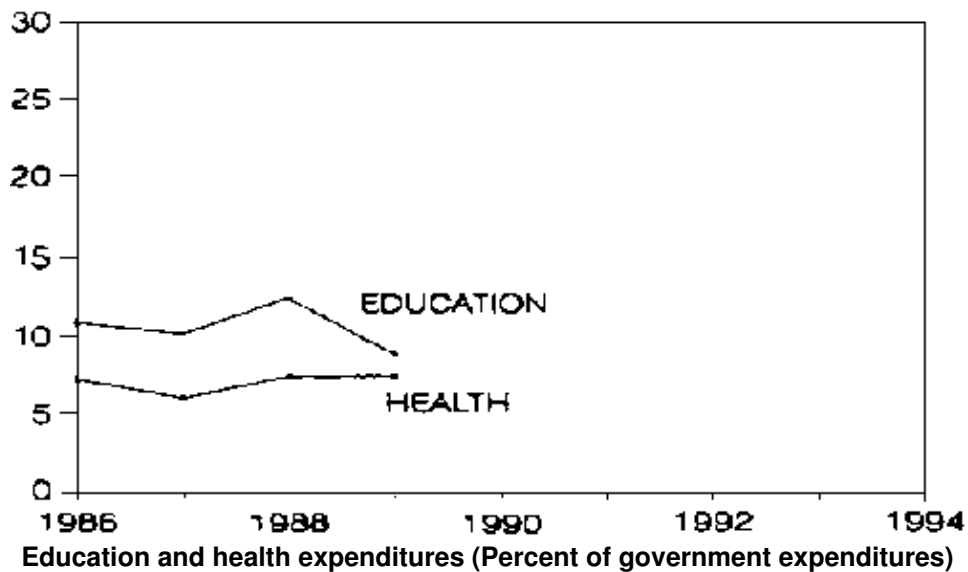
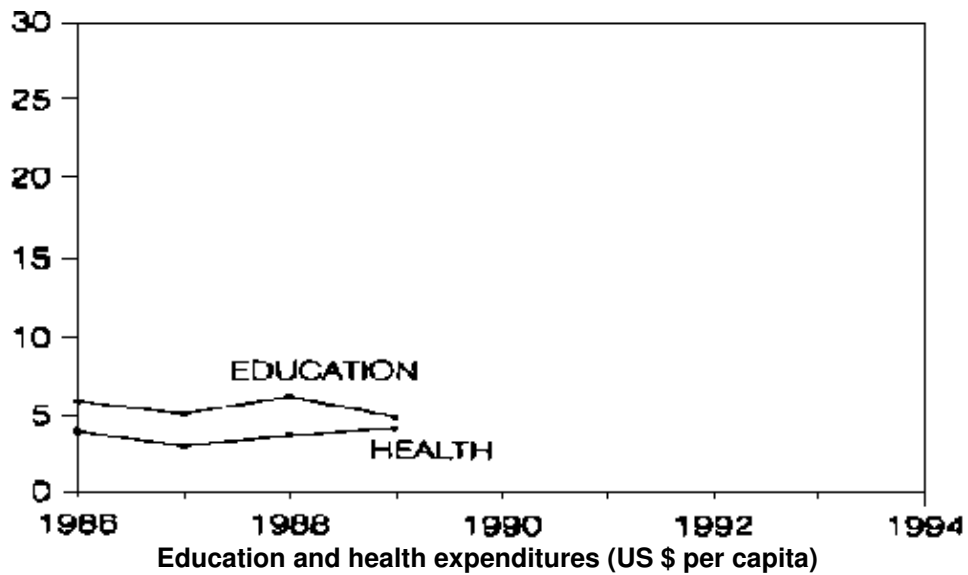


HEALTH



PUBLIC EXPENDITURES





## Morocco

The population of Morocco, which was estimated to be 25 million in 1991, grew at a 2.5% annual rate between 1985 and 1992, to 27.1 million in 1993. An estimated 45% of the population was urban by 1991 (12.3 million) and the average urban growth rate was about 5% per year. Unemployment continues to be a serious social problem, estimated at more than 20% in urban areas in a 1991 survey. Morocco has abundant natural resources with vast areas of arable land, extensive coastlines well suited for tourism, and maritime resources like fisheries.

### Recent Trends in Nutrition

Comparisons between two national nutrition surveys carried out in 1987 and 1992 (both assisted by DHS), show estimated improvements in the prevalence of underweight children (<-2 s.d. weight-for-age NCHS) from 12% (1987) to 9% (1992). (The 1987 survey sampled 3–36 months old children, whereas the 1992 survey covered 0–59 months old children; the 1987 data has been adjusted to the 0–59 months old equivalents, calculated as 11.8%).

Improvements were largely accounted for by declines in stunting (from 29% to 23%), with wasting (low weight for height) remaining fairly constant between the two periods. The prevalence of underweight was twice as high in rural areas compared to urban areas.

The fall in prevalence of underweight children between 1987 and 1992 was enough to somewhat reduce the total numbers of underweight children, from about 560,000 to less than 500,000. Infant mortality rates have

been continuing their downward trend as well, now estimated at 61 per 1000 live births in 1993, compared to 73 per 1000 in 1987.

### Factors Affecting Trends in Nutrition

**Economic Growth.** Morocco's per capita GNP in 1993 was U.S.\$1,030 and the average annual growth rate of per capita GDP was 0.5% for the period 1986–93.

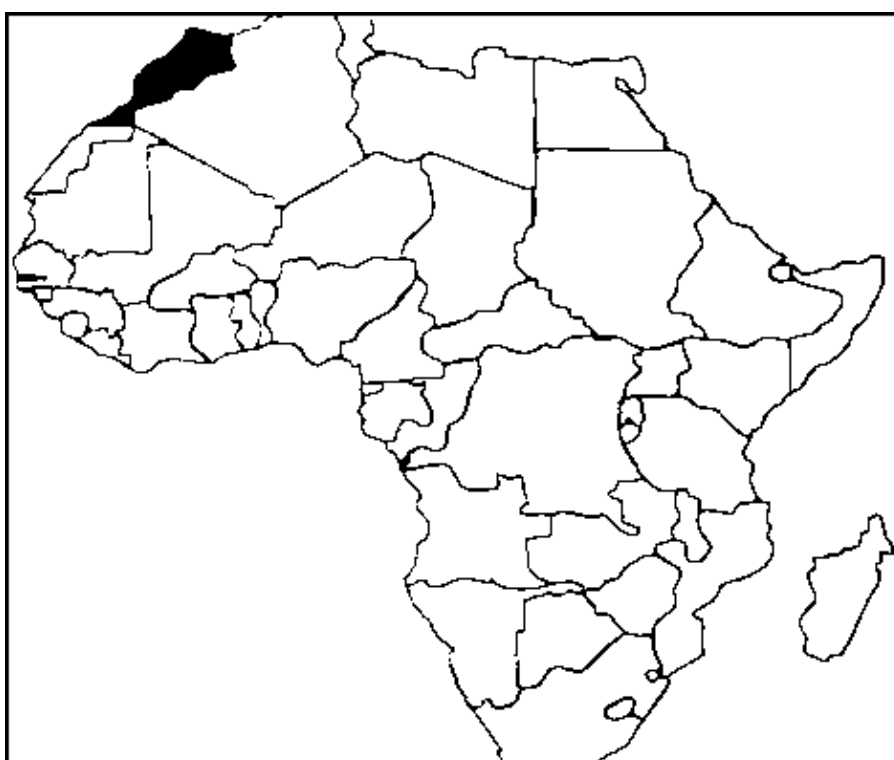
In recent years Morocco's GDP has shown sharply fluctuating growth trends. In part, this has been due to erratic primary sector activity. Although agriculture contributes only between 15% and 20% of GDP, it provides a livelihood for a large proportion of the economically active population, so variations in output due to changes in weather have a multiplier effect on overall economic activity.

GDP growth in real terms showed a significant improvement in the second half of the 1980s. GDP expanded strongly in 1991 under the impact of a record agriculture performance, but a two-year drought caused the economy to contract in 1992 and then again in 1993.

A government policy objective is elimination of any budget deficit. Achievement of this, however, has been delayed by the drought, which has forced public expenditure to rise (drought relief, agricultural debt rescheduling, public works etc.) and economic activity and revenue to decline. The central government's budget deficit was reduced to 1.7% of GDP in 1992, which was less than the 3.1% recorded in 1991. Inflation has been low, hovering around 5% during 1991–93.

**Food Security.** Absolute poverty has declined from over 20% in 1985 to around 13% in 1991, but rates of improvement of basic social indicators are less satisfactory. This is partly due to the high population growth rate. About 40% of the work force is engaged in agriculture, which accounts for over a quarter of exports. Per capita food production index, with base year (1979–81=100), has decreased from 130 in 1986 to 106 in 1993, mainly due to two-year drought in the country in 1992/3. Cereal production also decreased from 8.7 million MT in 1986 to 2.9 million MT in 1991 and also in 1993. Indications are that the 1993/4 harvest was back to pre-drought levels of 8.5 million MT.

Due to this drastic decline in cereal production, Morocco had to import 3.9 million MT of cereal in 1992/93 and 2 million MT in 1991/92. In 1992 imports of food products rose to 12.1% of total imports by value, the highest proportion since 1986. Wheat imports rose by 57.6%, to 2.42 million MT, due to the poor domestic harvest. In the 1991/92 and 1992/3 crop years 4.9 million hectares were planted to cereals, with barley accounting for 2.2 million hectares, hard and soft wheat for 1.1 million hectares each, and maize for 0.5 million hectares.

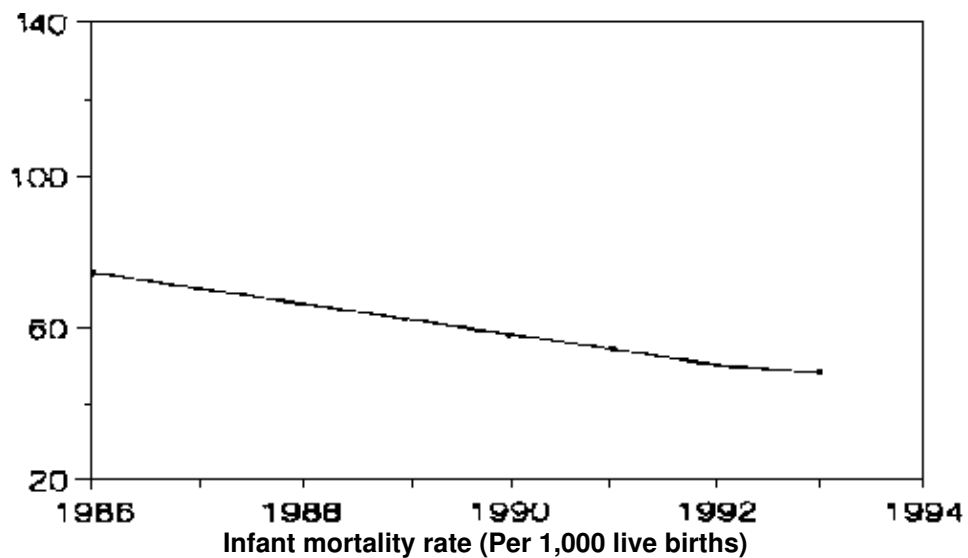
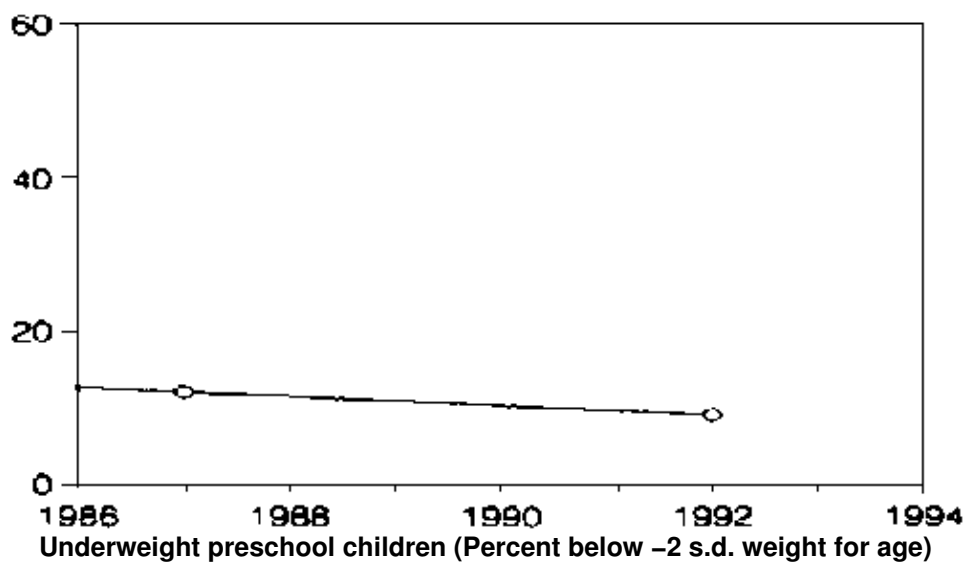


MOROCCO

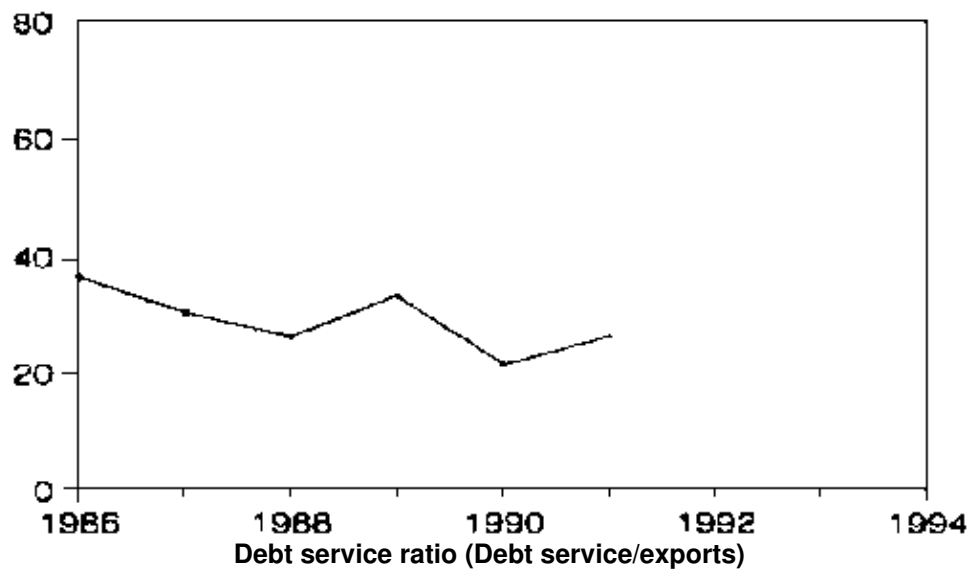
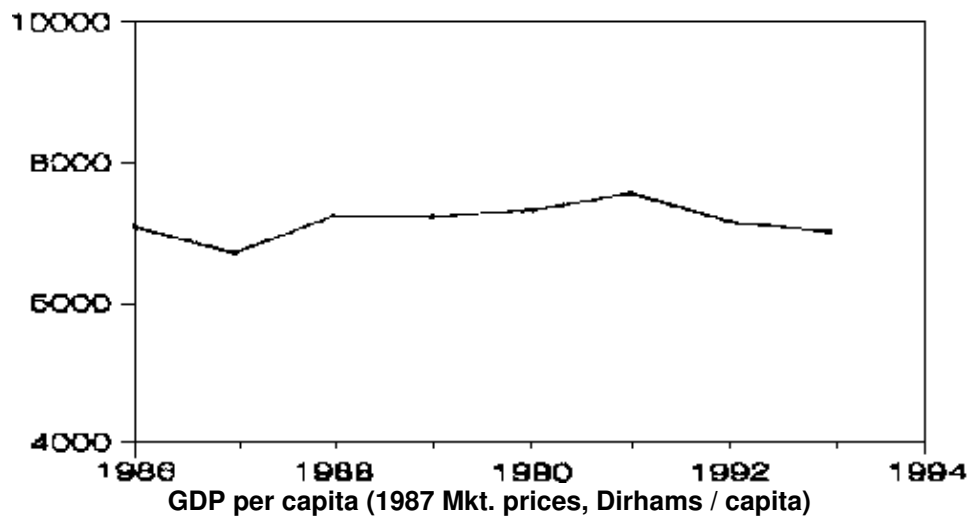
**(Estimates in 1993)**

Population : 27.1 million  
Population Density : 57 per sq. km.  
Population Growth Rate : 2.1% per annum  
Urban Population : 48%  
IMR : 48  
GNP US\$ (Per Capita) : 1030  
(WB Atlas Methodology)  
PPP estimates of GDP : 3340  
(\$ Per Capita, in 1991)

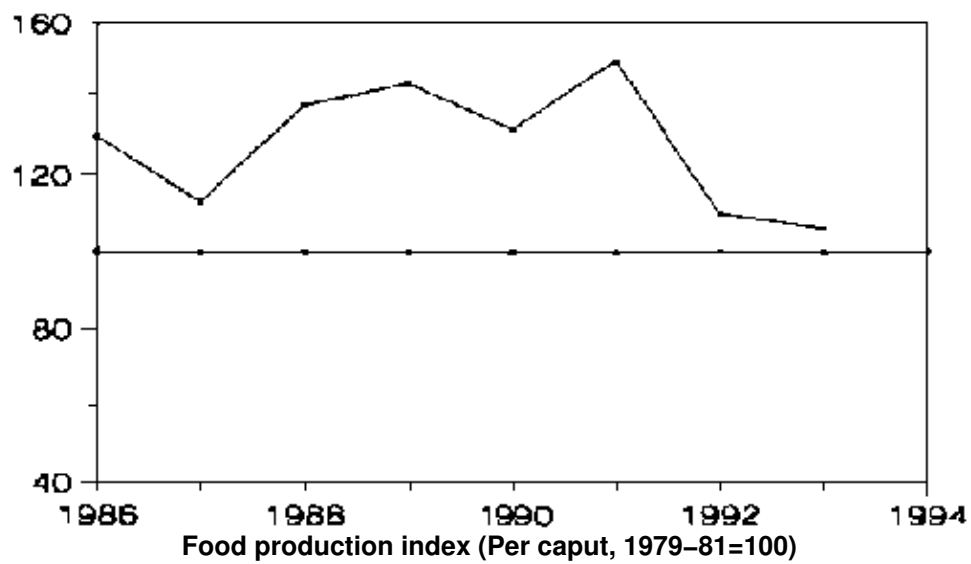
**CHILD GROWTH AND SURVIVAL**

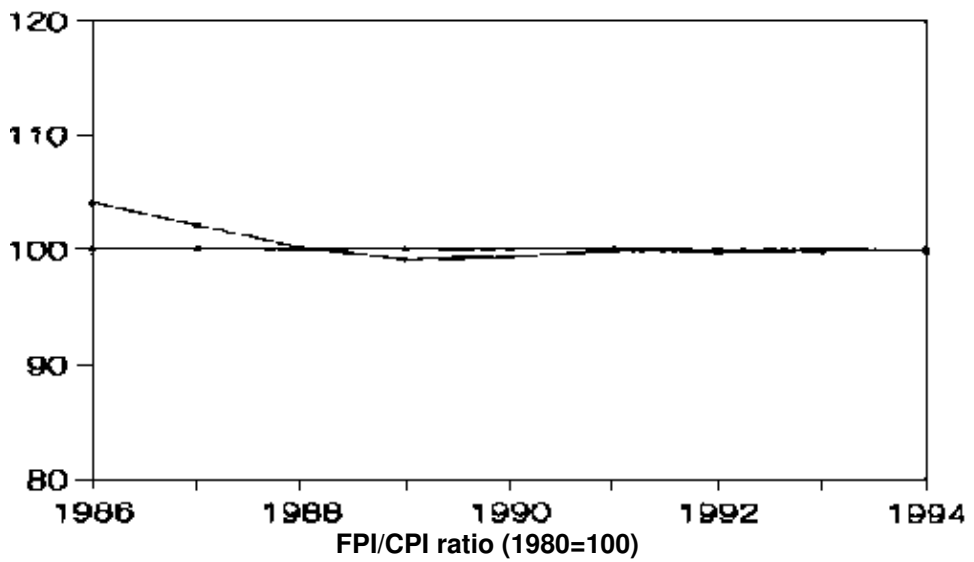
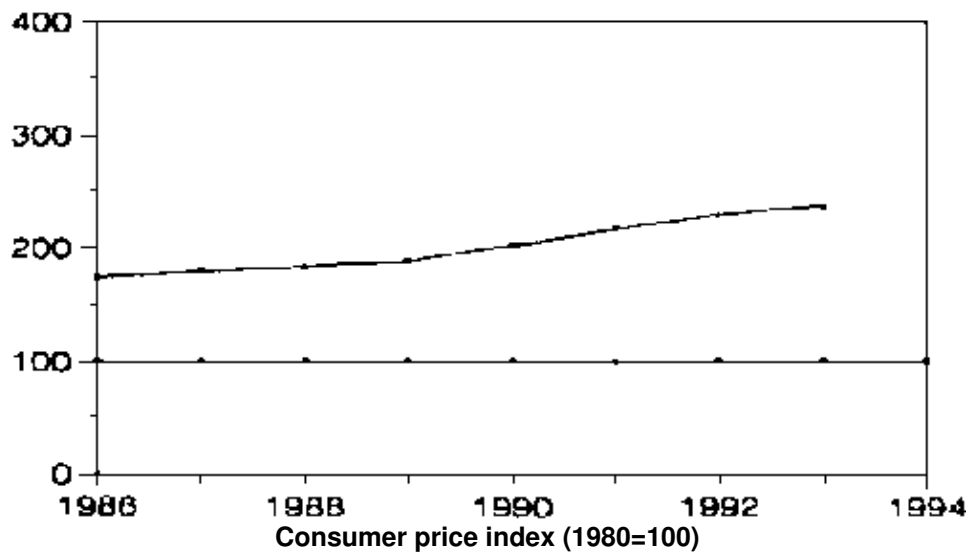
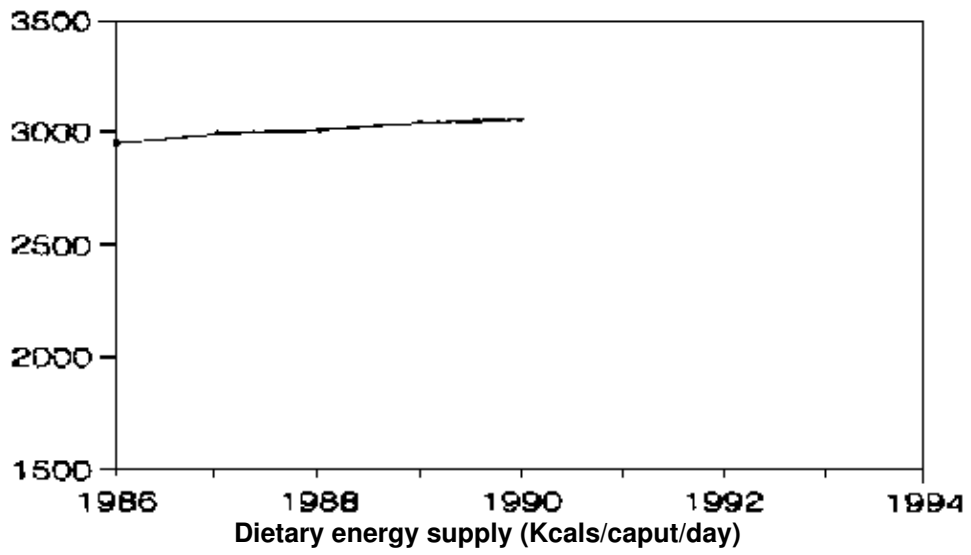


**ECONOMICS**

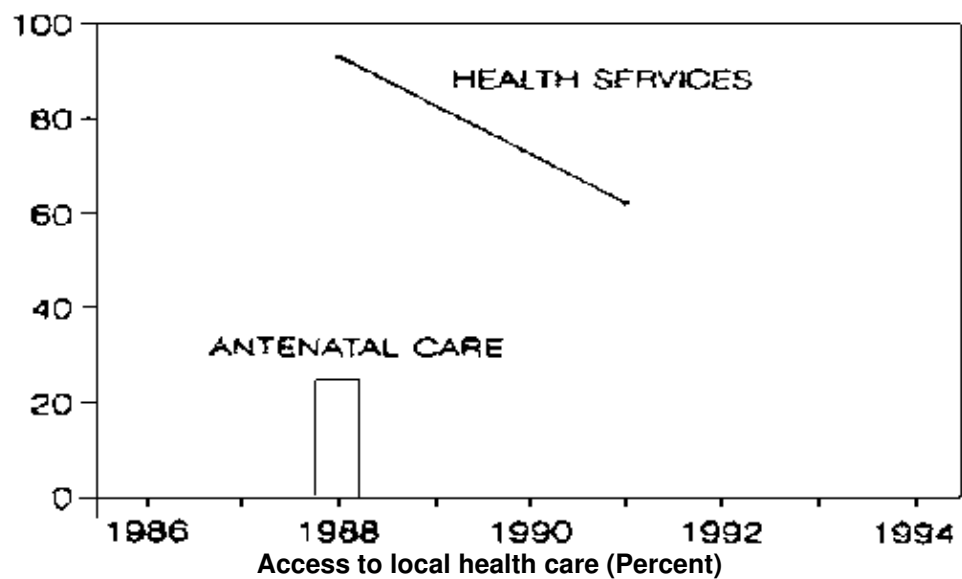
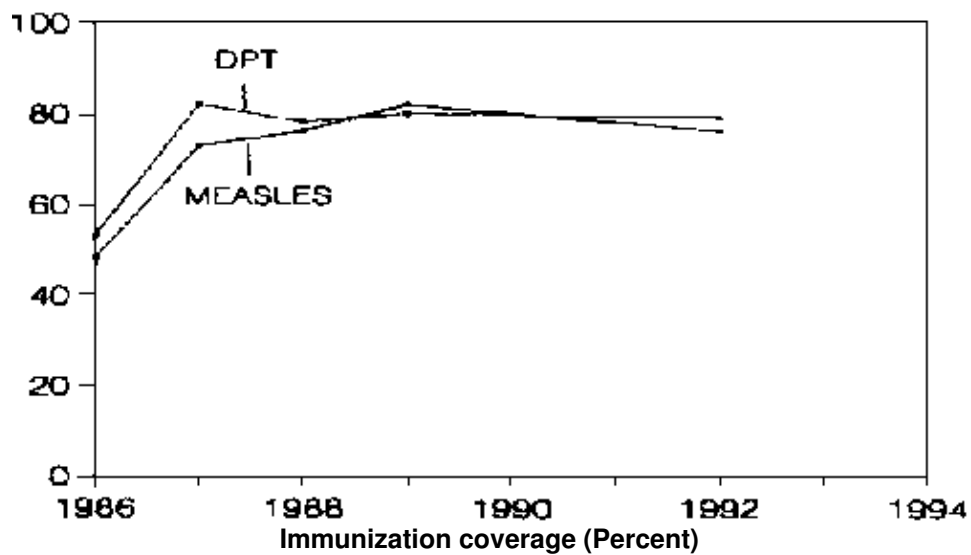


FOOD

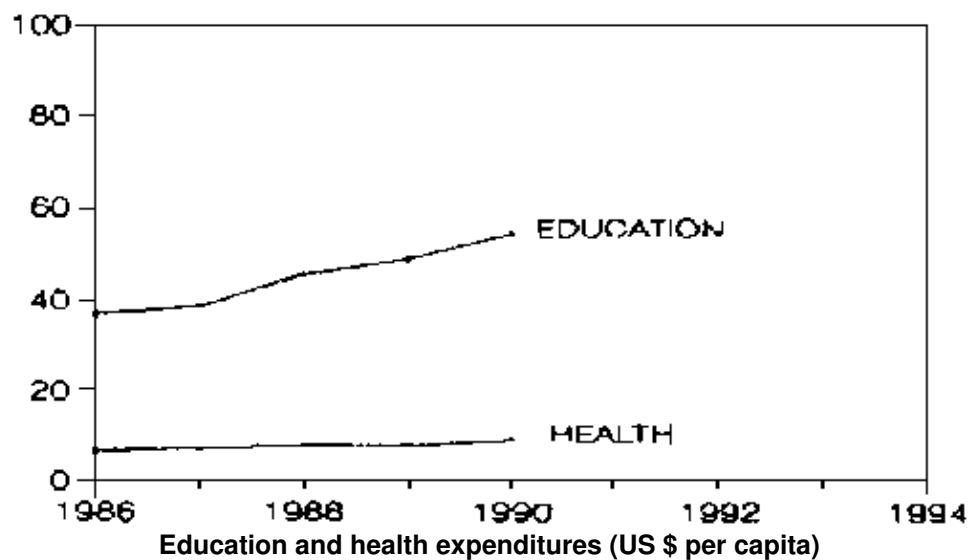


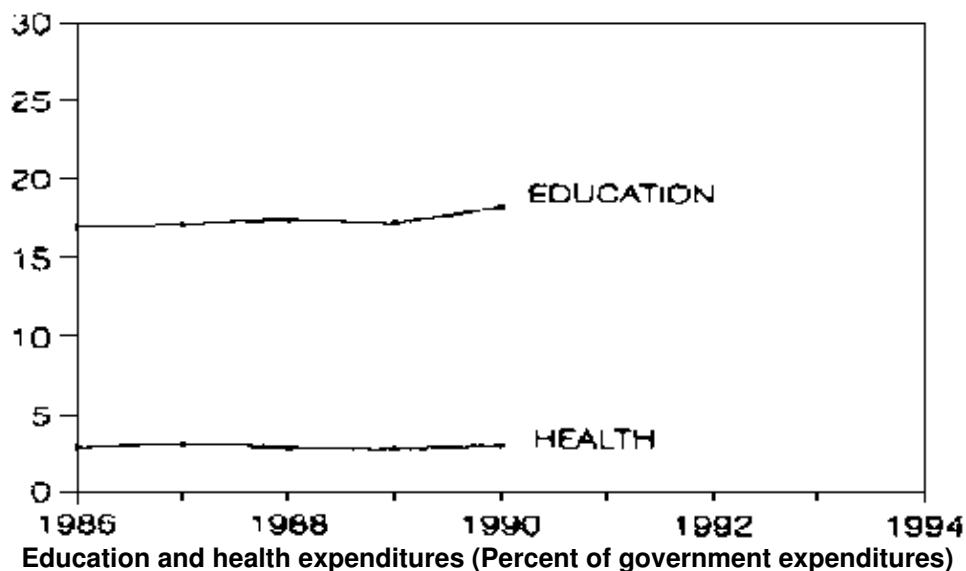


HEALTH



**PUBLIC EXPENDITURES**





Unemployment is a major problem in Morocco. One youth out of three, between the ages of 15 and 24, is unemployed in the urban centers. The government launched a drought relief programme in 1993 to provide alternative employment for some 300,000 farming families. Remittances from the migrant labor force (estimated at 1.7 million people in 1992) have provided a crucial addition to Morocco's invisible earnings and helped to support appreciable numbers of family members and other dependents in Morocco. The government also runs temporary employment programmes like the Promotion Nationale scheme, particularly in rural areas.

In the 1980s, Morocco adopted a more liberal agricultural policy, which involved decontrolling prices of agricultural and food products, while modernizing the marketing system and external trade regulations, and reducing or canceling the subsidies granted for most inputs (fertilizer, improved seeds, etc.). It was also decided to exempt farmers from payment of agricultural taxes up to the year 2000, so as to increase production and make progress towards food self-sufficiency. The peasant farmers, particularly in rainfed areas, are the least prosperous, despite some help from the government in recent years. At least one-third of them produce largely for subsistence purposes. The problem of inefficient smallholdings remains critical, given the fact that the vast majority of landholdings are under 5 ha. More rural people do not possess land at all, and work as agricultural labourers or sharecroppers.

The food price index with a base year (1980=100) has increased from 181 in 1986 to 236 in 1993. The daily calorie supply per capita has increased from 2963 in 1986 to 2978 in 1990. The figure for 1992 stands at 2984. The high levels are probably due to the substantial food subsidy by the government. Although food prices have been rising, the rates of increase are not as fast as the general CPI.

**Health.** Public expenditures for health in Morocco are very low, estimated at about 3% of total government expenditures in 1990. This is roughly equivalent to about \$7 per capita—a level below that of its neighbors in the region. The level of antenatal care is also low; the most recent estimate was about 25%, which is substantially below many developing countries. The immunization coverage in children has been high, but was shown to have been static or declining in recent years.

## Philippines

The population of the Philippines was 65.3 million in 1993, growing at a rate of 2.3% per annum. The nation consists of more than 7,000 islands, the main groups being Luzon in the north (where the capital, Manila, is), Visayas, and Mindanao in the south.

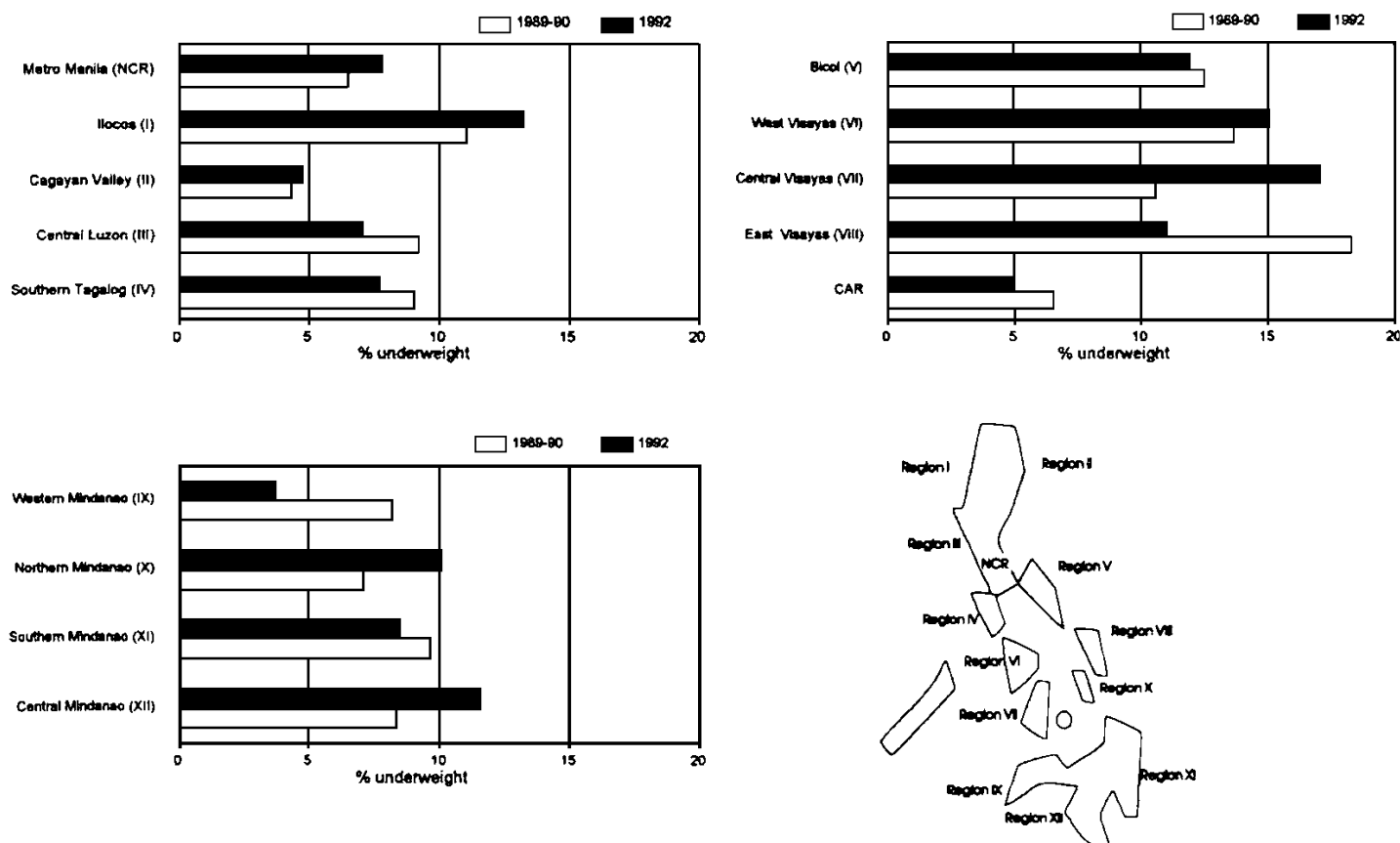
Following the election of President Ramos in 1992, some economic growth has restarted. The Philippines has yet to experience the rapid economic growth of neighbours in ASEAN, but there are hopes for this, which could bring quicker resolution of persistent nutrition problems. Nutritional trends have previously been described in the ACC/SCN's Update Report (1989, p. 120–123) and in the Second Report on the World Nutrition Situation (vol.II, p.32–37, 1993).

## Recent Trends in Nutrition

Two separate sources of data on nutrition are available for the Philippines. One is from repeated national surveys, carried out by the Food and Nutrition Research Institute (FNRI). The second is from the national weighing programme. Both these indicate some recent improvements in underweight prevalences. Trends may be compared between the two data sources, but estimates of levels are not directly comparable, because both sampling and cut-offs are different.

The FNRI nutritional survey of 1992 showed little change in underweight prevalences from 1990 – estimated at 33.5% in 1990 and 33.0% in 1992 (stunting prevalences did decrease somewhat more over this period, while wasting increased slightly – in line with the observation of little change in underweight). Recently published data gave an estimate of 29.6% prevalence of underweight in 1993, showing substantial improvement over 1992. Thus the national-level surveys indicate significant progress over 1990–93, equivalent (taking these two data points) to an improvement of 1.3 percentage points per year.

The national weighing programme data (Operation Timbang – OPT) that have been collected annually for more than 15 years now, show similar trends. Using the previous Philippine growth standards, the prevalence of children below 75% weight-for-age declined from 17.8% in 1990 to 16.3% in 1991 and 15.0% in 1992. This is an improving rate of around 1.5 percentage points per year. The OPT surveys, which are used for local nutrition programming, are among the most extensive anywhere. In 1992, coverage of preschool children was more than 85%, roughly 9.7 million children.



**Figure 1.** Philippines: Prevalence of Underweight (0–71 months) (<5th percentile, Philippines W/A standards) by Region

Source: FNRI (1993).

The trends in underweight using the FNRI surveys are compared by region for 1989/90 and 1992 in Figure 1. The wide regional variations in levels and trends in underweight, which were observed in previous reports, are confirmed in the most recent surveys. Reductions in the prevalence of underweight between 1989/90 and 1992 were observed in Central Luzon, Southern Tagalog, Bicol, Eastern Visayas, Western Mindanao, Southern Mindanao and the Cordillera Administrative Region. However, significant increases in underweight were observed especially in Central Visayas. The four regions with the highest underweight (and stunting) prevalences in 1992 were Central Visayas, Western Visayas, Eastern Visayas, and Ilocos, while regions



whose average prevalences were lowest were Western Mindanao, Central Luzon, the Cordillera Administrative Region, and the National Capitol Region (Metro Manila). The most important improvements in nutrition occurred in Bicol and Eastern Visayas, both of which had historically had high rates of underweight.

### **Factors Affecting Trends in Nutrition**

**Economic Growth.** In 1993 GNP per capita in the Philippines was estimated at U.S.\$830. Per capita GDP grew at an average annual rate of 0.65% between 1986 and 1993. Growth was more rapid than this average for 1986 to 1990, but virtually stopped thereafter.

Despite considerable recovery during 1986 and 1989, Philippines is behind its neighboring countries regarding foreign investment inflows, export performance, and income growth. A string of major natural disasters in 1990 and 1991 worsened the growth.

Helped by an economic recovery programme and lower inflation, the most recent report by the World Bank indicates that the poverty incidence in the country has declined somewhat from 45% in 1985 to about 41% in 1991, with most of the gains accruing to the poorest. This trend in poverty is generally in line with the slight improvements in the nutrition situation in the early 1990s compared to the last half of the 1980s.

**Household Food Security.** Food access and utilization are the most significant food security constraints, with aggregate food supplies generally adequate at the national level although domestic food production is often unstable. Inflation for the economy as a whole has risen faster than food prices, making food relatively less expensive than non-food items. However, chronic deficiencies in dietary quality persist as a problem among both adults and children.

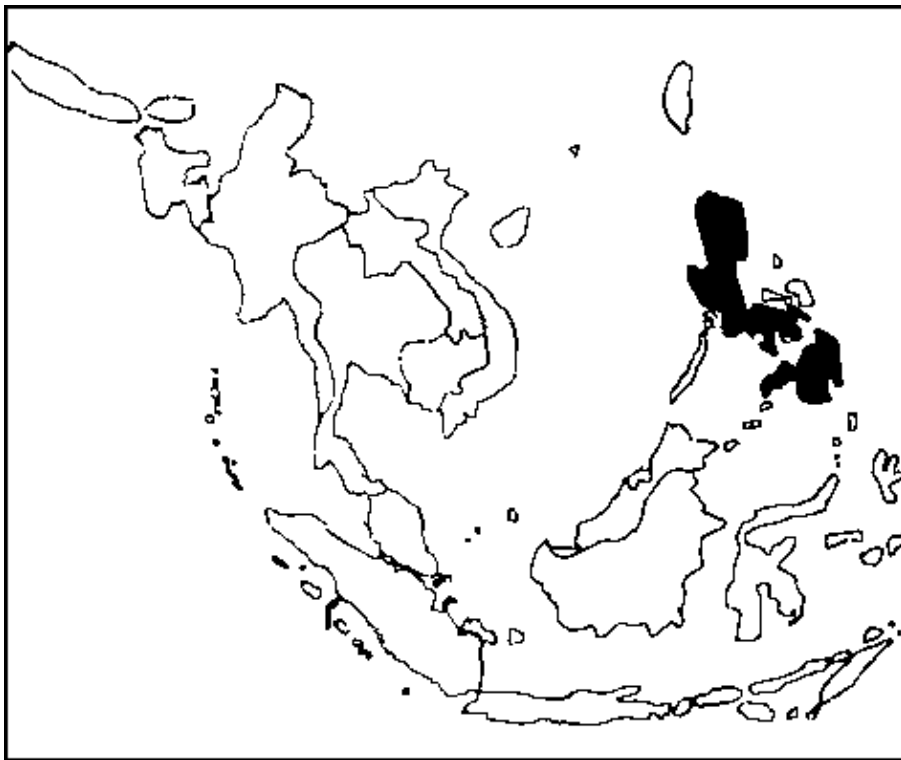
Overall, the nutrition situation in the Philippines seems to be improving as the economy grows and poverty declines somewhat. Along with economic growth and poverty reduction, calorie availability has increased.

**Health, Education, Women's Status.** One of the positive trends in the health sector is the continued increase in the coverage of immunization of infants. DPT immunization now covers 88% of all infants, compared to 79% in 1988, and measles vaccination now covers 85% compared to 77% in 1988. The level of access for women to antenatal care now reaches 80%.

The absolute per capita expenditures for education and health in the national budget have risen, although the proportions of the total budget for education shows a declining trend.

A recent DHS survey in the Philippines indicates that the current fertility level remains relatively high, with a total fertility rate of 4.1 children per woman. This result indicates that the Filipino women have the highest fertility rate amongst women in the Southeast Asian region. The trend also indicates that the fertility dropped only slightly compared to the mid-1980s, which was estimated at 4.3 children per woman.

The DHS surveys also showed that breastfeeding of children is less common in the Philippines than in other developing countries, with only about a third of all infants exclusively breastfed at age younger than three months. Weaning is done at a very young age. By age 4 to 6 months, the proportion of infants that are exclusively breastfed drops to less than 10%. These sub-optimal practices contribute to the high levels of underweight and stunting in very young children.

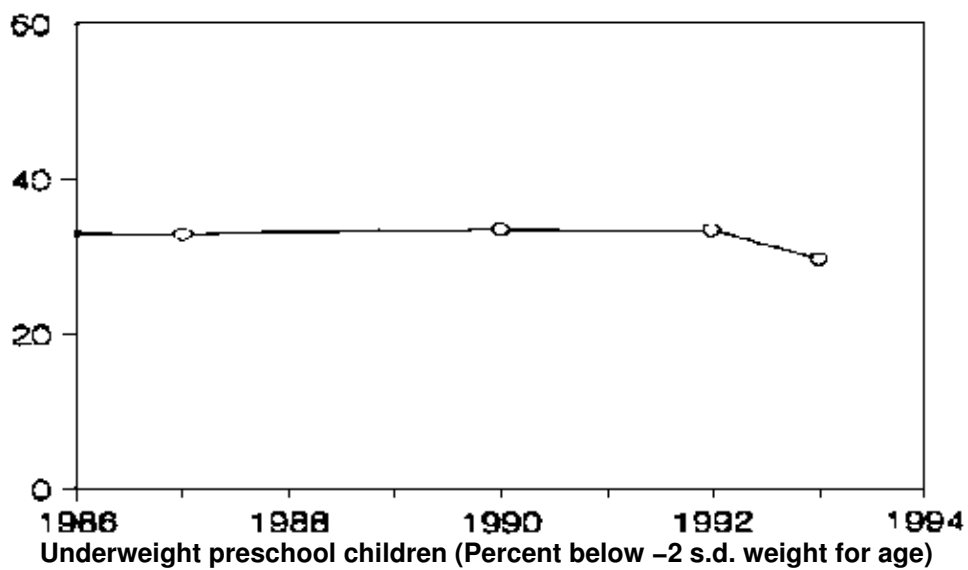


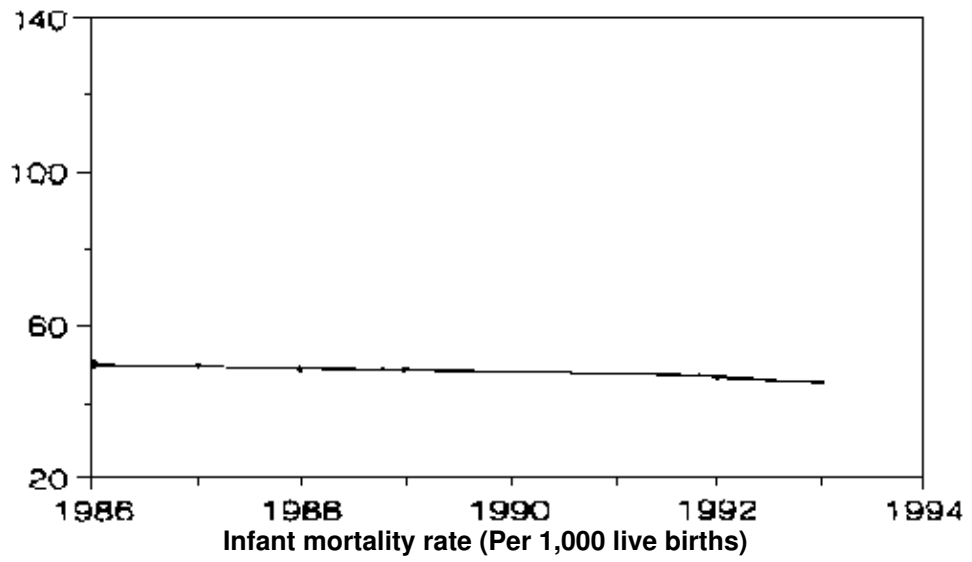
**Philippines**

**(Estimates in 1993)**

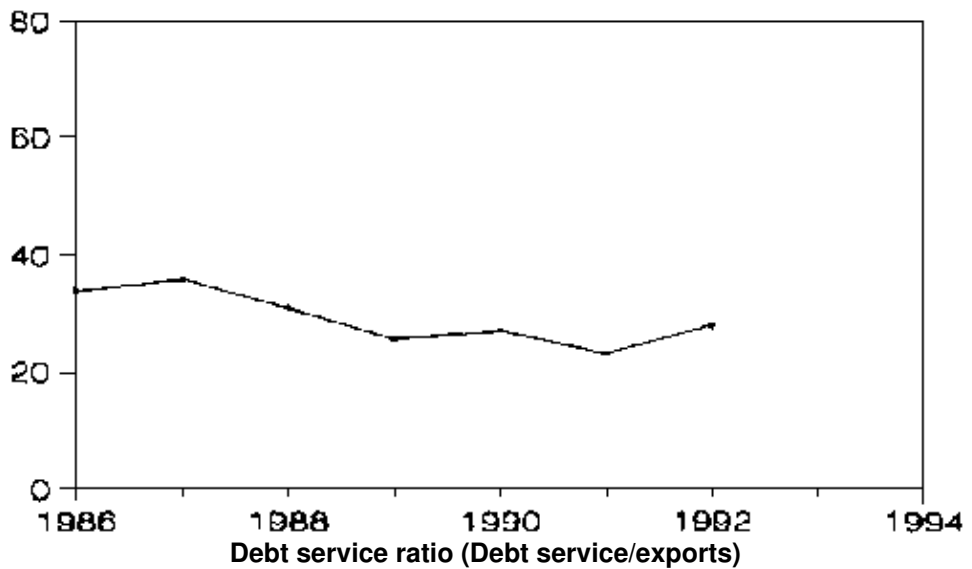
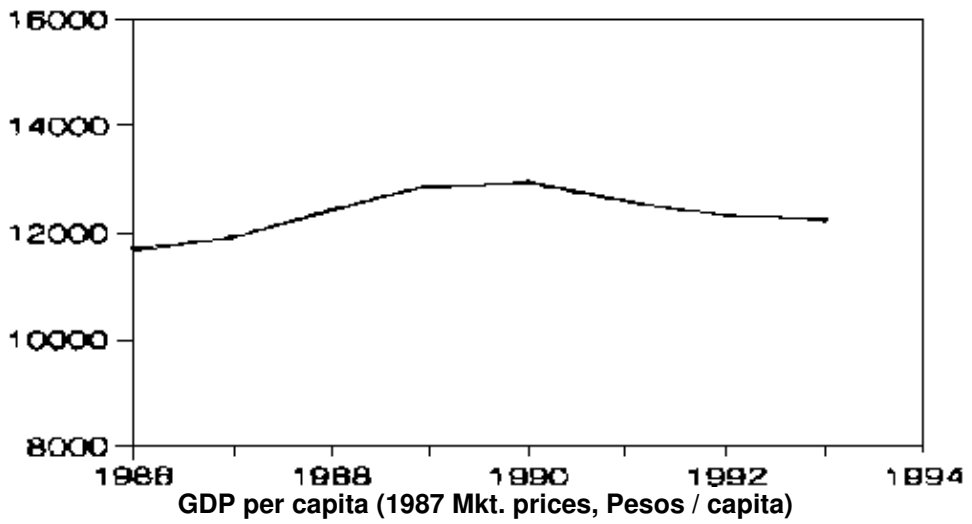
Population : 66 million  
 Population Density : 210 per sq. km.  
 Population Growth Rate : 2.3% per annum  
 Urban Population : 45%  
 IMR : 45  
 GNP US\$ (Per Capita) : 830  
 (WB Atlas Methodology)  
 PPP estimates of GDP : 2440  
 (\$ Per Capita, in 1991)

**CHILD GROWTH AND SURVIVAL**

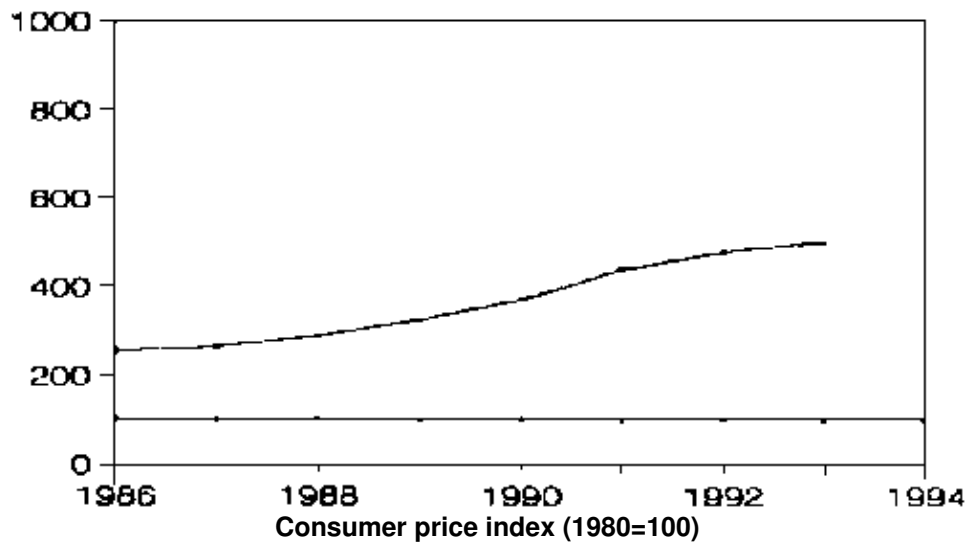
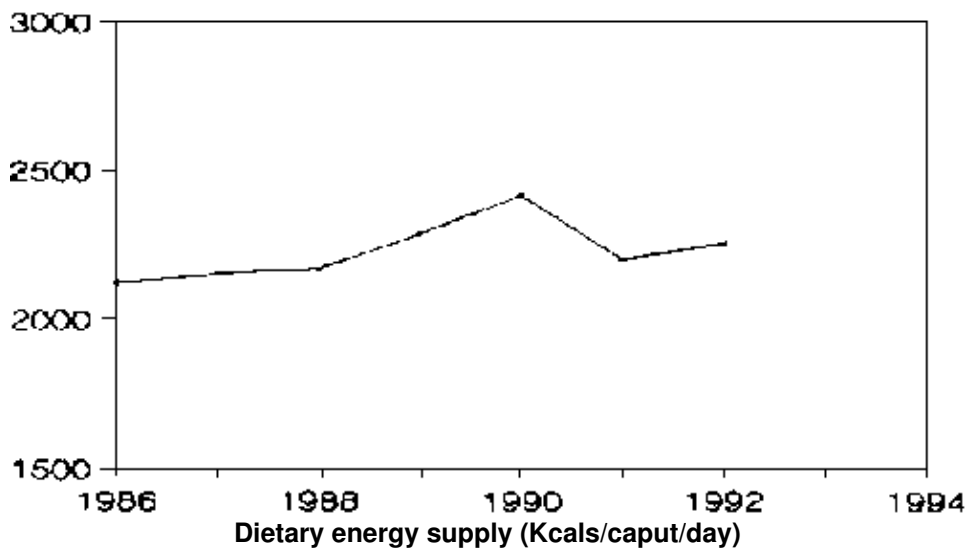
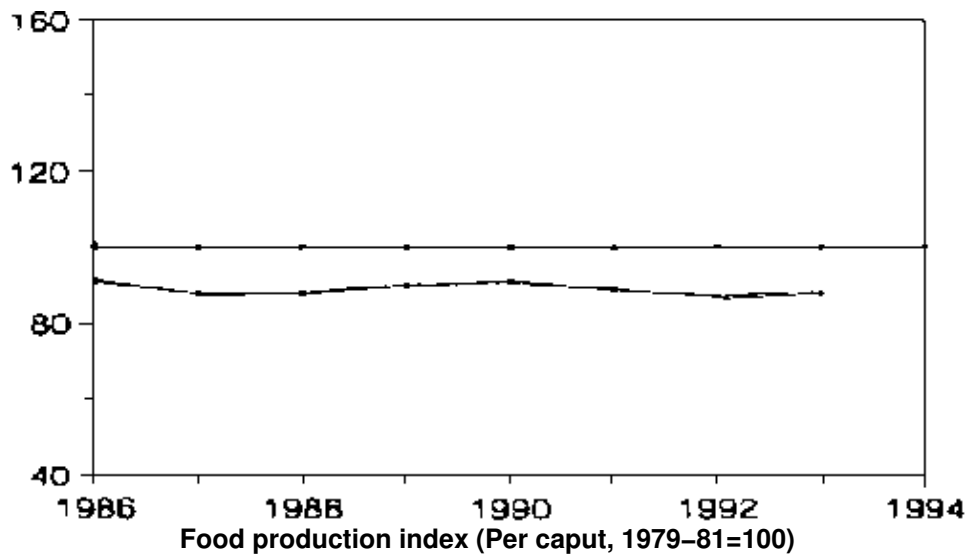


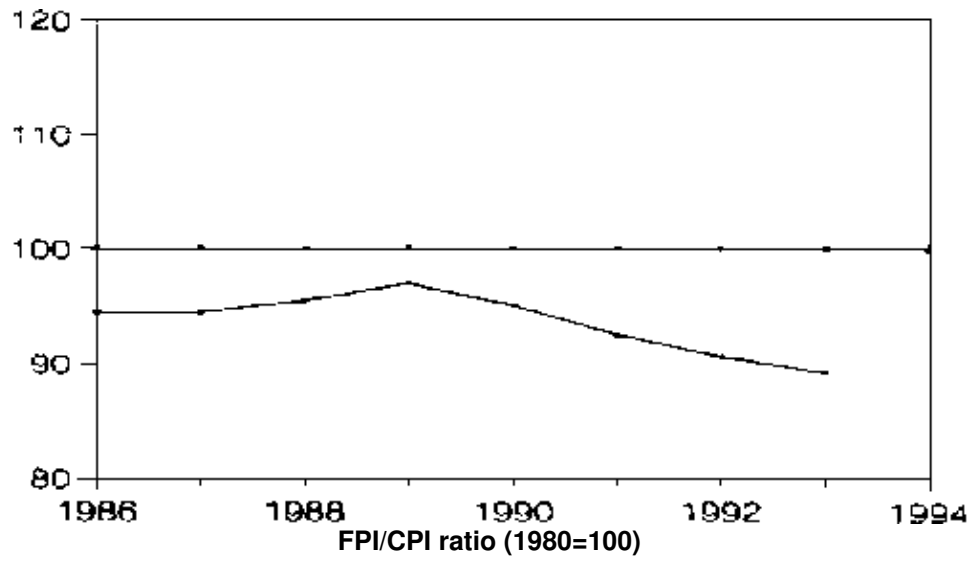


### ECONOMICS

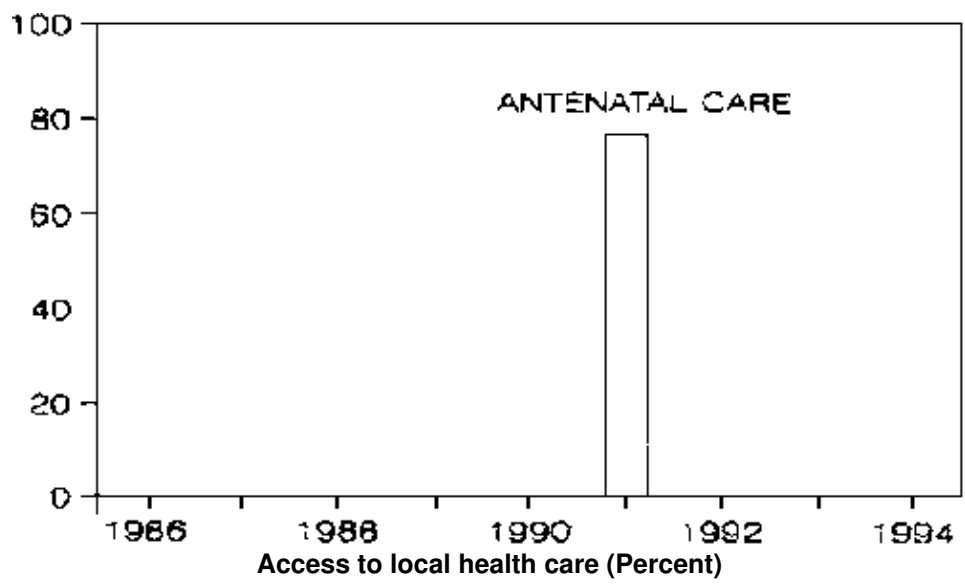
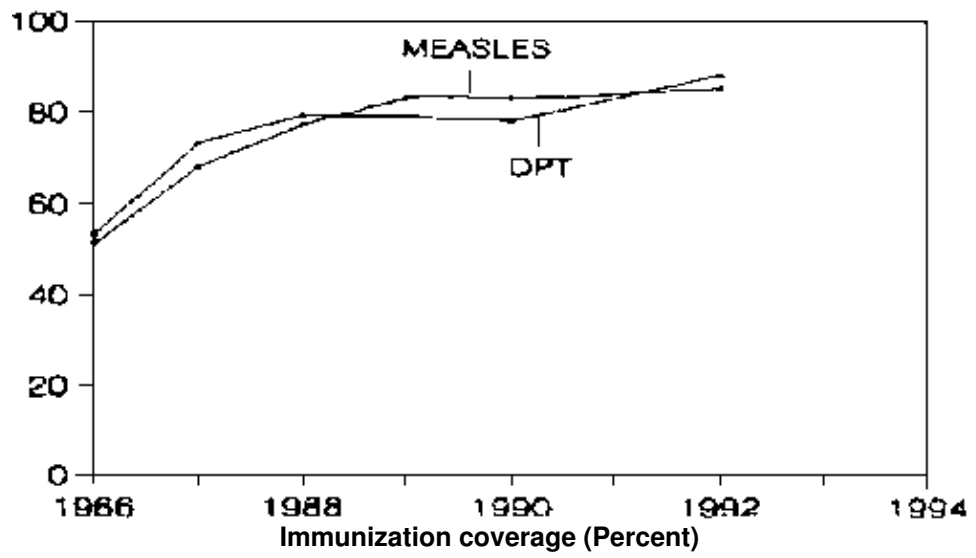


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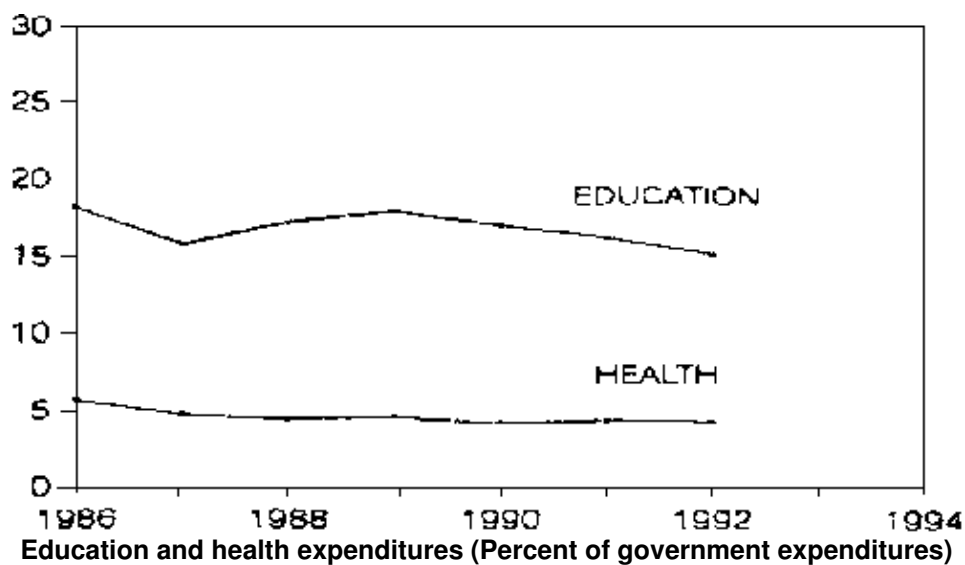
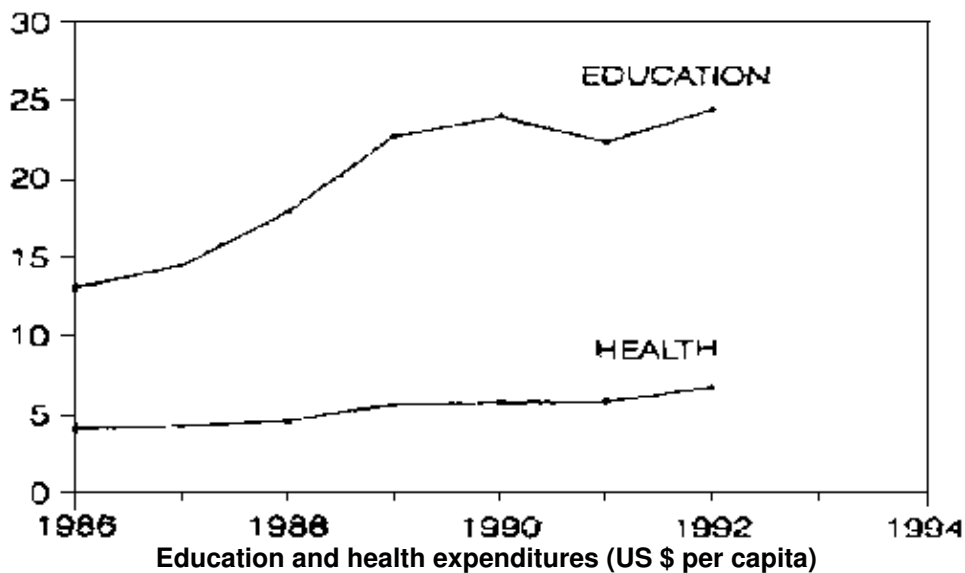




**HEALTH**



**PUBLIC EXPENDITURES**



## Senegal

Senegal is a semi-arid Sahelian nation of 8.2 million inhabitants. Population is growing at the rate of 2.8 percent per annum and population density is estimated to be 39 per sq. km. The country is predominantly rural with limited natural resources. Economic growth is constrained by dependence on a few export commodities (especially groundnuts, phosphates, and fishery products). Recent currency devaluation brought widespread hardship, for example through price rises.

### Recent Trends in Nutrition

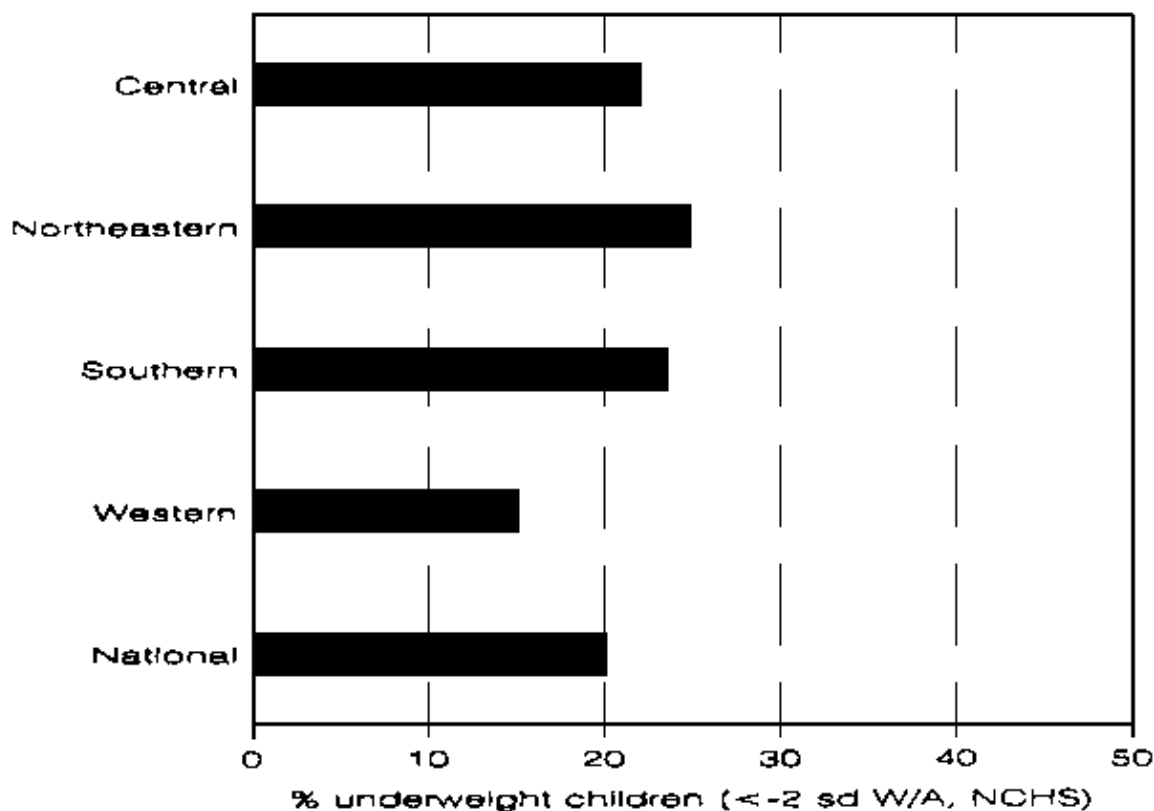
Although Senegal has one of the better situations in nutrition in the Sub-Saharan Africa region, the prevalence of underweight children (below  $-2$  s.d. weight-for-age NCHS) is estimated (for 0–59 months old children) to have increased to the 1992 level of 20.1% from 17.5% in 1986. The nutrition survey in 1986 assisted by DHS (covering children 0–36 months) can also be compared with the same age group in a second DHS-assisted survey in 1992/93. This indicates an increase in underweight prevalence from 21.6% in 1986 to 23.5% in 1992/93 (among 0–36 month-old children).

The rural areas of the country have nearly 70% higher prevalence of underweight children compared to urban areas (25% vs. 15%). A regional breakdown of underweight prevalences for 1992/93 (Figure 1) shows substantial variability by area, with the Western region having considerably lower prevalence (15%) than other regions (22 – 25%).

### Factors Affecting Trends in Nutrition

**Economic Trends.** In 1993 per capita GNP was estimated at U.S.\$730. Annual per capita GDP growth during 1986–93 was –0.9%. An economic downturn occurred after 1990.

The economy is highly vulnerable to weather changes and adverse movements in international commodity markets, and is heavily dependent on external funding. Most of Senegal is in the Sahelian zone and has irregular and uncertain rainfall with generally poor soils. Agriculture is the primary source of income for most of the population. Millet and sorghum are produced as the primary subsistence foods and groundnuts are the primary commercial crop. Cowpea is also grown for subsistence.



**Figure 1.** Senegal: Prevalence of Underweight Children, (0–59 months), 1992/93

Source: MEF/DHS 1994.

The regions facing the sea are dependent on fisheries, which in fact accounts for the biggest source of its export earnings (roughly \$217 million in 1991). Groundnut products are the country's second most important source of foreign exchange. Groundnut production accounts for around 40 percent of cultivated land (taking up two million hectares) and provides employment for as many as a million people. Technical, institutional, and environmental factors are the main factors in restricting the agricultural sector from becoming more competitive and productive.

**Food Security.** Senegal is a food-deficit country. In the 1993/94 crop season for example, the cereal production of about one million MT was not be enough for the domestic requirement of about 1.7 million MT. Most of the 0.7 million MT is met by commercial imports (mostly of wheat and rice), with a small portion from food aid.

The food production index (base year 1979–81=100) was 110 in 1993 as compared to 100 in the previous year. Total food aid was estimated to be 53 thousand MT in 1993, and is expected to increase for 1994.



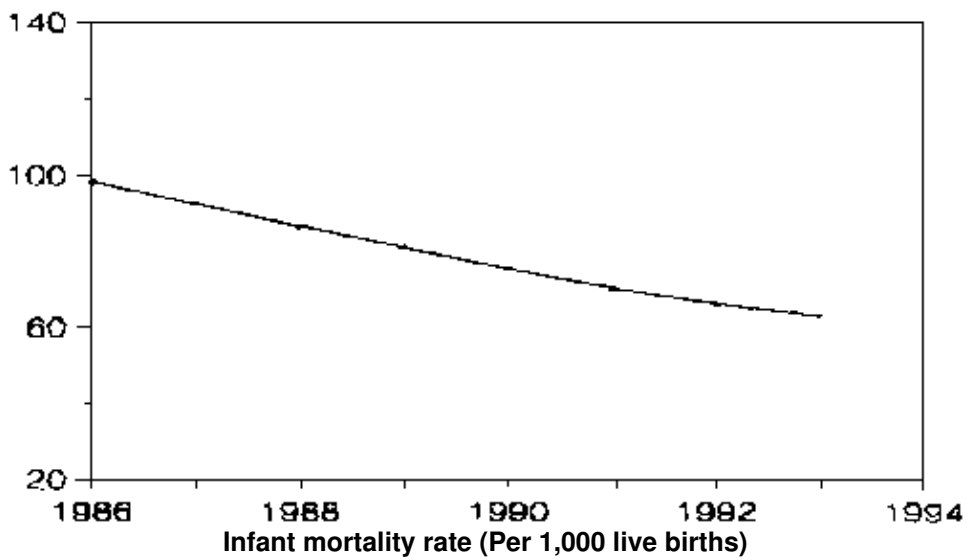
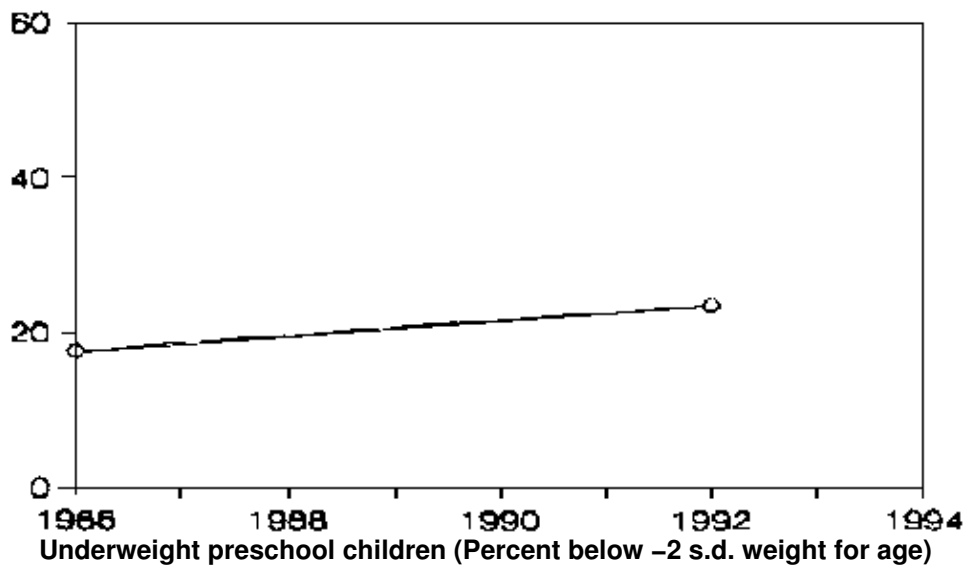
**SENEGAL**

**(Estimates in 1993)**

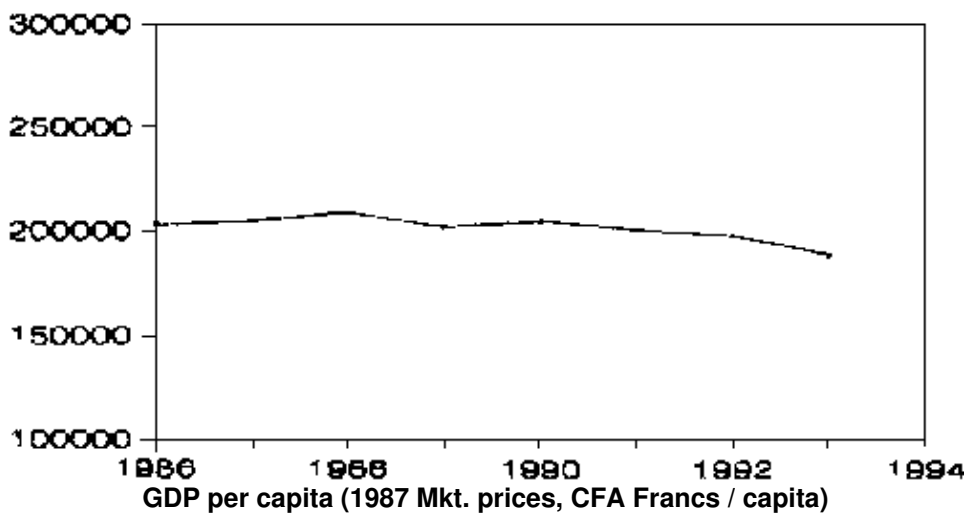
Population	: 8.2 million
Population Density	: 39 per sq. km.
Population Growth Rate	: 3% per annum
Urban Population	: 41%
IMR	: 63
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 730
PPP estimates of GDP (\$ Per Capita, in 1991)	: 1680

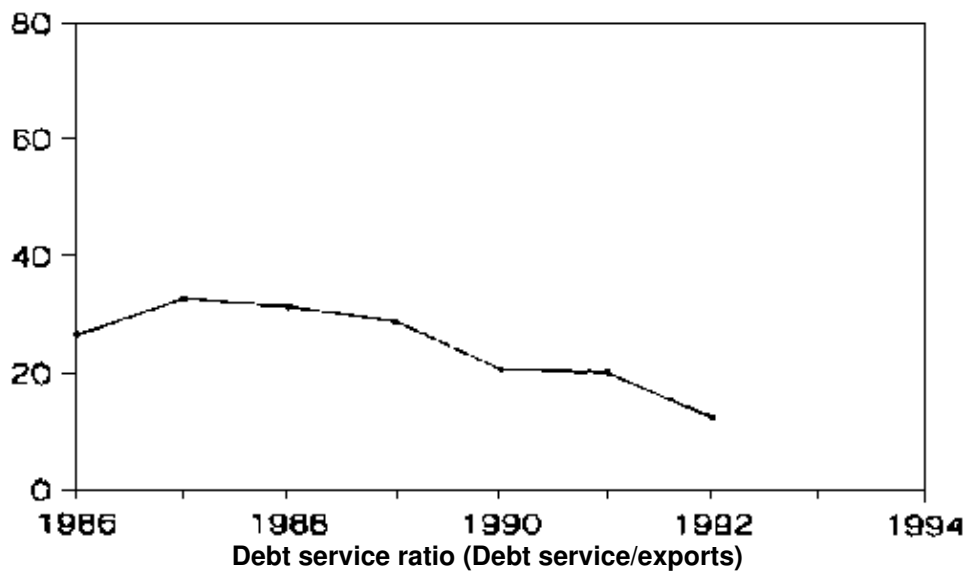
**CHILD GROWTH AND SURVIVAL**



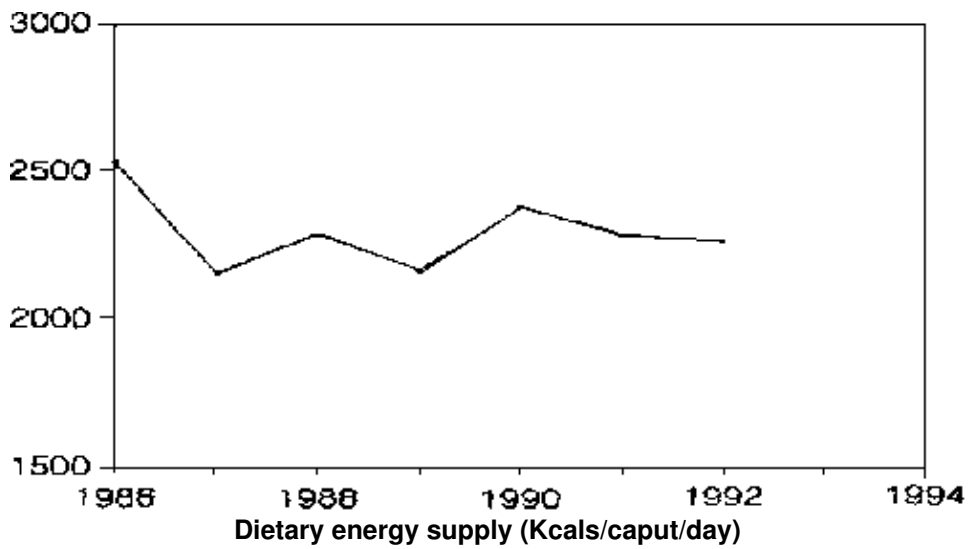
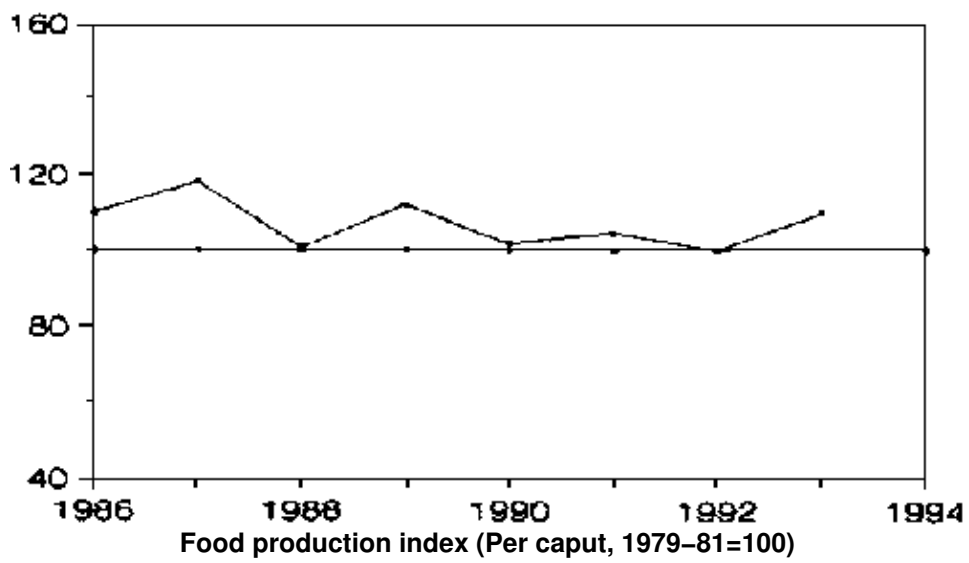


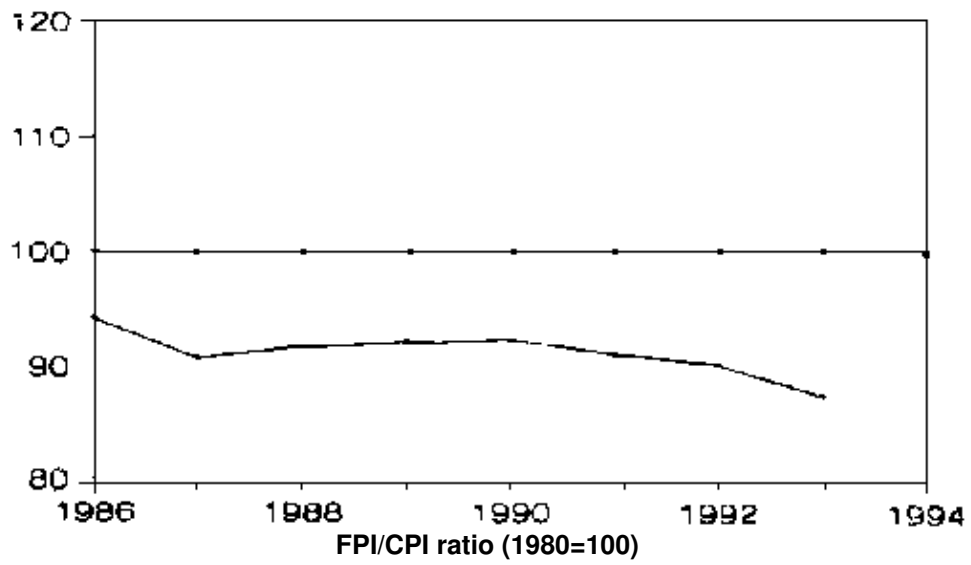
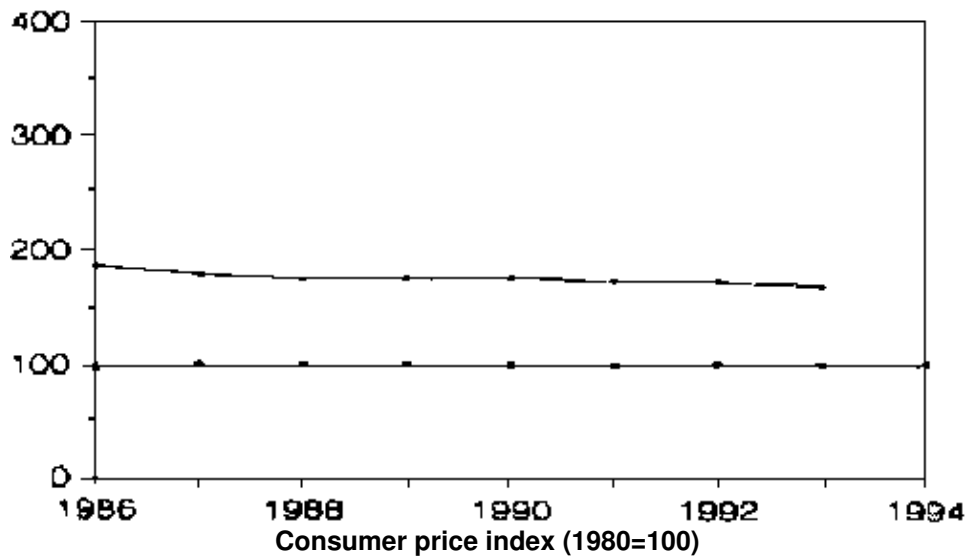
**ECONOMICS**



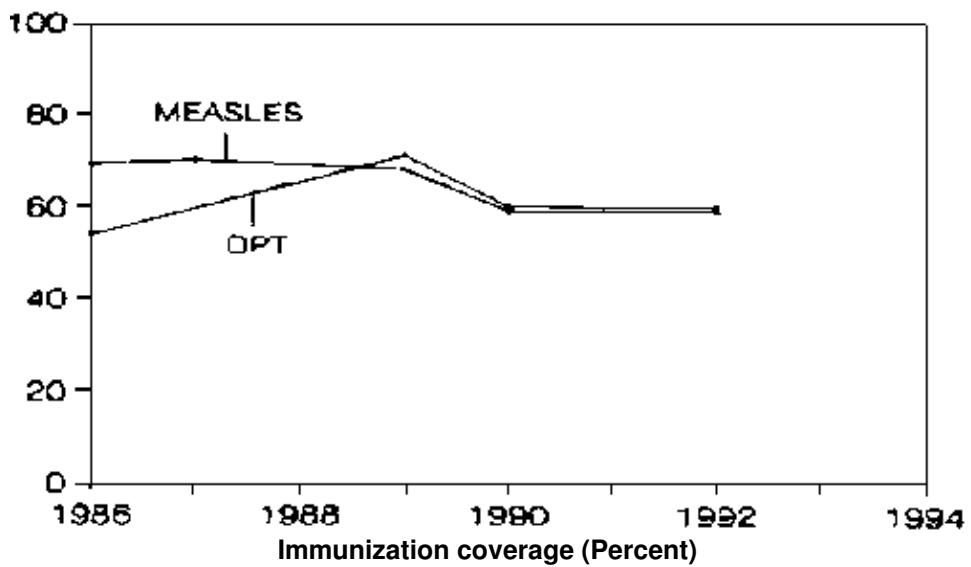


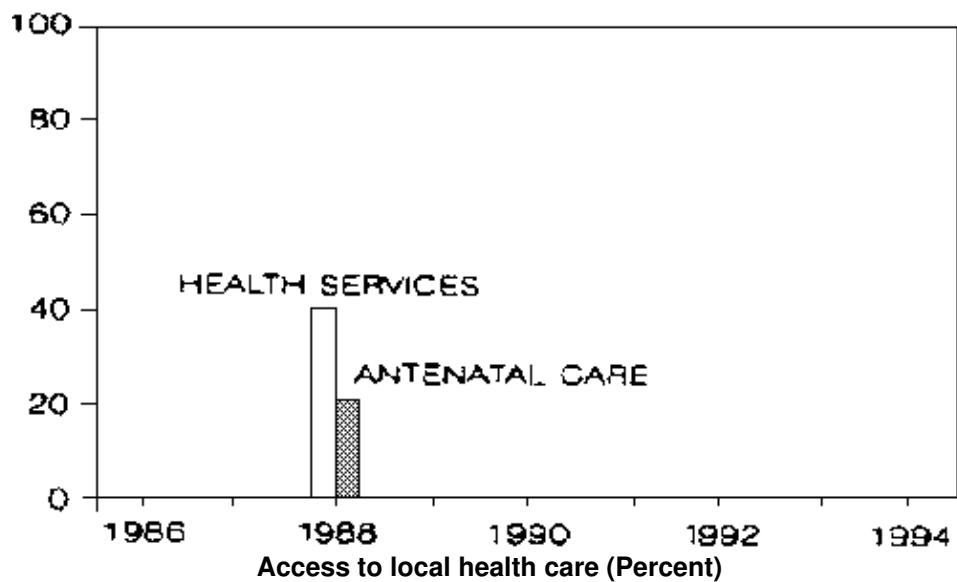
FOOD



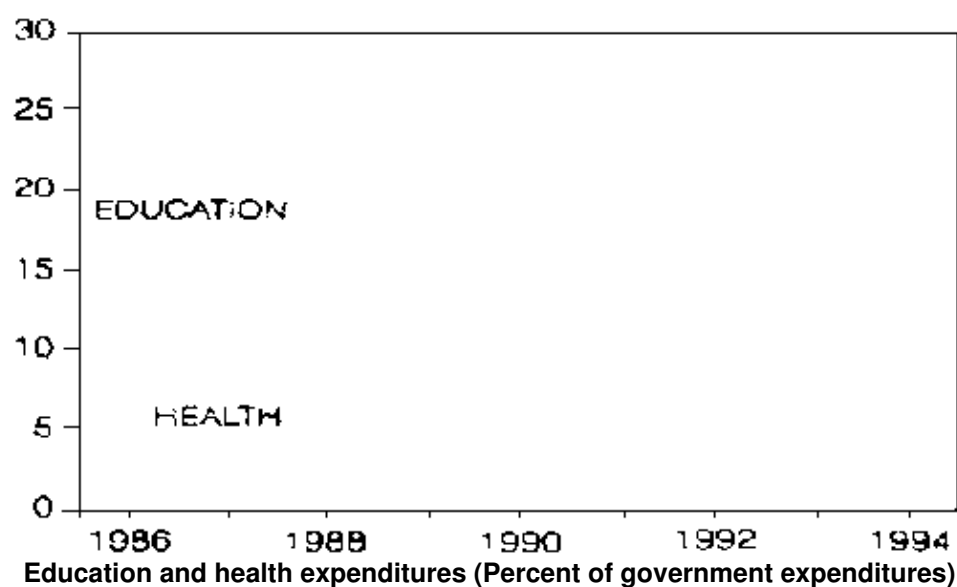
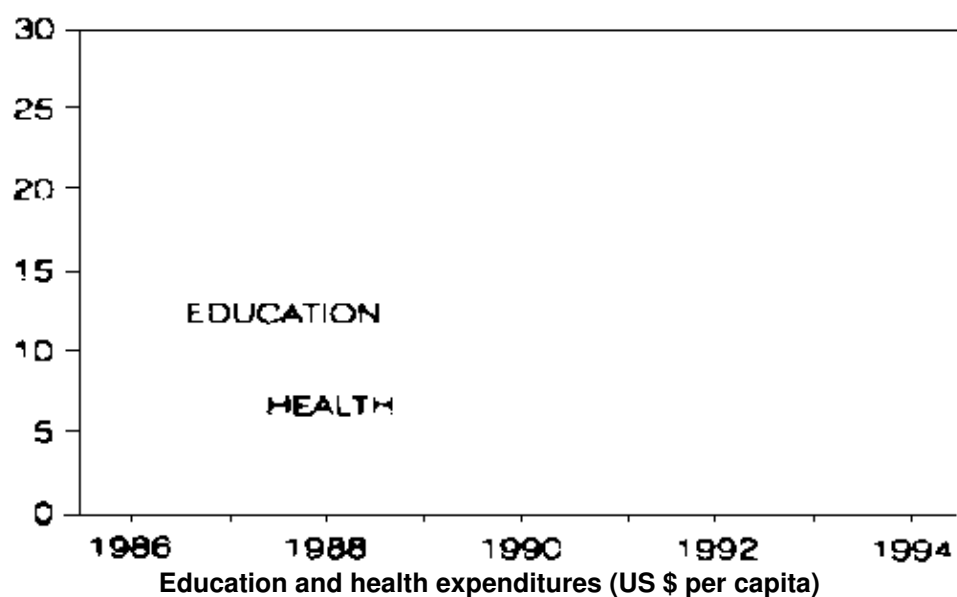


HEALTH





**PUBLIC EXPENDITURES**



Estimated per caput consumption of cereals is 187 kg. per year and the share of cereals in total calorie intake is 61 percent. Per capita calorie supply has been erratic since 1986, falling from high levels of 2523 in 1985, to around 2300 in the early 1990s.

**Education, Health, Women's Status.** Health service provision in the country is limited. The most recently available data shows that around 40% of the population had access to health services and only 20% of mothers had access to antenatal care from clinics. About 3% of the national budget goes to health care, which is lower than average for the region. Senegal's population is growing fast and putting an adverse impact on the environment and overall economy. Overall enrollment increased by one-third among the first and the second halves of the 1980s, with female enrollment more than male. The government allocates about 17% of the national budget to education. Enrollment ratio of primary education is estimated to be 58 percent.

Average life expectancy has increased from 45 in the early 80s to about 47 in the recent years. Infant mortality has decreased from around 120 in the early 80s to 63 in the 1992. Primary health care has been expanded and there is change in allocation of resources for health care from urban to rural areas. Immunization coverage of infants has been declining in the last few years. In 1988 coverages for measles vaccination was at 70% and fell to about 59% in 1992.

## **Zambia**

Zambia is a large, landlocked country covering an area of 752,614 square kilometers with no navigable rivers. Its population is estimated to be 8.89 million in 1993, growing at an annual average growth rate of 3.4 percent per year. About 50% of the population is urban, high in comparison with most African countries. A new government headed by President Chiluba was elected in October 1991, and initiated extensive economic reforms, including a three year structural adjustment programme begun in March 1992.

### **Recent Trends in Nutrition**

Economic recession intensifying in the early '90s, and drought in 1991/92, had major effects on nutrition. Trends in underweight can be approximated, although there are some gaps, using two sources: the national nutritional surveillance programme, which uses clinic data; and three national surveys, one of which covered rural areas only. Combining the available results, nationally and in selected provinces for the recent years, gives the following estimates, which are also the values plotted on the graphics page for Zambia.

# Map of Zambia



Map of Zambia

Note: The dashed lines indicate province boundaries.

A.

Year	Prevalence Underweight
------	------------------------

1985	26.5% National survey <80% wt/age, urban & rural (see "Notes", ref 1)
1991	26.8% National survey <80% wt/age (ref 2)

B.

1990	27.8%
------	-------

		Rural, crop forecast survey, Dec 89 – Jan 90 (ref 3)
1991	26.3%	Rural, priority survey, Oct 91 (ref 2)
1992	29.0%	Rural, DHS survey, Jan–May 1992 (ref 4)

C.

National Nutritional Surveillance Programme (Clinic Data) In Eastern and Southern Provinces (ref 5)

	Eastern	Southern
Feb 1993	33.4%	27.8%
Jan 1994	30.7%	24.9%
May 1994	31.7%	25.8%

The results, which should only be compared within the sections A, B & C, show essentially unchanged prevalences between 1985 and 1991 (section A). In the early 1990s, with deteriorating economic conditions and structural adjustment, prevalences of underweight increased; this is shown in the table, section B, for rural areas only; urban trends are thought to be worse, but data are not available.

The 1991/92 drought hit hardest just after the 1992 survey, so average prevalences would have worsened beyond the 29% estimated in early 1992 (rural areas) – although more severe deterioration was almost certainly contained by extensive relief efforts, with major inputs from NGOs. The harvest in April–June 1993 was good, and the provincial data available (examples shown in section C of the table) indicates improvement by 1994. Regional comparisons can be made from the national demographic and health survey of January to May 1992. Overall, this shows significant urban/rural differences – underweight prevalences estimated as 21% in urban areas, 29% in rural. Between the 9 provinces, the range is from a low of 22–23% in Central, Copperbelt, Lusaka and Southern; to the highest values of 30% in Luapula and 38% in Northern. These provincial rankings are similar when stunting is used – e.g. 34% in Central to 57% in Northern, with a national average of 40% (33% in urban areas, 46% in rural); these values of stunting are high (and were so in earlier years), and indicate a continuing long-term problem of malnutrition, over and above those caused by drought.

### Factors Affecting Trends in Nutrition

**Economic Growth.** In 1993 per capita GNP was estimated at U.S.\$370. Per capita GDP declined by –2.0% per year between 1986 and 1993. Major characteristics of the economy are heavy reliance on a single export product (copper), a very high debt service burden, and excessive public sector involvement in the goods and services sectors.

An important part of the explanation for the nutrition situation in Zambia is the deterioration in the economy of the country over the last decade. The country's wealth is founded mainly on copper, its largest export. Development of its infrastructure and public services is tied to earnings from this commodity.

The economic and social effects of the devastating slump in world price of copper since 1975 persist to this day. Zambia's mineral production accounts for around 20% of GDP, and 80% of all export earnings. Since the early 1980s the world copper prices and demand have remained weak mainly because of depressed

economic conditions in the industrialized countries. This factor, plus drought, led to increasing debt.

Official figures put average inflation at 175% in 1992, a sharp increase from 55 percent in 1988. This increase was mainly due to aggressive action on the exchange rate, a subsidy reduction for maize, and price liberalization.

Total debt at end-1991 estimated to be U.S.\$7.3 billion. Zambia's external debt per head excluding short term debt is one of the highest in the world at nearly U.S.\$800 per head.

The year 1992 was a particularly bad year for Zambia, with the worst drought of the century in southern Africa. Agricultural production slumped to a six-year low, with maize production only a third of the previous year's level. That same year, the government devalued the Zambian currency against the dollar by 30% and inflation rose to an all time high, helped by the removal of 90% of the maize subsidy.

**Food Security.** The long-term food security problem in Zambia is not so much related to inadequate food supplies or food production at the national level as it is to general decline in per capita real income under rapid inflation. Per capita food production index with base year 1979-81=100 decreased to 78 in 1992 due to drought as compared to 91 in the previous year and it is estimated to be 99 in 1993. Yields are expected to be average in 1994.

In 1992, the ratio of the food price index to the consumer price index rose to nearly 110, due to higher inflation rate for food commodities. This ratio dropped again in 1993, which may have contributed to nutritional improvement.

Agriculture sector share in GDP has decreased from 16% in 1991 to 8% in 1992 mainly due to drought. Zambia has considerable agricultural potential, with about nine million hectares of reasonable to good arable land. Despite its potential only about 20% of arable land is currently utilized, most of it for rainfed maize production. Other significant crops are sorghum, cassava, millet, sunflower, groundnut, cotton, tobacco, sugarcane, paddy rice and variety of vegetables.

A number of measures have been taken in recent years to alleviate food insecurity. In 1989, when the urban poor were increasingly unable to purchase adequate food, the government initiated an urban food subsidy scheme, through food coupons, for the poorest households. During the drought, support programmes included distribution of maize at half price to the most seriously affected households, additional income support for the poorest, labour intensive public works programmes, larger budget allocations for the social sector, and other measures. By many accounts these measures were widely successful in mitigating the worst effects of the drought on nutrition.

**Health, Education.** The government is taking major steps to control deterioration in social development. The government is giving more focus on women's education and primary health care. The government is also trying to increase women's participation in the labor force, and their access to credit. Health and education expenditures have increased since 1984 but still the overall conditions are not satisfactory.



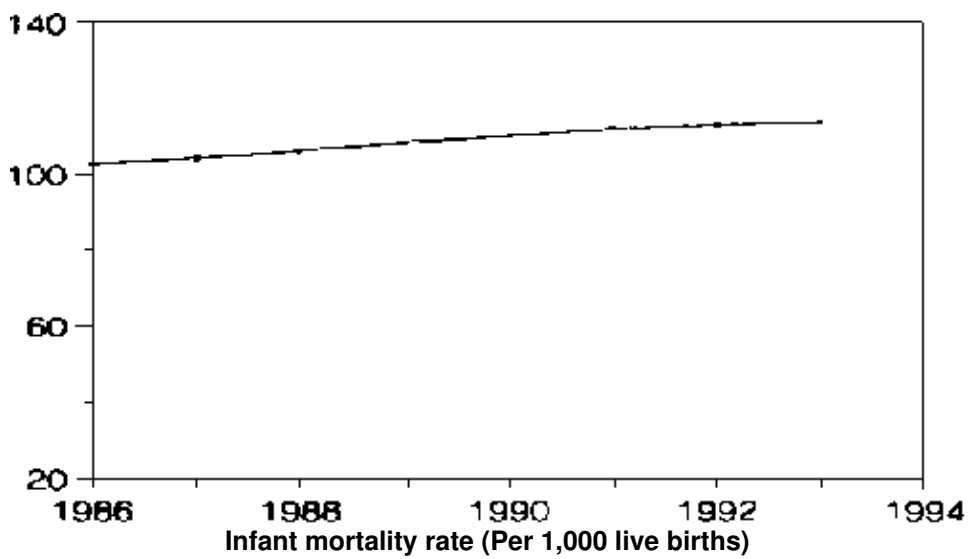
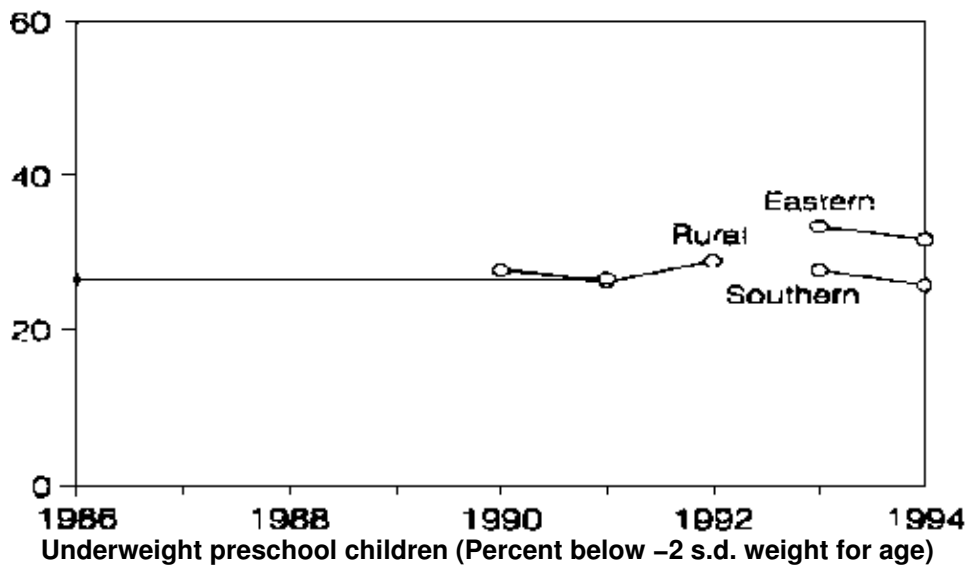


**ZAMBIA**

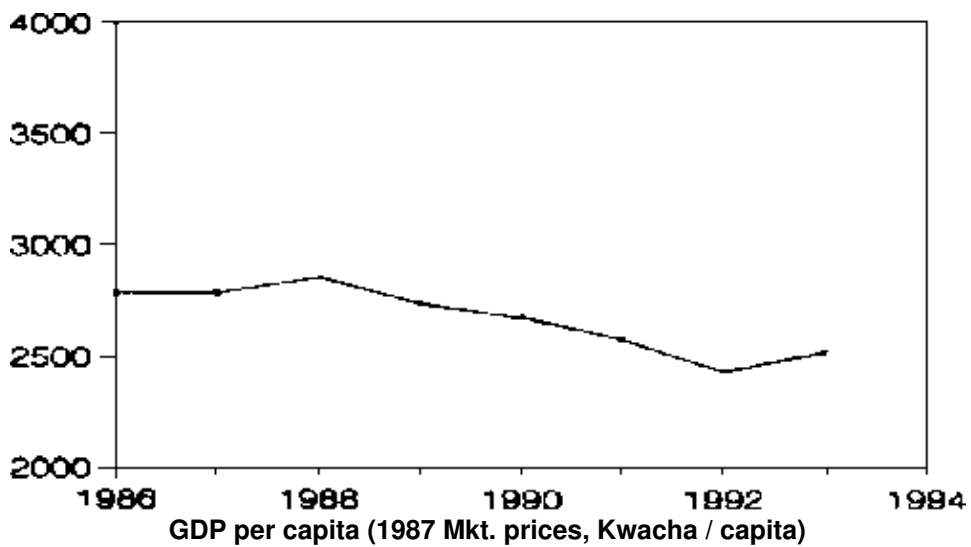
**(Estimates in 1993)**

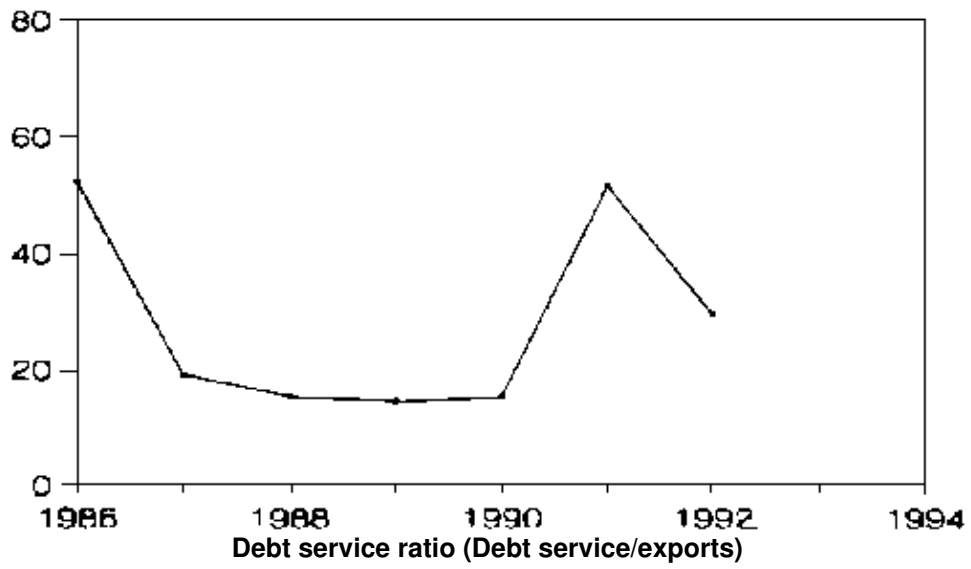
Population	: 9 million
Population Density	: 11 per sq. km.
Population Growth Rate	: 3% per annum
Urban Population	: 43%
IMR	:114
GNP US\$ (Per Capita) (WB Atlas Methodology)	: 370
PPP estimates of GDP (\$ Per Capita, in 1991)	: 1010

**CHILD GROWTH AND SURVIVAL**

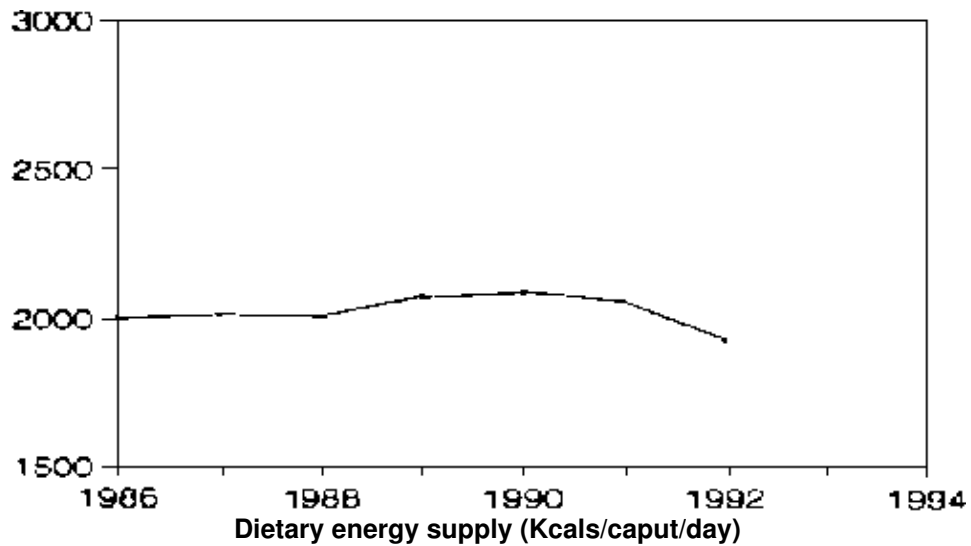
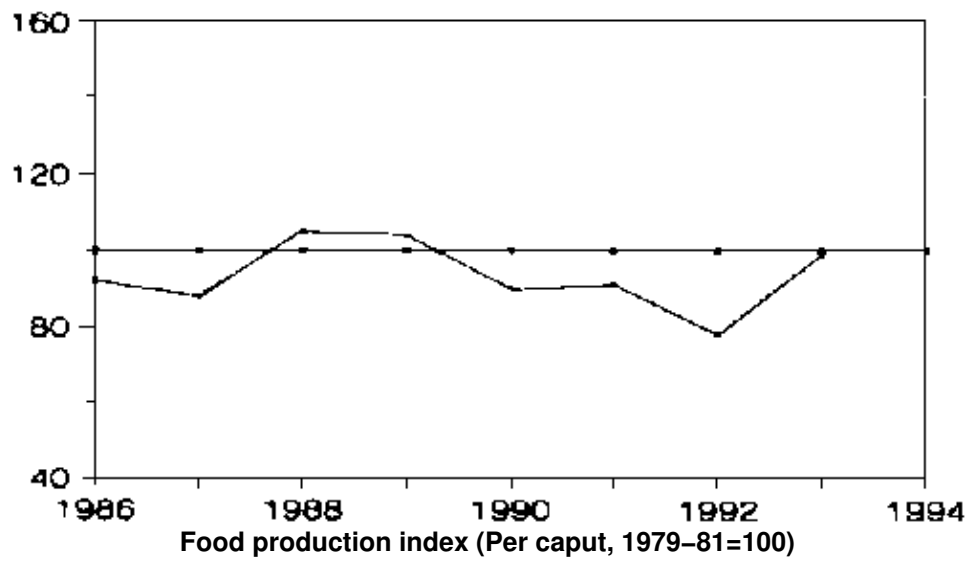


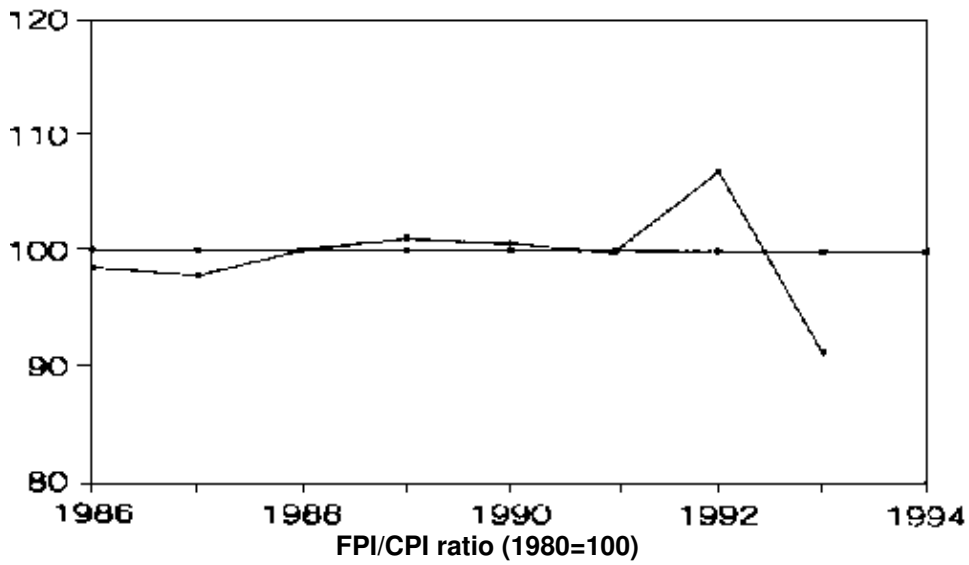
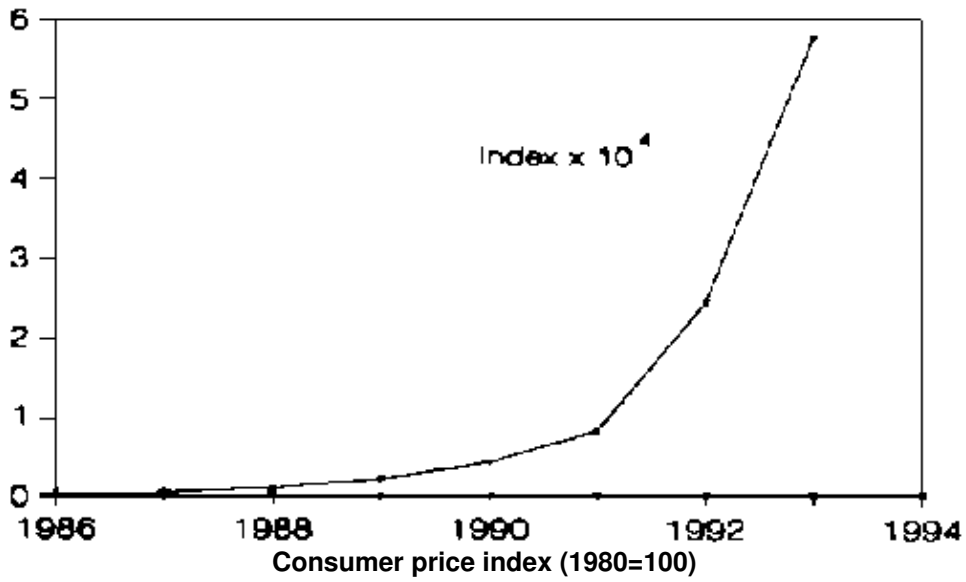
**ECONOMICS**



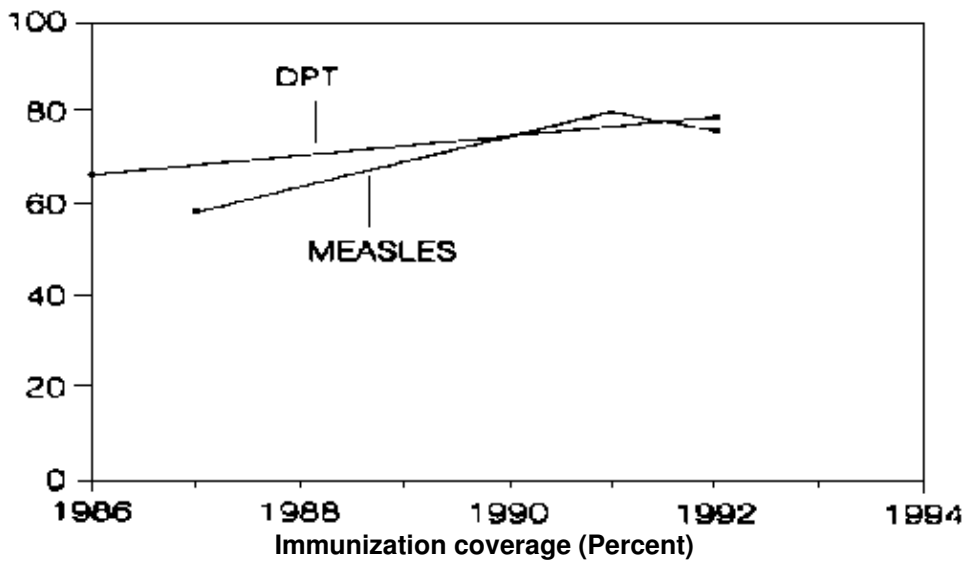


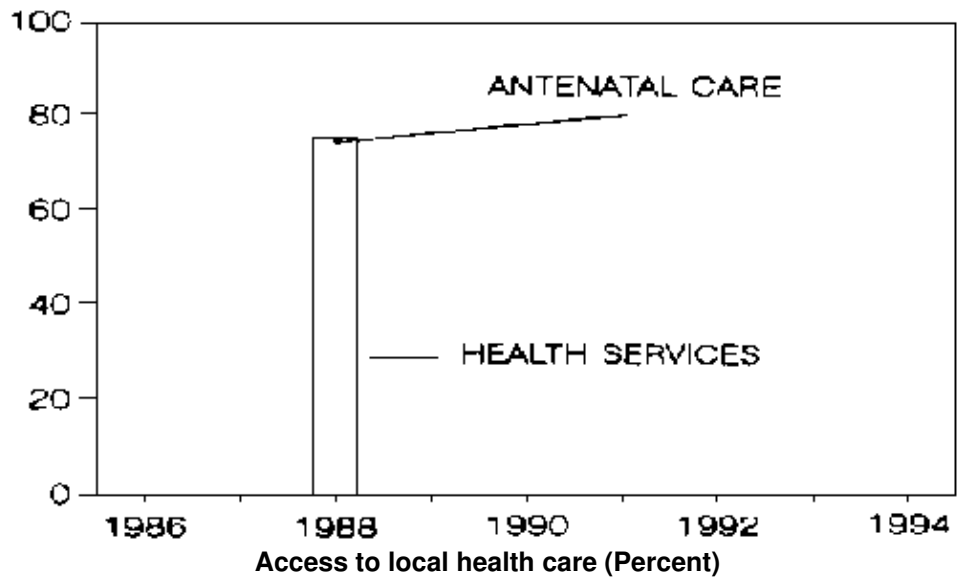
FOOD



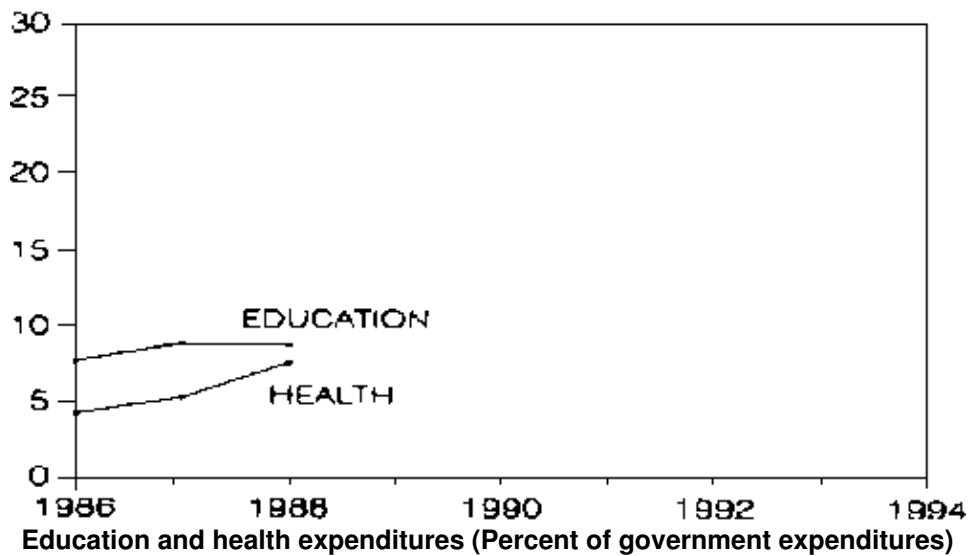
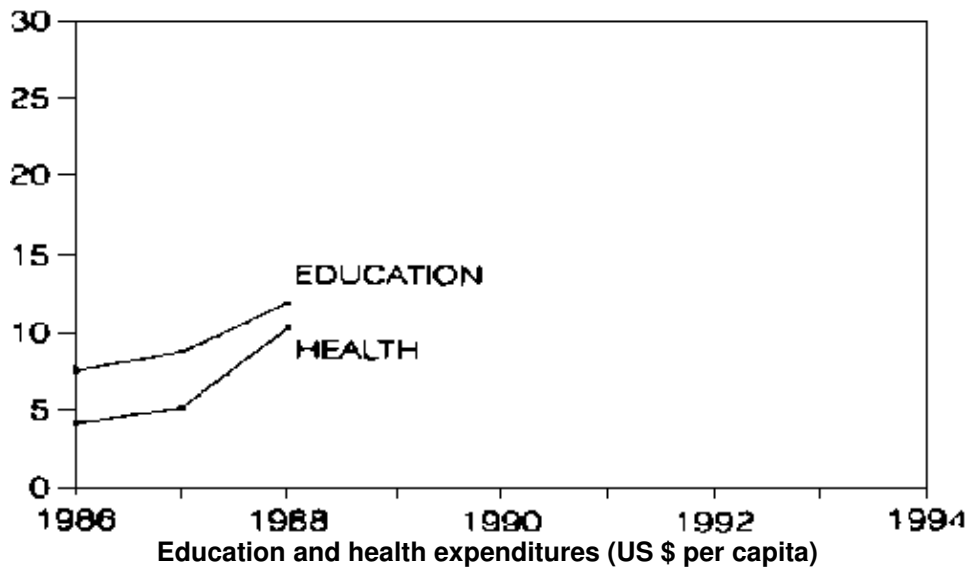


HEALTH





### PUBLIC EXPENDITURES



The infant mortality rate has increased from 100 in early 1980s to 114 in 1993. Major outbreaks of cholera every year from 1991 to 1993 were directly linked to the decline of sanitation and water supply facilities in urban areas. One positive development was that about four in five children were immunized against preventable diseases. Vaccinations against DPT and measles has increased and stood at 79% and 76% respectively in 1992.

Some 95% of primary school age children were enrolled in school in 1991, with 20% continuing into secondary education; 2% of the 20–24 age group are in further education. The figures disguise high drop-outs throughout the school system. The illiteracy rate was 27% in 1991.

A potentially important source of nutritional problems especially among newborns is the AIDS epidemic. Zambia is the fourth worst affected country in the world, after Uganda, Zaire and Tanzania. In Lusaka's largest hospital, the University Teaching Hospital, a recent survey indicated that 36% of the expectant mothers attending antenatal clinics tested HIV positive. Thus, pediatric AIDS would likely affect a good portion of the infant population.

### Notes

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2. Hunt, S., Kaite, C., Kasonde, T. & Campbell, E. (1994). Nutrition and Food Security. Analysis of the Zambia Priority Survey I. Food Studies Group, Oxford University.
3. Cogill, B. & Zaza, M. (1990). Report of the Pilot Nutrition Module. Report of a Survey of Rural Zambia Undertaken as Part of the Crop Forecasting Survey 1990. Central Statistical Office, National Food and Nutrition Commission and UNICEF/Zambia. Lusaka, November 1990.
4. DHS/University of Zambia and Central Statistical Office (1993). Demographic and Health Survey of 1992. Macro International, Columbia, MD.
5. Food Security, Nutrition & Health Monitoring System. Central Statistical Office, various reports.

## Chapter 3. The Nutrition Situation of Refugee and Displaced Populations

### Introduction

When people are displaced from their homes and sources of livelihood, especially in poor countries, they rapidly become extremely vulnerable to malnutrition, ill health, and dying. Indeed, not only are the refugee and displaced populations the most vulnerable to malnutrition in the world today, but they are beginning to form a substantial proportion of the total numbers malnourished. The situation today shows a quantum shift from that of only 20 years ago: numbers involved are at least an order of magnitude higher, and now increasing rapidly and seemingly inexorably. Before reporting on the nutrition of refugees and displaced populations, a brief description of the population itself is needed.

The world was very different 20 years ago when the institutions intended to help with forced migration were established. The cold war was at its height, and decolonization far from complete. Political pressure in Eastern Europe, and conflicts associated with decolonization, were two of the main causes of involuntary migration (Newland, 1993, p12). But under these circumstances, it was both clear when people became refugees – crossing well-defined boundaries – and the situation which they fled, while often oppressive, was not usually one of chaos and famine. There were generally 1–2 million refugees at any one time. Today, by far the most common cause of involuntary migration is war, often civil war, and cross-border refugees are often only one part of the overall displaced population – the others, often the majority, trying to survive as "internally displaced". Thus the distinction between refugee and internally displaced populations has become less clear, and in terms of nutrition they both face somewhat similar problems. Together, these populations now total more than 40 million worldwide.

In terms of the *severity* of the problems, there is also a discontinuity, not only in nutrition. Now the armed conflicts from which people are trying to escape can devastate whole economies and totally disrupt livelihoods of entire nations. They are leading to the highest rates of mortality measured in recent times, and generating famines.

The numbers of refugees reported by UNHCR is shown in Figure 1. This shows a remarkable take-off in numbers from around 1975, moreover this is not apparently related to any change in reporting or definition (UNHCR, pers comm). Data on refugees and internally displaced people for the Africa region alone show that over the past 24 years doubling time may have been as little as six years – a rate of increase of 12% per year (Payne, 1994). Recently in countries ranging from Ethiopia and Malawi to Pakistan and Iran, the refugee population rose by hundreds of thousands, or in the case of Iran, by millions. Although there is less certainty about the exact number of internally displaced in the world, it is certain that there are more internally displaced than refugees and that the trend in numbers has mirrored that of refugees.

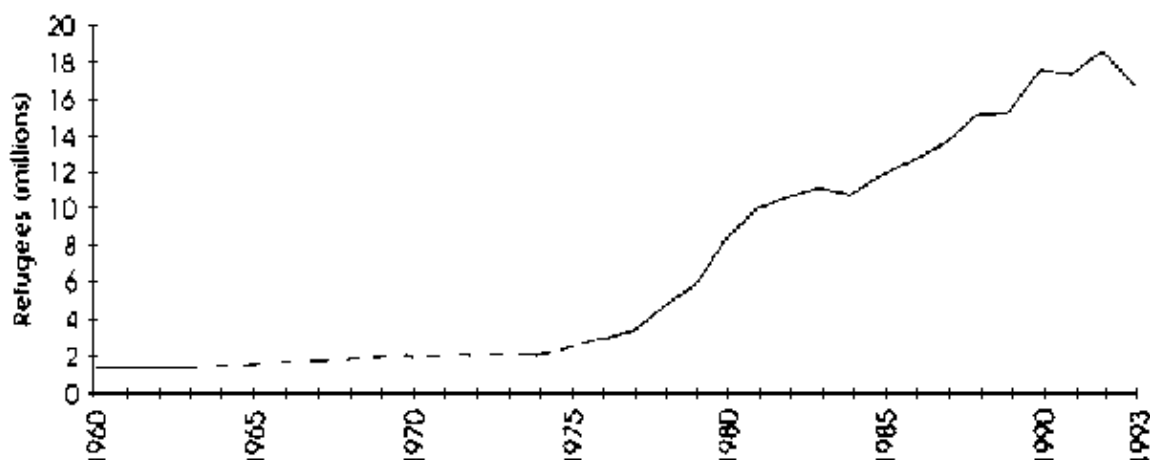


Figure 1. Trend in the Global Numbers of Refugees 1960–1993.

Sources: 1960–1992 Data – UNHCR (1993), 1993 Data – UNHCR (1994)

The ACC/SCN in 1992 focussed attention on the serious problem of malnutrition amongst refugee and displaced populations, in a statement endorsed by the ACC (the Executive Heads of all UN Agencies) (ACC/SCN, 1992), and proposed some specific actions. Among these was enhanced monitoring of the nutrition of refugees, and in early 1993, a consortium of UN, bilateral and non-governmental agencies (through the ACC/SCN's Group on Nutrition of Refugees and Displaced People) helped to launch a series of two-monthly reports, referred to as the Refugee Nutrition Information System. Through these reports the SCN aims to raise awareness of the problem, and in particular to provide regular information to those who can respond, in the UN system and in governmental and non-governmental organizations. Much of the data in this section derives from these reports<sup>1</sup> (ACC/SCN, 1993/4). A description of the indicators is included in each RNIS report, and reproduced in the box opposite.

<sup>1</sup> Funding support for RNIS reports is gratefully acknowledged from CIDA, NORAD, UNHCR, USAID (United States Agency for International Development, Bureau for Global Programs, Field Support and Research, Office of Health and Nutrition and the Bureau for Humanitarian Response under The Food Security and Nutrition Monitoring [IMPACT] Project, Contract No. DAN-5110-C-00-0013-00.), and WFP, as are inputs in kind from UNICEF and Save the Children Fund, UK. UNHCR kindly provided most of the maps used, some of which are reproduced here. Agencies contributing information to the RNIS reports include: AICF, Amar Appeal, Amnesty International, CAMA, CARE, CDC, CONCERN, UN/DHA, FAO, GOAL, Iraqi Civilian Aid, ICRC, IFRC, LSHTM, MSF–Belgium, MSF–CIS, MSF–France, MSF–Holland, MSF–Switzerland, OXFAM, SCF–UK, UNHCR, UNICEF, WFP, WHO, and WV.

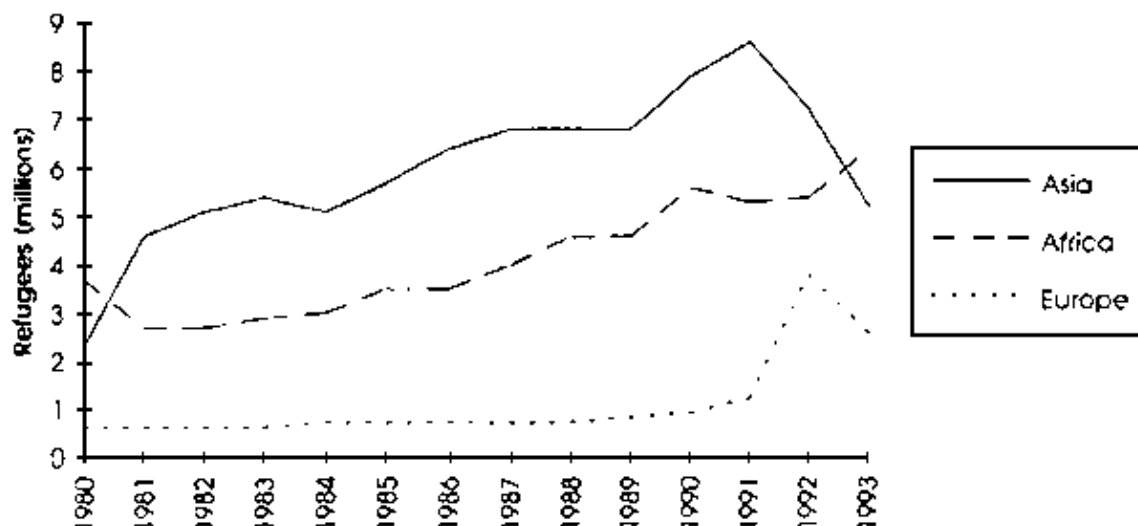
Estimates as of end-1993 are that there are 16.4 million refugees and at least a further 25 million internally displaced people in the world. Trends in numbers of refugees by region from 1980–1993 are given in Figure 2. As of end-1993, some 6.4 million were in Africa, 5.2 million in Asia, and 2.6 million in Europe<sup>2</sup>. Numbers in the other regions were much lower: 1–3 million in North America, 126,000 in Latin America, and 50,000 in Oceania. The fall in numbers from end-1992 to end-1993 globally (see Figure 1) and by region end-1991 to end-1993 (see Figure 2) is largely in Asia, mainly due to decreased numbers of Afghan refugees in Pakistan and Iran, and Iraqis in Iran.

<sup>2</sup> Data are available from relatively few sources. Generally, refugee statistics are taken from UNHCR (1993, 1994). Data on displaced populations are taken from Bread for the World (1992), US Committee for Refugees (1994), Newland (1993), MSF (1992, 1993). Additional sources are given in the text and under the figures. Data on Africa from mid-1993 onwards are taken from RNIS (ACC/SCN, 1993/4); the numerous sources given in these reports are

not generally repeated here.

This overall population of more than 40 million refugees and displaced people is equivalent to a medium-sized country, it would be among the largest in Africa – Ethiopia, the second largest, is around 55 million. Estimates of numbers of refugees and displaced people by region are given in Table 1.

This population has some of the highest rates of malnutrition and mortality ever seen. Only recently, mortality rates of 80 times normal were reported in Somalia (CDC, 1992), and wasting prevalences of more than 40% in Sudan, Angola and Liberia, for example. In the one month from 14 July to 14 August 1994, ten percent of the population that fled to Goma in E. Zaire died, some 50,000 deaths. Widespread outbreaks of micronutrient diseases such as scurvy, beri-beri, and pellagra have also regularly been reported amongst refugee populations over the past fifteen years.



**Figure 2.** Trends in Numbers of Refugees by Region (millions) 1980–1993 (December each year)

Note: Figure 2 does not include data for North America, Latin America, and Oceania, where there were recorded to be less than 1.5m refugees throughout the time period 1980–1993.

Sources: 1960–1992 Data – UNHCR (1993), 1993 Data – UNHCR (1994).

## Asia

As of end-1993 (UNHCR, 1994) over half the estimated 5.2 million refugees in Asia were Afghans in Pakistan (1.4 million) and in Iran (1.9 million) (see Table 1). There are reported to be 650,000 Iraqis in Iran. Other large groups are refugees from Myanmar in Bangladesh (200,000), Vietnamese in China (290,000), Sri Lankans in India (115,000), as well considerable numbers from Cambodia, Laos and Vietnam, in other countries.

No comprehensive data are available on the numbers of internally displaced populations in Asia. The numbers are certainly in the millions. Figures of 600,000 Afghans internally displaced are quoted (USCR, 1994, p91), and up to one million each in Iran and Myanmar (USCR, 1994, p42).

Nutrition information has not yet been systematically assembled for refugees in Asia, although recently reports on nutrition for four groups (Afghan refugees, Bhutanese in Nepal, from Myanmar in Bangladesh, and in or from Southern Iraq) have been compiled for the RNIS. Because of their numerical importance, information is first given here on Afghan refugees and displaced people, and on Iraq.

## Afghanistan

In the sixteen years since 1978, when civil war broke out following a coup d'etat, more than a million people were killed and over one third of the population, more than five million people, became refugees in Pakistan and Iran. The Soviet invasion in December 1979 escalated the internal war, but the withdrawal of Soviet troops in January 1989 only marked the transition from one set of conflicts to another. Although the Najibullah



regime lasted until early 1992, even after that success for the Mujahideen, civil war continued to rage. In different incidents in 1992 and 1993, thousands of people were killed by rocket attacks on the capital, Kabul. Now it is estimated that added to the millions of refugees (some of whom were repatriating before 1992) there are over half a million people internally displaced in and around Kabul itself (MSF, 1993; USCR, 1994, p.91).

## INDICATORS

**Wasting** is defined as less than  $-2SDs$ , or sometimes 80%, wt/ht by NCHS standards, usually in children of 6–59 months. For guidance in interpretation, prevalences of around 5–10% are usual in African populations in non-drought periods. We have taken more than 20% prevalence of wasting as undoubtedly high and indicating a serious situation; more than 40% is a severe crisis. **Severe** wasting can be defined as below  $-3SDs$  (or about 70%). Any significant prevalence of severe wasting is unusual and indicates heightened risk. (When "wasting" and "severe wasting" are reported in the text, wasting includes severe – e.g. total percent less than  $-2SDs$ , *not* percent between  $-2SDs$  and  $-3SDs$ .) Evidence from refugee camps shows elevated levels of wasting to be associated high mortality rates (CDC, 1992). Equivalent cut-offs to  $-2SDs$  and  $-3SDs$  of wt/ht for arm circumference are about 12.0 to 12.5 cms, and 11.0 to 11.5 cms, depending on age.

**Oedema** is the key clinical sign of kwashiorkor, a severe form of protein–energy malnutrition, carrying a very high mortality risk in young children. It should be diagnosed as *pitting* oedema, usually on the upper surface of the foot. Where oedema is noted in the text, it means kwashiorkor.

**A crude mortality rate** in a normal population in a developed or developing country is around 10/1,000/year which is equivalent to 0.27/10,000/day (or 8/10,000/month). Mortality rates are given here as "times normal", i.e. as multiple of 0.27/10,000/day. [CDC has proposed that above 1/10,000/day is a very serious situation and above 2/10,000/day is an emergency out of control.] Under-five mortality rates (U5MR) are increasingly reported. The average U5MR for Sub-Saharan Africa is 181/1,000 live births (in 1992, see UNICEF, 1994), equivalent to 1.0/10,000 children/day.

**Food distributed** is usually estimated as dietary energy made available, as an average figure in kcals/person/day. This divides the total food energy distributed by population irrespective of age/gender (kcals being derived from known composition of foods); note that this population estimate is often very uncertain. The adequacy of this average figure can be roughly assessed by comparison with the calculated average requirement for the population (although this ignores maldistribution), itself determined by four parameters: demographic composition, activity level to be supported, body weights of the population, and environmental temperature; an allowance for regaining body weight lost by prior malnutrition is sometimes included. Formulae and software given by James and Schofield (1990) allow calculation by these parameters, and results (Schofield and Mason, 1994) provide some guidance for interpreting adequacy of rations reported here. For a healthy population with a demographic composition typical of Africa, under normal nutritional conditions, and environmental temperature of 20°C, the average requirement is estimated as 1,900–2,000 kcals/person/day for light activity (1.55 BMR).

**Indicators and cut-offs indicating serious problems** are levels of wasting above 20%, crude mortality rates in excess of 1/10,000/day (about four times normal – especially if still rising), and/or significant levels of micronutrient deficiency disease. Food rations significantly less than the average requirements as described above for a population wholly dependent on food aid would also indicate an emergency.

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Schofield C. and Mason J. (1994) *Evaluating Energy Adequacy of Rations Provided to Refugees and Displaced Persons*, Paper prepared for Workshop on the Improvement of the Nutrition of Refugees and Displaced People in Africa, Machakos, Kenya, 5–7 December 1994 ACC/SCN, Geneva.

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**Table 1.** Numbers of Refugees and Displaced People by Region – End 1993

<i>Region</i>	<i>Refugees</i>	<i>Displaced</i>
Asia	5.2m	N.A.
of which Afghans in Iran	1.9m	
Afghans in Pakistan	1.5m	
Africa <sup>1</sup>	6.4m	10.1m
Latin America	0.1m	1.7m <sup>2</sup>
Europe	2.6m	3.4m
North America	1.3m	N.A.
Oceania	0.1m	N.A.
Former USSR <sup>3</sup>	0.6m	1.6m
Total	16.3m	N.A. but >25m

Source: UNHCR (1994), table 1 except where noted.

1. RNIS No.3, Jan 1994, total = 16.5m; 6.4m is UNHCR figure for refugees; 10.1m displaced calculated by subtraction; UNHCR figure includes 0.23m in N.Africa, mainly Algeria.

2. From USCR (1994).

3. Note this included with Europe in Fig.1.

In terms of health and nutrition, the destruction of infrastructure, including schools, health facilities, and water supplies, must mean that malnutrition and disease are rampant. It was said in 1993 that "Kabul today is in the situation that Mogadishu was in 1991: with only a handful of relief organizations remaining to tell the tale..." (MSF, 1993, p31). Kabul has been under blockade recently, limiting food supplies and causing soaring prices. Together with the destitution of much of the population, this must be rapidly leading to widespread malnutrition.

Not much quantitative information is currently available about nutrition of the displaced population in Afghanistan. Surveys earlier this year around Kabul showed high levels of wasting (about 32%), an apparent deterioration when compared with surveys in 1990. Many displaced have fled towards Jalalabad, nearer the Pakistan border, where there are a number of camps and many relief agencies helping. Here such nutritional data as there are indicate limited food supplies, and somewhat elevated levels of wasting (around 15–20%), likely to be several percent higher than under normal circumstances in Asia.

There are about 1.4 million Afghan refugees still in Pakistan, down from 1.6 million in 1993. Repatriation has slowed almost to a standstill, and is not expected to increase until the situation within Afghanistan improves. Such information as there is indicates relatively good nutrition amongst the population in camps. In Iran much of the refugee population has been living among the local population, and although there is little information on their nutrition, it is assumed to be reasonable and similar to the local population itself.

In the 1980s, the Afghan refugees and displaced population were numerically the largest anywhere, and although the numbers have decreased due to some repatriation in the early 1990s, the situation remains amongst the worst in the world. Undoubtedly major improvement awaits a political solution. As Médecins Sans Frontières has said: "Today's chaos stems from a combination of ten years of war, ethnic strife, a surfeit of weapons, the inability of Mujahideen fighters to return to civilian life, drugs and arm trafficking, and above all, the direct intervention of the regional powers. Peace in Afghanistan depends less on increased international involvement than on the complete withdrawal of the regional powers" (MSF, 1993, p31). And for sure improved health and nutrition depend primarily on peace. Nonetheless, extraordinary efforts by external agencies have helped to alleviate the suffering, and continued support for these remains important. Where the internally displaced population is accessible such as in Jalalabad at the present time, improved water supplies, adequate provision of food and medicine, and health care, can help to improve and maintain nutrition.

## Iraq

Well over one million refugees from Iraq were reported in Iran, as of end-1992, decreasing to 645,000 by end-1993 (UNHCR, 1994, p16). Moreover, there is a substantial displaced population of Kurds from Northern Iraq, both internal and in neighbouring countries. In Northern Iraq, in the Kurdish region, it is estimated that perhaps one quarter of the population of nearly four million has inadequate housing, and that some 400,000 are displaced from government-controlled areas (USCR, 1994, p104-105). At the end of 1993, WFP was providing rations for 750,000 people in the North. However, the situation of the local population in the marshlands of South Iraq has attracted particular attention in terms of destitution and malnutrition, and is described in more detail below.

### *Southern Iraq*

The population in the marshlands of Southern Iraq has suffered massive destruction of livelihood, and many of those who could escape have become refugees in Iran. Reports on the situation are fragmented, and certainly no direct surveys are available from within Iraq. Nonetheless, the situation can be pieced together from available reports, from the UN Commission on Human Rights (UN, 1993a, 1994), the US Committee on Refugees (1994), the AMAR Appeal (1992/4), and several others. When new information on nutrition has been available, reports have been included in the RNIS. The following summary is constructed from the different available sources.

The Marsh Arabs or Maadan have been long viewed with hostility by the Iraqi Government – according to the USCR (1994, p105) – and in 1989 plans were made for "economic blockade, population removal, and other measures". In early 1991 civil war broke out following the Shi'ite revolt after the Gulf War, leading to major population displacement into the marshlands between the Tigris and Euphrates rivers. Following this, there was an intensified military campaign and blockade, after August 1992 involving ground forces only, when the western countries declared a no-fly zone in the area. This involved widespread burning and shelling of villages, and forced removal of Shi'ites in and around the marshes. Extensive army and civil engineering projects began to divert water from the marshes. The shrinking of the marshes deprived the population of its livelihood and food, as well as cover, and undoubtedly caused widespread malnutrition. The campaign continued during 1993, with extensive civilian casualties. Satellite imagery showed that indeed large areas of the marshlands were drying up. (USCR, 1994, p105).

During this time, many reports of severe food shortages reached the UN. For example, in February 1993 an ECOSOC report (UN, 1993b) stated that "the inhabitants remaining in the marshes are apparently no longer able to feed themselves as the environmental destruction taking place removes local food sources and they are not able to purchase food due to the blockade...". The AMAR Appeal also reported, in February 1993, that food (rice, wheat, oil, and beans) was unavailable in the marshes due to a blockade. Clean drinking water was reportedly unavailable, and people were forced to drink polluted water (AMAR Medical Committee, 1993). All the available reports pointed to a very serious nutritional situation for many of the people within the marshland area, for example "in terms of needs, reports and testimonies indicate that malnutrition and disease are widespread within the marsh area... coupled with inadequate food, the effects of disease have been severe, particularly for infants, lactating mothers and the elderly" (UN, 1993). Access to food and health care in the marshland area was prevented, accelerating the displacement. By the end of 1994 the "evidence (was) that the marshes have largely dried up." (Special Rapporteur statement to UN, 25 November 1994). Refugees interviewed in Iraq stated the main reason for their flight had been the drying of the marshes. The Special Rapporteur of the UN Commission on Human Rights concluded that the situation for the Marsh Arabs "has deteriorated further" (UN, 1994, para 43)

Most of the information on the situation within Southern Iraq comes from reports by refugees in South West Iran. The exact number of people affected is unknown, but earlier reports were that the original population of the region was of the order of half a million people. In mid-1994 it was reported that as many as 200,000 had fled their homes and were in hiding in the marshes; the fate of the others is not known, except that up to 50,000 people perhaps were living in camps in Iran.

Many of the reports available on nutrition refer to the refugees as they crossed the dangerous border into Iran. This population (estimated 3,700 in November) would take temporary refuge on a road spanning the marshes between Iran and Iraq, their first contact with any assistance. Here the health and nutrition conditions were reported to be very bad – for example in August 1993 80% of those seen had amoebic dysentery. Reports usually talk of severe malnutrition, with an appalling variety of suffering from disease and physical conditions

– from cold weather and no shelter on firm ground, to women and children trapped in mud too hot to walk in.

While many civil conflicts devastate the economy and destroy livelihoods, in this instance the destruction especially affects the food chain, and lack of food and potable water are among the major reasons for displacement.

### **Bhutanese Refugees in Nepal**

Late in 1990, people of Nepalese origin in Bhutan (some of whom had been in Bhutan for many generations) began fleeing to Nepal via India. In June 1994 the population had stabilized at 86,000 in eight different sites. The Nepalese Government has made several attempts to negotiate the refugees' return to Bhutan, but with little success. When the influx began, the refugees were able to enter freely, although the facilities were crowded and with poor sanitation. As numbers increased, friction with the local population became an intensifying problem, but nonetheless the Nepalese Government has remained host to the population. Attempts were made to begin screening new arrivals, in collaboration with UNHCR.

The general food distributions have been regular, and have contributed to very low levels of wasting among the refugee population. On the other hand, in part because of complete dependence upon a general ration with limited variety, there has been repeated reports of widespread outbreaks of micronutrient deficiency diseases. These have been definitively confirmed by multi-donor missions. Thus scurvy (vitamin C deficiency), beri-beri (thiamine deficiency), pellagra (niacin deficiency), and angular stomatitis (an indicator of B vitamin deficiency, notably riboflavin), and goitre (iodine deficiency) have been reported. A total of over 12,000 cases of beri-beri were identified. Recently however the food basket has been adjusted to include whole rice, vegetables, and a fortified blended food, estimated to give adequate intake of micronutrients with the possible exception of iron and vitamin B12. The beri-beri outbreak reached a peak in November 1993, while other deficiencies were reported throughout the first half of 1994, incidence rates were of the order of 0.5 to 0.7 per 1,000 per day for pellagra and scurvy. More recently the incidence rates have fallen, although cases are still being seen.

The situation amongst the Bhutanese refugees in Nepal has drawn considerable attention, as a clear case of micronutrient deficiencies, although the mortality rates and level of wasting have been generally similar, or even lower than, the local community. Micronutrient deficiencies were related to a restricted general ration, which although adequate in energy, did not provide a complete diet.

### **Myanmar (Rohingya) Refugees in Bangladesh**

Towards the end of 1991, people of the Rohingya Muslim minority in Myanmar's Rakhine state began arriving in South East Bangladesh. By June 1992 the refugee population had reached 250,000, distributed between 15 camps in Cox's Bazaar District, which is a disaster prone area with regular flooding and occasional cyclones.

Within a short period of time data indicated that the population were experiencing a nutritional and health crisis as crude mortality rates as high as 2.1/10,000/day (7 x normal) were being recorded. Nutritional survey data from early 1992 established wasting levels as high as 27% with 9% severe wasting. Surveys also showed high levels of night blindness and angular stomatitis. By early 1994 the total refugee population had decreased somewhat to 200,000, mainly due to repatriation, some of disputed voluntariness. At that time, the health and nutritional status of the population had improved considerably and was comparable to the local host community. However, angular stomatitis was still being seen so that a decision was taken to add fortified DSM to the supplementary feeding programme ration. Nonetheless, most recent reports (June 1994) indicate that riboflavine deficiency is still a problem.

The number of refugees from Rakhine state in Bangladesh decreased to just over 190,000 at the end of July 1994. Large scale repatriation is now under way because of the "positive environment for repatriation on both sides of the border". The crude mortality rate for the month of July was estimated as 0.26/10,000/day, and the under five mortality rate as 0.45/10,000/day. Both rates are considered within normal limits. The situation was therefore brought under control in terms of nutrition and health, with adequate food supplies and access to health care when provided in the camps.

## Sub-Saharan Africa

As of mid-1994, an estimated 18.5 million people were refugees or displaced in Sub-Saharan Africa, as a result of at twelve or more different situations. Although the distinction between refugee and displaced populations is increasingly doubtful, roughly six million of these have been defined as cross border refugees.

Since the numbers of refugee and displaced people can vary quite rapidly, one means of assessing the magnitude of the situation is to calculate the number of person-months or years of those affected – that is for example, if a million people are affected for two months, this would be counted as two million person-months. The numbers affected in these terms are given for the period October 1993 through September 1994 in Table 2, for the nine most extensive situations, which account for more than 90% of those affected. This also gives an average number per situation over one year. Figures are calculated from the data given in the RNIS reports, #s 2 through 7. Details of these nine situations are given in the sections that follow.

The nine most extensive situations in Table 2 all result from internal conflict in the country itself or in neighbouring countries. (The Sudanese situation is often regarded as two separate ones, distinguishing the South from Eastern, Central and Southern Sudan). The five worst situations – Sudan, Angola, Liberia, Rwanda/Burundi, and Mozambique – all involve around two to four million people affected, averaged throughout the year. Given that the mortality amongst the worst affected populations is often five to ten times normal, this may well represent an excess mortality of 100,000 to 200,000 people in each of these situations. Applying such a figure to all nine situations, there may be more than a million additional deaths per year.

**Table 2.** Refugee and Displaced Populations in Sub-Saharan Africa (Person-Years, Oct 93 – Sept 94)

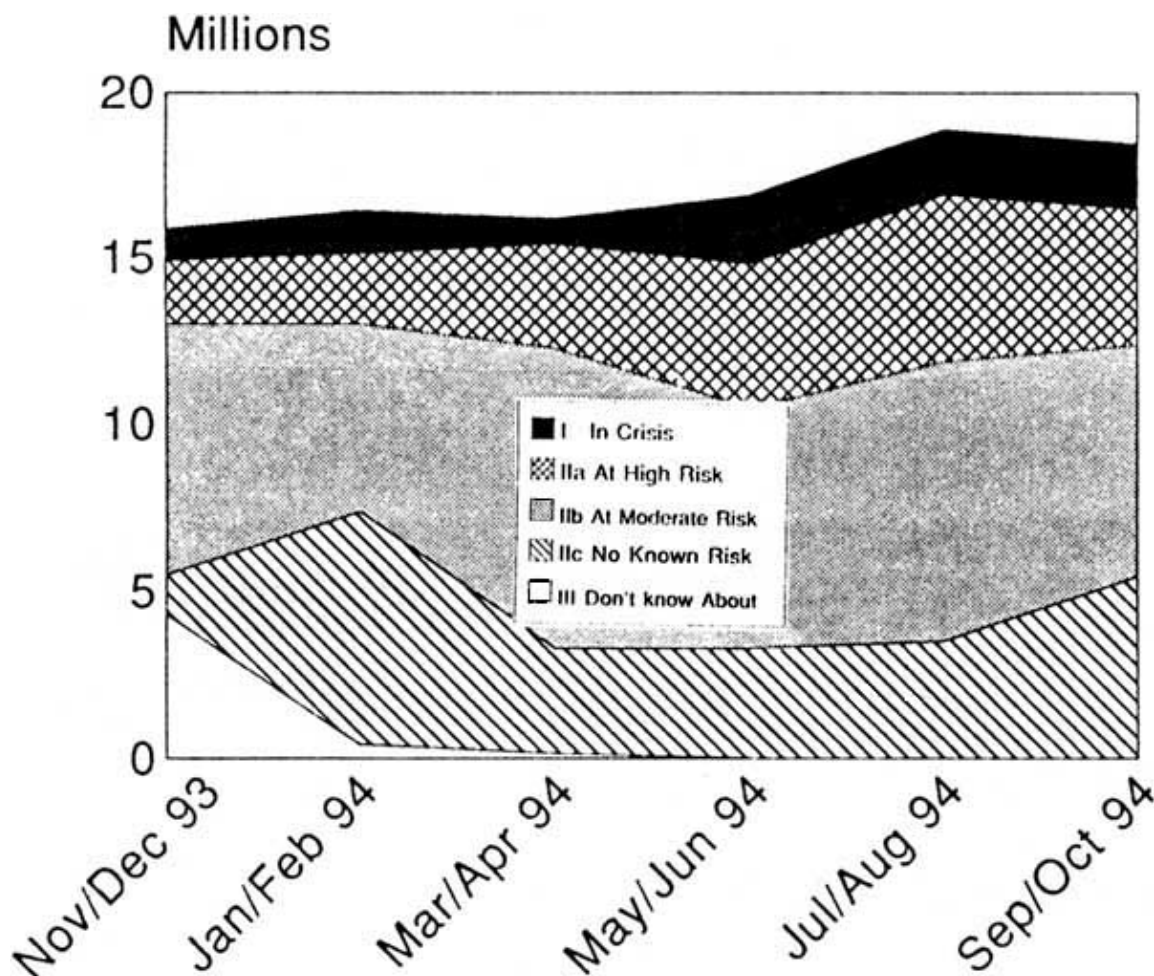
<i>Country</i>		<i>Person-Years</i>	<i>Person-Years at High Risk</i>	<i>Comments</i>
Sudan:	Southern	1,828,000	489,000	Displaced and refugees in Uganda, Zaire, Ethiopia and Kenya
	East, Central, West	1,824,000	17,000	Displaced and refugees from Ethiopia
Rwanda/Burundi		3,239,000	2,276,000	Regional situation incl. Zaire, Tanzania and Uganda
Angola		2,994,000	501,000	Displaced and refugees in Zaire and Zambia
Liberia Region		2,827,000	589,000	Regional situation incl. Sierra Leone, Côte d'Ivoire, and Guinea
Mozambique Region		1,938,000	0	Including displaced, returnees and refugees in Malawi, S. Africa, Zimbabwe and Tanzania
Somalia		728,000	23,000	Displaced and refugees in Kenya and Ethiopia
Shaba, Zaire		448,000	126,000	Displaced
Ethiopia		300,000	47,000	Displaced, returnees and refugees from Somalia and Sudan
Kenya Refugees		300,000	0	Refugees mainly from Somalia, Sudan, and Ethiopia
<b>Total</b>		<b>13,187,000</b>	<b>4,068,000</b>	

Source: Calculated from ACC/SCN (1993/4) RNIS Reports.

Estimates can also be made of the average numbers of people (or people–years) at high risk of malnutrition. These are the groups defined as those reported with high prevalences of malnutrition and sharply elevated mortality, plus those considered to be at high risk, shown in the second column of numbers in Table 2. In Sudan, Angola, and Liberia, an average of half a million people in each situation were at high risk during the period October 1993 to September 1994. The Rwanda/Burundi situation involved over five million people in August through October 1994. The excess mortality in this situation was the highest ever reported, as is discussed in the section on Rwanda/Burundi below. On the other hand conditions in Mozambique have been well controlled in recent years, and repatriation is progressing without reports of widespread malnutrition.

The evolution of the situation from November/December 1993 and September/October 1994 is illustrated in Figure 3. Here, the total numbers reported by category of risk throughout Sub-Saharan Africa are shown. Those in a critical situation of high malnutrition and elevated mortality are in the top section; for many purposes these are added to those defined as at high risk (second band, category IIa), for example in the data in Table 2. Although situations can arise rapidly, for example in Rwanda, and can also improve quite rapidly such as in Somalia, overall a fairly steady long-term trend of increasing numbers can be seen, and indeed the proportion of those at high risk is if anything rising.

The characteristics of almost all the situations involving refugees and displacement are that they result from civil wars, occasionally compounded by drought. These wars tend to be protracted, and to devastate the economies of the countries involved. Large proportions of the population get displaced, in conditions of chaos and vicious violence. In most cases this rapidly leads to malnutrition and ill health, in particular when populations congregate in towns or camps. For those inside the countries while the conflict continues, any widespread relief and improvement in conditions depends largely on political and military settlement. This has been demonstrated in Mozambique and Somalia recently. Required responses are clearly very different for the populations trapped inside areas of conflict compared with those that manage to reach situations with access to outside relief, usually by crossing borders.



**Figure 3.** Trends in Total Refugee/Displaced Populations in Africa by Risk Categories, December 1993 – October 1994.

Source: ACC/SCN (1993/4) RNIS Reports.

For those inside areas of conflict, some effective relief is still possible and is undoubtedly far better than nothing. Thus even when situations have not been turned around, there is little doubt that the efforts made by international organizations, United Nations and nongovernmental – often involving very substantial risks – have had an effect. Relief supplied in situations such as Liberia, Sudan, and Angola (the latter under conditions of siege) have mitigated the starvation, destitution, and epidemics of disease.

In intermediate situations, such as in Shaba, Zaire, where the displaced population is not rendered inaccessible by conflict, organizational and financial constraints have hampered effective relief by outside agencies. This is one particular type of situation where intensified efforts by external organizations might be possible and effective.

The more extensive opportunity for greater impact is in the populations, usually refugees, who have fled to locations where they are accessible to outside relief. Under these circumstances there is frequently an initial period of severe crisis– Rwandan refugees in Zaire and Tanzania recently are a vivid example – when there is clearly potential for more rapid reduction in mortality, malnutrition, and disease. But beyond that, under many circumstances malnutrition and excess mortality persist for many months after the initial crisis (Toole and Waldman, 1990). It is here that more effective application of available resources through better organization, building on previous experience, as well as increased resource availabilities, could have a major impact in reducing suffering.

The refugee and displaced population situations in Africa, as they are today, are described briefly in the next sections. This is in part to provide a baseline for future monitoring and to raise awareness, but also to indicate opportunities for more effective intervention. The recent data are drawn from those reported in the RNIS, and earlier background mainly from the documents cited in the footnote on page 58.

## **Sudan**

"The people of Sudan are suffering one of the gravest and most enduring human crises in the world. Since the outbreak of the civil war in 1983, writers have run out of adjectives to describe the calamities that have engulfed the country." (MSF, 1993, p17). The population of Southern Sudan is estimated to have dropped by 30% to 3.5 million people in the past ten years due to death and displacement (USCR, 1994, p69). A staggering 80% of the population in Southern Sudan are estimated to have been forced from their homes at least once since 1983. According to UNHCR (1993, p56), 600,000 people are thought to have died so far, most from malnutrition and diseases.

The civil war in the south has continued through 1994 with huge numbers of people displaced and killed. For example, an estimated additional one million people were forced out of their homes in 1992, and in 1993 indiscriminate bombing of settlements and relief camps in the south took place through the year, "killing numerous displaced persons and causing thousands of terrified civilians to flee" (USCR, 1994, p69).

"The picture is further complicated by the fact that the war is not confined to the south. Since the beginning of the conflict, millions of Southerners have fled to the north, mainly to the outskirts of Khartoum. Here they have been living in appalling conditions, some of them literally on rubbish tips". (MSF, 1993, p23). This has led to forced relocation of hundreds of thousands, temporarily halted when in 1993 the bulldozers demolishing the settlements could no longer operate for lack of fuel. (This situation has been described by the UN Special Rapporteur on Human Rights for Sudan (UN, 1994b)).

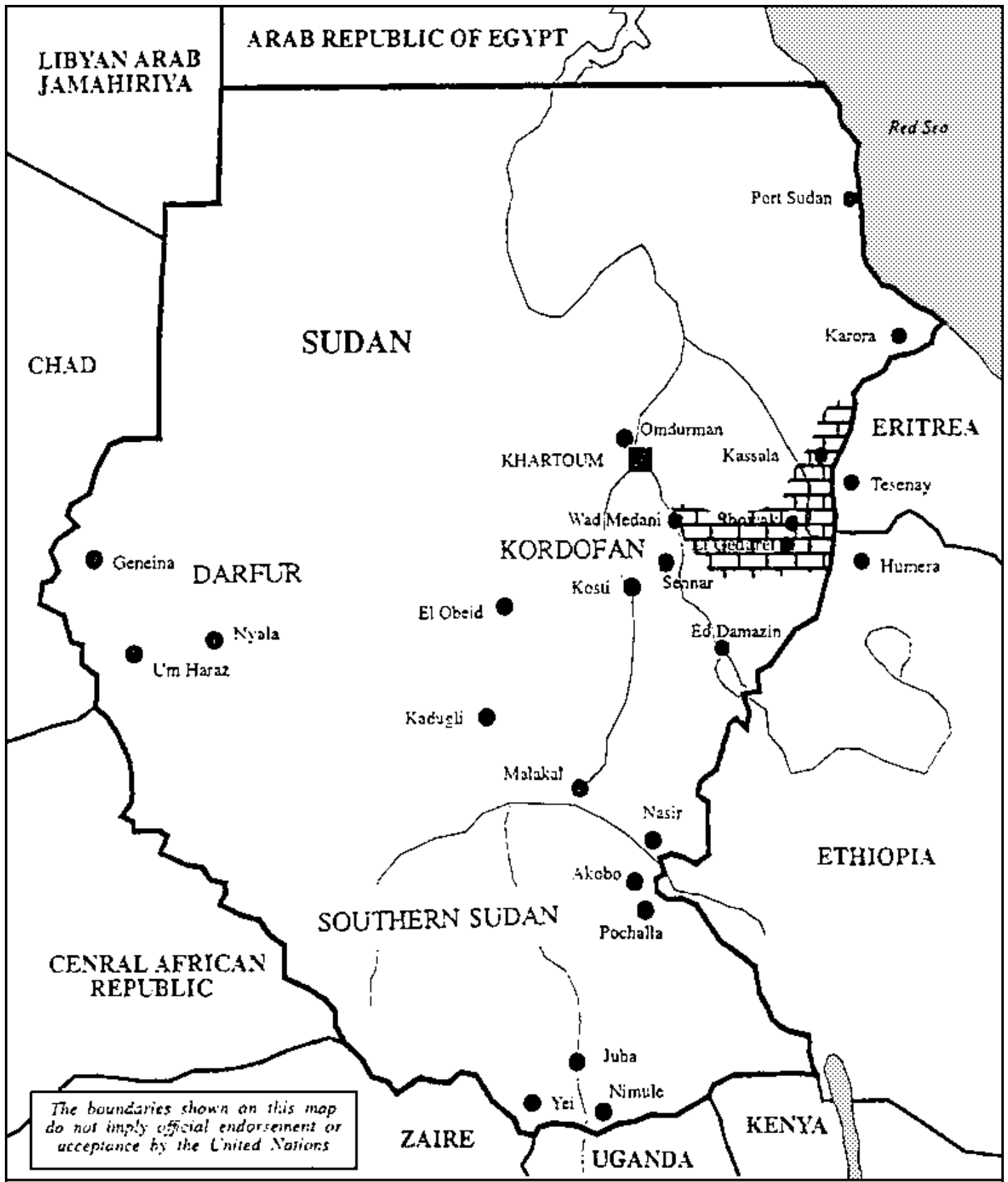
Since the mid–1980s, continuing conflict in the Nuba mountains has affected perhaps one million people. Among the effects has been much reduced access to basic healthcare, education, and sometimes food (UN 1993c).

The war thus has not only displaced much of the population in the south, but many of these have fled northwards towards Khartoum, where they form a population estimated at nearly two million of displaced and homeless. Added to this, recurrent droughts in the vast areas to the west and south west of Khartoum, notably Darfur and Kordofan, have destituted the population and caused large scale migration. As a result, there are more displaced and refugees among the Sudanese population than anywhere else in Africa. From the view point of providing assistance, they tend to fall into at least two groups – those in the south, where the major problem is reaching the internally displaced, while the refugees that reach neighbouring countries are more accessible; and those around Khartoum and elsewhere in the eastern, central and western parts of the country, for whom assistance needs to come in through Khartoum. These two situations are described

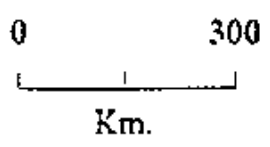
separately below. Trends in total numbers and those at high risk are shown in Figure 4.



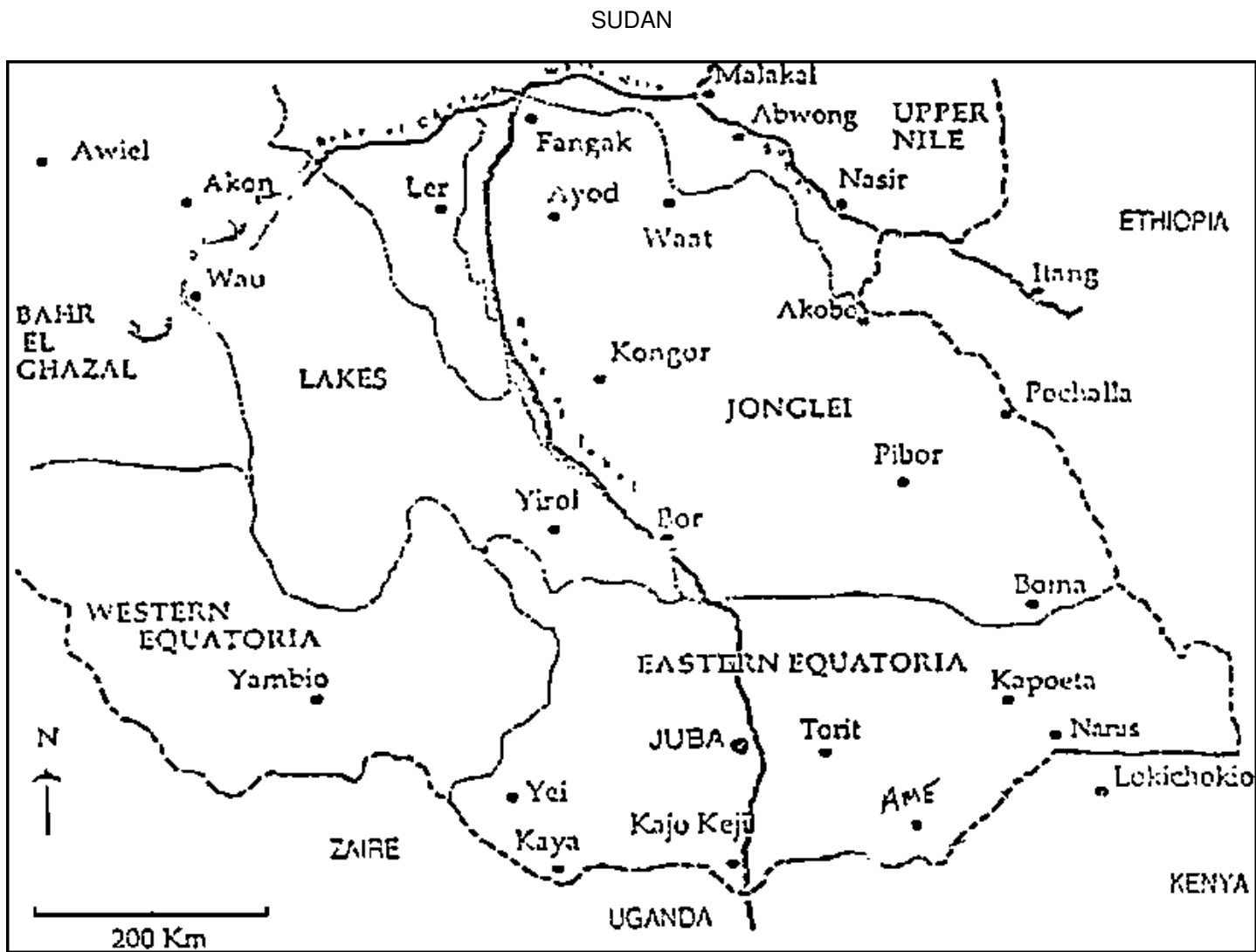




*The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations*



- Capital
- Town or village
- ▨ Refugee area (Eastern Sudan)



Southern Sudan

*Southern Sudan*

The disruption to agricultural production and breakdown of basic infrastructure due to the war have, in conjunction with successive droughts during the last ten years, given rise to localized famine conditions in many parts of the South. The war has created large refugee populations in Uganda and Northern Kenya with a steady flow of new arrivals in Ugandan camps throughout 1993 and 1994. The Southern Sudanese population in Uganda increased from 150,000 in December 1993 to 270,000 in October 1994. The internally displaced population in Southern Sudan as of October 1994 was estimated as 2,000,000, all considered at moderate risk (RNIS #7, Table 1). This was an improvement from earlier in the year, due to greater success in delivery of food aid, by air, barge, and road. Trends in the numbers of displaced people in Southern Sudan, with estimates of their risk, are shown in Figure 4.

The provision of food aid and other relief resources to the war and drought affected in Southern Sudan through programmes such as Operation Lifeline Sudan (OLS) – which transported food from Kenya and Uganda – has saved many lives. But periodic escalations in violence and resulting displacement of large population groups continuously place large numbers of people at risk. In recent years food and relief resources have been provided through air-drop operations to inaccessible areas as well as by river cargo and road transport. However, sudden changes in security, damaged infrastructure due to fighting and bad weather, and lack of donor food aid pledges and funds for transport costs have all constrained the relief programmes. Many needy populations have therefore been cut off from food aid for long periods and as a consequence have often had extremely high levels of wasting and mortality. In mid-1994 the government authorized deliveries along the Bor-Juba route, for nearly half a million people, which brought substantial temporary relief; but the future remains totally uncertain.

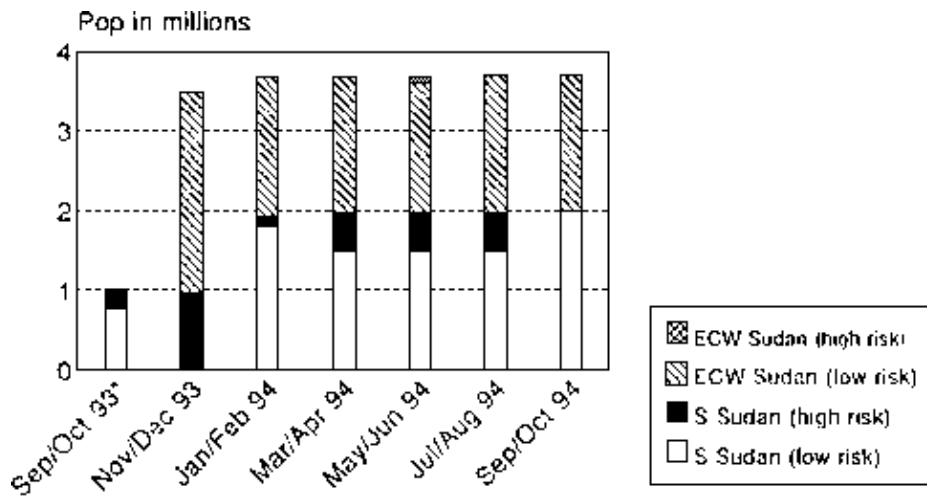


Figure 4. Sudan

\* Note: For Sep/Oct no information was available for EWC Sudan. The change from Sep/Oct to Nov/Dec, therefore, reflects more complete information, not a change in the situation

In March 1993, surveys in Ame, Ayod, Akon and Kongor found prevalences of wasting of 75–84% with 40–44% severe wasting. These are among the highest figures ever recorded. In May 1993 41% rates of wasting were recorded in Kotobi. In September 1993 the prevalence of wasting among children in Bor was found to be 45%. Measles epidemics were reported in the displaced persons camps of Ame Atepi and Ashwe in September 1993. A survey in Chotbura in Upper Nile province in January 1994 found 24% levels of wasting, while in Obel–2 displaced camp 30% prevalence of wasting was recorded in February. In March 1994 a nutrition survey in Waat town in Jonglei found prevalence of wasting of 25% and crude mortality rates of 4.4/10,000/day (20 x normal). In April 1994 wasting rates of 34% were recorded in Labone camp in Equatoria province and in the same month rates of 45% were found in Alek county in Northern Bahr El Ghazal. Although follow-up surveys amongst many of these populations showed improvement – probably in part because these groups were given immediate priority for food aid deliveries – these periodic high levels of wasting give some indication of the degree of vulnerability and malnutrition amongst the people of Southern Sudan.

In sum, between October 1993 and June 1994 the numbers in Southern Sudan known to have high prevalences of wasting and/or sharply elevated mortality or to be at high risk of malnutrition varied between 230,000 and one million. This variation reflected the changing security situation and the capacity of international relief agencies to deliver emergency aid. Major impediments to delivery of relief foods have been shortfalls in cereal donations and lack of financial resources for transport. In January 1994 donor shortfalls in supply meant that less than 50% of food requirements for Southern Sudan were met, while between April and June 1994 lack of funding seriously curtailed air operations from Lokichokio (in Kenya) and from Entebbe to Juba.

#### *Eastern Central, and Western Sudan*

The number of displaced Sudanese in East, Central and Western Sudan is around 1.7 million, estimated in mid-1994. This population is mainly displaced Southerners, many of whom are in camps around Khartoum and other large urban centres. There are also large numbers of Sudanese displaced from their farming areas due to a succession of droughts and increasing environmental hazards in the areas across the centre of the country, and from the north. Efforts have been made to forcibly relocate the displaced population from around Khartoum for several years. It was reported that in 1992 to 1993 as many as 700,000 people were moved some distance away from the city. In these areas no housing or services were provided, and for much of the time international agencies were unable to gain access to this population. It is therefore considered very likely that malnutrition and ill health were extensive in this population (USCR, 1994, p40; MSF, 1993, p23). In mid-1994, the population in these camps around Khartoum was estimated to be as high as one million people, with levels of wasting in young children estimated at around 20%. In past years prevalences of wasting have periodically been at crisis levels, in part relating to seasonal grain price increases. Recent reports from UNICEF indicate the need for more intensive feeding facilities in camps and greater supplies of foods for malnourished children and key medicines such as antimalarials and antibiotics.

Populations affected by drought in Darfur and Kordofan have also needed substantial relief. Acute food shortages and rapidly rising food prices were reported in Darfur, affecting around 70,000 people in mid-1994. Food aid was distributed to approximately half a million people affected by drought in north Kordofan in March 1994, but since then there have been insufficient stocks, and government reports have indicated that up to 100,000 people may have faced starvation in mid-1994.

In parts of N. Darfur and Kordofan, environmental degradation caused by years of droughts and deforestation have increasingly marginalized large numbers of agro-pastoralists. Year-round levels of wasting in children above 25% are often seen (Young and Jaspers, 1992).

Surveys were carried out during 1993 in parts of Eastern Sudan among mainly Ethiopian refugees, showing moderately elevated levels of wasting of around 10%. Additional surveys in August 1994 found around 15 to 20% wasting, somewhat higher than in the previous year. The refugees in this area have some self-sufficiency, and some of the camps have satisfactory nutritional status.

Overall, nearly two million people are internally displaced in the central areas of Sudan. Those displaced by the war in the South are at particular hazard, in part because of relocation programmes and difficulty of access to external assistance. In addition, many people affected by recurrent drought throughout the country are logistically difficult to reach, although their situation could improve with better local harvests. Nonetheless, the mixture of ethnic conflict and environmental hazard leaves no end in sight to this situation, one of the "gravest and most enduring human crises in the world".

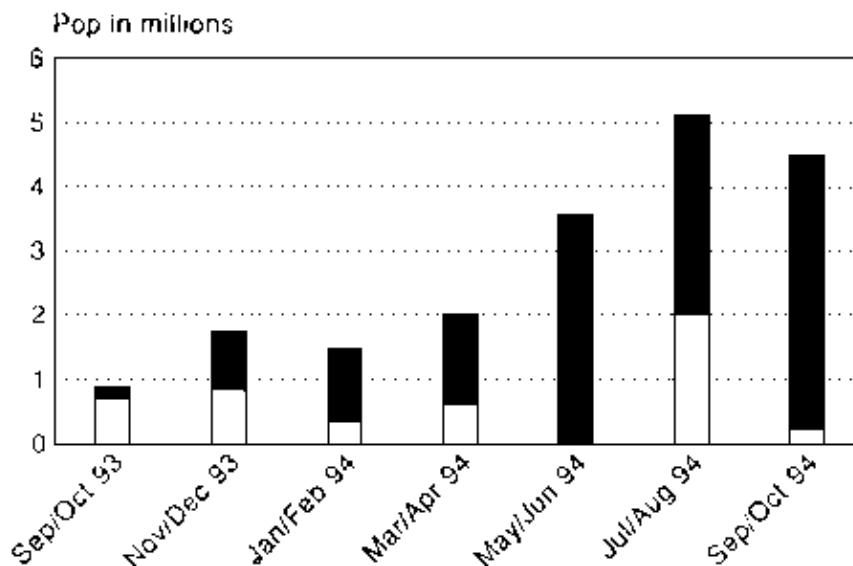
#### **Rwanda/Burundi**

The long-running civil conflict in *Rwanda* between the Tutsi-dominated FPR and Hutu-led government had produced a situation at the end of 1992 where there were 250-350,000 displaced people in camps in the FPR controlled Northern area of the country. Insufficient donor contributions, limited local market capacity and logistical problems exacerbated by insecurity had determined that ration levels for this dependent population had been grossly inadequate for many months. As a result prevalence of wasting had passed 10% in many camps and, for example, mortality rates were found to be six to eight times normal between September and December 1992 in two camps.

Escalation in fighting in 1993 led to further population movements so that by October 1993 there were 350,000 displaced people in camps north of Kigali in government held areas, while approximately 300,000 people who were displaced further south in February 1993 had returned to their land in the demilitarized zone. Throughout 1993 the emergency food rations distributed to the 350,000 camp population varied enormously with long periods where the ration averaged 800 kcals/caput/day. Nutritional surveillance established in the camps found prevalence of wasting varied from 4-17% in June 1993, while in some camps mortality rates were as high as 15-22 times normal. These findings triggered an immediate increase in rations for some camps.

The situation for this displaced population improved considerably throughout the remainder of 1993 and early 1994 as rations ranging from 1,600-2,400 kcals/caput/day were introduced for different camps, using nutritional surveillance data. In January 1994 wasting had dramatically improved to less than 2.5%, and crude mortality rates were less than 0.5/10,000/day (1.5 x normal). Numbers affected and nutritional risk for September 1993 through October 1994 are shown in Figure 5.

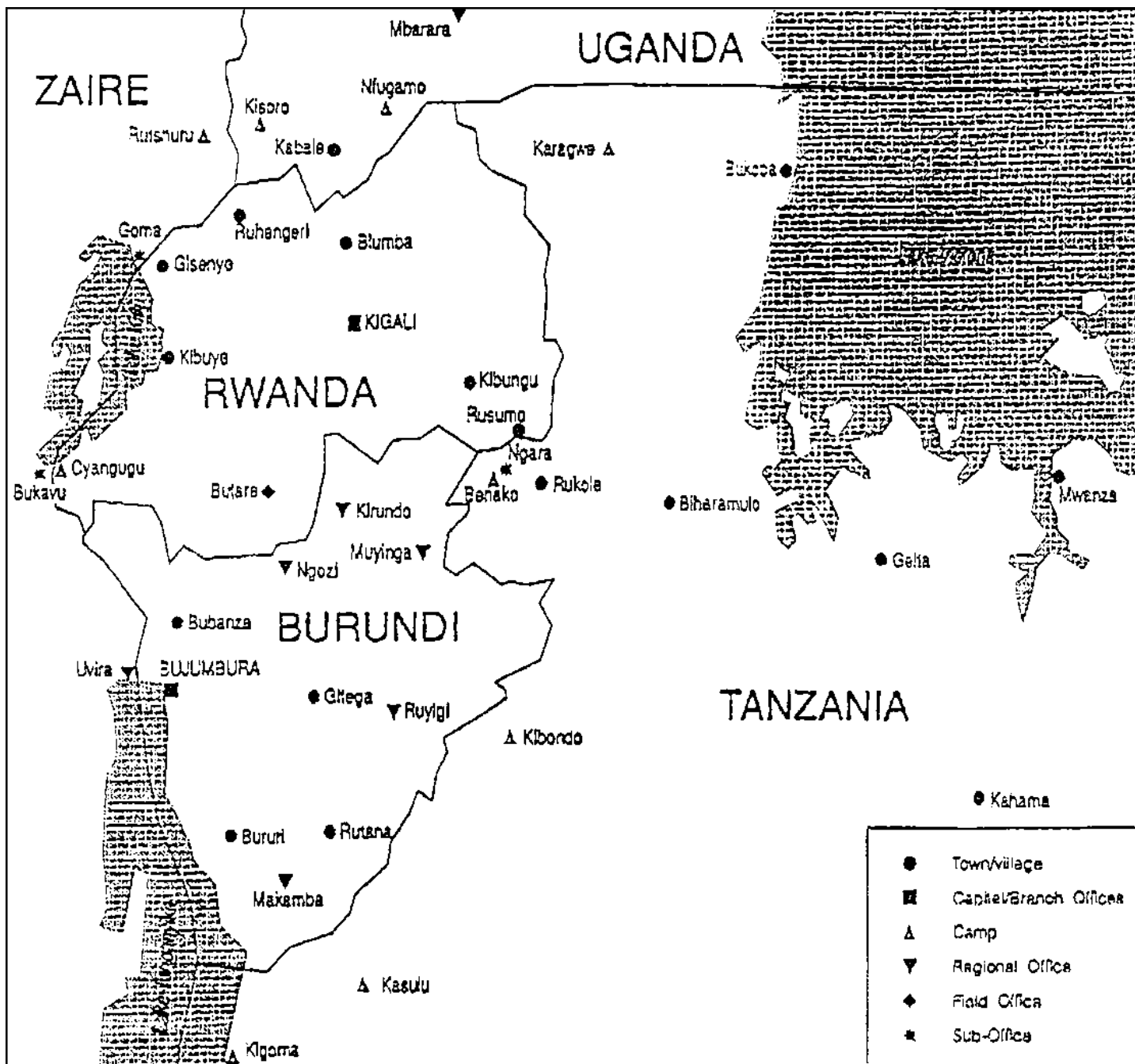
In *Burundi* following an attempted coup d'etat on 20 October 1993 and subsequent heavy fighting, around one million people were uprooted, most fleeing the country within a very short period. Estimates for November were that there were 375,000 Burundi refugees in Rwanda, 325,000 in Tanzania and 58,600 in Zaire. A further 150,000 Burundi people were believed to be internally displaced.



**Figure 5.** Rwanda/Burundi Region – Trend in numbers of refugees/displaced and proportion severely malnourished and at high risk (black area).

The suddenness and magnitude of the crisis completely overwhelmed international relief capacity and initial relief efforts. For the refugees in twenty or so camps in Rwanda, overcrowding, poor sanitation, lack of water and inadequate food availability led to rapidly declining nutritional and health status, and mortality rates twenty times normal in some camps by November 1993. Similar problems were being reported in Tanzania and Zaire, while continued fighting in Burundi was adding to the tens of thousands already killed and displaced in the initial coup attempt.

Increased political stability in Burundi at the start of 1994 resulted in some spontaneous repatriation of refugees from Tanzania by February. However, at this time the situation for the majority of refugees was still critical and in many cases deteriorating. In Rwanda there were many reports of extreme shortage of food at camp level and very bad sanitary conditions. Nutritional data indicated a situation out of control with prevalence of wasting between 20–30% in many camps and mortality rates ranging from 3.7–5.6/10,000/day (12 – 19 x normal) in January. Dysentery and measles were major problems and food rations were less than 700 kcals/caput/day in some camps. While lack of food was partly due to limited transport capacity, the flawed registration system and high rates of ration card thefts also played a role.



Rwanda – Burundi

At this time the situation was similarly critical in Tanzania where surveys found mortality rates of between 2–7/10,000/day (7 – 23 x normal) in different camps. The main causes of death were identified as malnutrition, malaria, and dysentery, due to continued shortages of food and the absence of proper registration and distribution system in conjunction with terrible overcrowding and resulting poor sanitation. Although less data were available, the situation for the Burundi refugees was believed to be similar in Zaire.

In Burundi itself the numbers of internally displaced was estimated to have increased to 282,000 by January 1994 with many in very poor health and in urgent need of support. The food supply situation was also causing concern and fell far short of the estimated requirement of 800 metric tons/week.

The establishment of a new presidency in Burundi along with the beginning of the planting season in March 1994 led to the spontaneous repatriation of many Burundi refugees from Zaire and Tanzania. At the end of March it was estimated that there were over 500,000 internally displaced/returnees registered in Burundi and in need of assistance but only enough food resources to meet 30% of a full ration.

Food deliveries for Burundi refugees in Rwanda improved considerably through March 1994, a fact which was reflected in somewhat reduced prevalences of wasting (20–25%) and lower mortality rates averaging

0.7/10,000/day (3 x normal). The food supply also improved for the refugees in Tanzania, from where over 80% of the refugees had returned to Burundi. In February the ration ranged from 1400 – 1800 kcals/caput/day; mortality rates remained elevated at 0.5–2.2/10,000/day (2 – 7 x normal). *Rwanda Crisis* On 6 April 1994 the area was thrown in chaos with the death of the Rwandan President and ensuing civil war escalation in Rwanda, leading to the displacement of an estimated 2.7 million people within Rwanda, and across borders into neighbouring Tanzania, Burundi, Zaire and Uganda. It is now believed that at least 500,000 people were slaughtered within three months and that over two million people were rapidly displaced within Rwanda. Most of the Burundi refugees managed to return home. The extremely dangerous security situation prevented immediate aid agency access so that there were few reports on the condition of the displaced. However, it was assumed that by June food stocks for the displaced must have run out and that medical goods and clean water were desperately needed.

Between 28–29 April 250,000 Rwandans arrived near the town of Ngara in Western Tanzania. By June this population had rapidly swelled to 410,000 in seven camps. Although arriving in relatively good nutritional and health status, the overcrowding and poor water supplies in the camps drew predictions of imminent increases in malnutrition and mortality. Initial food distributions for these refugees were adequate.

At one point in early July, it was estimated that around 50% of the Rwandan population, about four million people, was displaced or refugees. Kigali fell to the RPF on 4 July. Between 14 and 17 July up to 800,000 Rwanda refugees moved across the border into Eastern Zaire, to the towns of Goma and Bukavu further south. UNHCR stated that this was the largest flow, in terms of numbers in a short time, of refugees ever seen. As the world now knows, cholera and dysentery broke out; it is now estimated by CDC that some 50,000 people – 5–10% of the population – died during the first month after the influx. This was equivalent to a mortality rate of between 20–35/10,000/day, noted as the highest recorded in a refugee population during the past 20 years<sup>3</sup>. In mid August it was estimated that the wasting prevalence among children under five was 18–23%<sup>4</sup>, a figure likely to rise since only a few weeks had passed and those surviving had not yet had time to become more malnourished. Malnutrition rates among children with a recent history of dysentery, and in households headed by women, were significantly higher. The relief programme was effective in rapidly reducing the mortality rates, to a reported 5–8/10,000/day.

<sup>3</sup> Estimated by UNHCR, several NGOs, and CDC (U.S.). Publication forthcoming (Goma Epidemiology Group, 1994).

<sup>4</sup> Surveys carried out in Mugunga, Kitale and Kibumba, by UNHCR, MSF–H, MSF–B, Epicentre, CDC; M. Toole, Pers. Comm.

Rwandan refugees also moved in large numbers to Tanzania, the population rising to an estimated 550,000 at the beginning of October. Camp conditions were reported to be deteriorating, the numbers overwhelming the facilities, with mortality rates of, for example, 10/10,000/day (33 x normal), although the prevalences of wasting were not especially high (around 10%).

In Burundi, in the latter part of 1994 there remained over half a million internally displaced, as well as over 200,000 Rwandan refugees. It was feared that conditions were also deteriorating for these populations, and reports of high levels of severe wasting (e.g. 10%) and elevated mortality rates, up to 2.5/10,000/day (8 x normal) were reported, associated with dysentery and suspected meningitis.

Finally, the most recent reports from Eastern Zaire (November 1994) are that the security situation in the camps is deteriorating, with the militia reforming, external agencies considering withdrawal, and serious risk of major deterioration again in health and nutrition. The situation in the camps is markedly reducing the effectiveness of ration distribution.

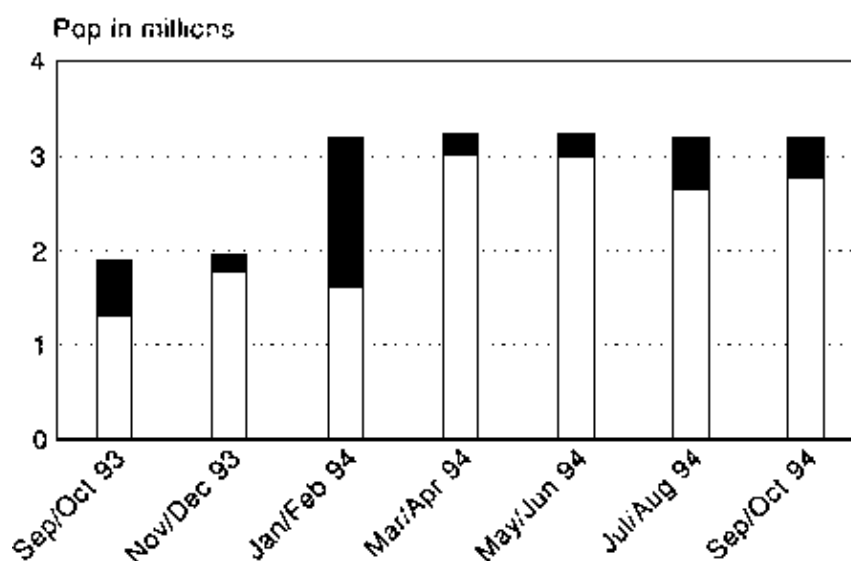
There are many lessons to draw from the handling of the disaster surrounding the Rwandan and Burundi populations. In terms of health and nutrition, on the one hand there is a limit to how rapidly preventive measures can be taken when there are such incredibly rapid flows of enormous numbers of people; on the other hand, even under the difficult conditions of Goma, the situation was brought (at least temporarily) under control within a matter of weeks. Here again, the political and military situation is the overriding influence on the health, nutrition, and survival of the population – but even given that, the extraordinary efforts of external agencies in collaboration with local people undoubtedly saved very many lives, and mitigated the catastrophe.



## Angola

After independence in 1975, a long civil war ensued between the MPLA, aided by the Cuban troops, and UNITA supported by South Africa. Agreement was reached in December 1988 on withdrawal of foreign troop assistance, in arrangements that included independence for Namibia. Fighting continued up until a peace accord in 1991 between the MPLA-led government and rebel forces, which it was hoped would end the 16 years of civil war, and which led to national elections in September 1992. These results were however not accepted, and the war was resumed in late 1992 after UNITA lost the election.

The estimated population of Angola in 1992 was about 10 million. An estimated 2 million are internally displaced (MSF, 1993, p76), with a further 300,000 or more as refugees mainly in Zaire and Zambia. More than 100,000 were reported killed in 1993 (USCR, 1994, p47), and possibly more than that died in 1994. The numbers affected and at risk are shown in Figure 6. Approximately 200,000 Angolans were refugees in Zaire during 1993. Some of these had begun to move back to Angola in 1991/92 in anticipation of being able to resettle, and in fact had given up their possessions. When fighting resumed, many of these remained in Zaire destitute. Together with the instability within Zaire, many of these have not been externally assisted. Although there is no direct information on their nutrition, it is very likely that malnutrition and ill health are major problems. A similar situation affected the 100,000 or so Angolan refugees in Zambia, who also sold their possessions in the unmet expectation that they would be able to return home; but as far as is known, there are no severe nutrition problems among refugee populations in Zambia.



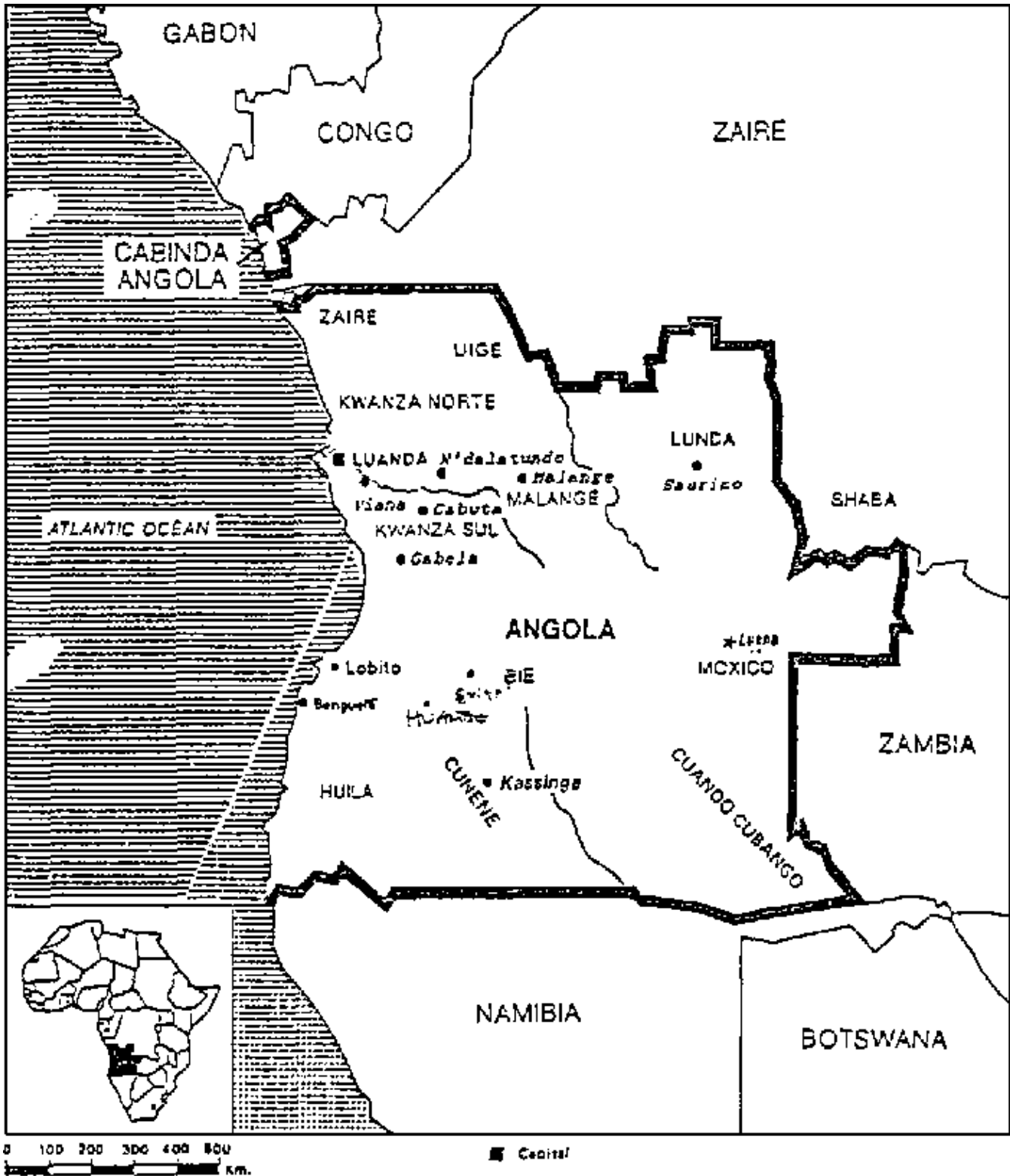
**Figure 6.** Angola – Trend in numbers of refugees/displaced and proportion severely malnourished and at high risk (black area).

The war that began again in late 1992 led to massive displacement and near-famine conditions, particularly in many of the cities. Many Angolans fled towards the coast, an estimated half million ending up as squatters around the capital Luanda, where there were repeated reports of terrible health conditions and widespread severe malnutrition. While the government controlled the major cities, UNITA controlled the countryside and laid siege to many of these cities with catastrophic consequences. Tens of thousands died as a result of the fighting, and many more from famine and epidemic diseases. For example, relief workers in Malange in September 1993 counted some 10,000 orphans whose parents had been killed during the siege.

At the height of the conflict in 1993 UN officials estimated that 1,000 people a day were dying from war-related causes, mostly famine. Nutrition surveys carried out in 1993 and early 1994 found very high prevalences of wasting in a number of major towns although lack of access meant that there were a limited number of such surveys, and that much information on nutritional and health status was based on anecdotal reports. Inevitably the worst reports of malnutrition and mortality were from those towns which had been cut off from aid for long periods due to insecurity and denied access.

In April 1993 it was estimated that just under 2 million war and drought affected people required emergency assistance but that the physical limitations on moving food around in the country due to mined roads, destroyed bridges and damaged airfields meant that the maximum logistics capacity of the UN and NGOs in Angola was about 70% of requirements. The programme was also hampered by shortages of certain commodities such as beans and limited cash funds for transport, non-food items and logistical support. However, food distributions did gradually improve throughout 1993 with numbers receiving a ration increasing

from 230,000 in June to over 1,240,000 in October. Much of this increase was due to successful negotiations with UNITA over access to formerly besieged towns such as Kuito and Huambo. By the end of 1993 estimates of numbers requiring assistance had increased to 3.2 million with food being airlifted to 14 major cities. The increase was largely due to continued fighting in the previous six months. In this case, the distinction between internally displaced and war affected is unclear, and the total numbers of 3.2 million needing assistance are, for these purposes, considered as displaced.



Angola

Humanitarian aid deliveries especially by air continued to improve during 1994 in spite of continued fighting around major provincial capitals and periodic interruptions to relief flights. Meanwhile peace talks in Lusaka

broke down in March 1994, but resumed in mid-1994 and led to agreement, signed in late November 1994, but not yet implemented.

Between October 1993 and June 1994 the numbers of displaced and war affected known to be severely malnourished or at high risk of malnutrition varied between 200,000 and 1.6 million with the peak being in February 1994 (see Figure 6).

A nutrition survey carried out in *Porto Quipiri/Boa Vista* in August 1993 showed total wasting of 41% with 15% severe wasting. In October 1993 a survey in *Malange* found 20% prevalence of severe wasting with an overall wasting rate of 34%. Crude mortality rates ranged between 2.8–5.7/10,000/day (up to twenty times normal). However, surveys in January and February 1994 respectively found that mortality rates had much improved and were down to 1.3/10,000/day (4 x normal) while prevalence of wasting had dropped to 11%. In May prevalence of wasting had further decreased to 7% in *Malange*. Much of this improvement could be attributed to food aid distributions and the implementation of selective feeding programmes. A rapid survey in *Huambo* in January 1994 using arm circumference (for height) found wasting prevalences to be between 36–48%, while eye witness accounts from *Kuito* and *Menongue* described a catastrophic nutritional and medical situation largely due to intensified fighting and resulting lack of relief flight access. In April 1994 anecdotal reports from *Kuito* and *Huambo* were still describing the existence of grave nutritional emergencies.

Further assessments were possible after August 1994, as a number of cities became accessible again, and the effects of the break in assistance could be seen. For example, preliminary results from a survey conducted in *Malange* in early September 1994 found levels of wasting at 15% and severe wasting at 5%. This was a substantial increase from earlier results, e.g. 7% in May 1994. It is probable that similar deterioration took place in other cities such as *Huambo* and *Kuito*. Survey results in mid-July in *Dondo* gave a prevalence of wasting of 8%, with 3% severe. These lower levels were attributed to successful NGO feeding programmes.

A number of outbreaks of epidemics have been periodically reported, such as cholera in certain areas in June 1994, and meningitis in August. These no doubt have a devastating effect in the malnourished and weakened population.

Angola is estimated to have ten to 20 million mines, ringing many of the major cities. Civilian casualties, notably among children, from mine injuries are extensive, and the situation gravely hampers return to productive life. The main planting season in Angola is September, and there are fears that inputs to allow any reasonable harvests this year may be unavailable, as well as the inability of the population to work the land.

Despite the incredible difficulties, there is little doubt that the humanitarian effort, dependent in large part on expensive airlifting, did significantly reduce the extent of famine and suffering in the population. The international effort will need to continue, but clearly the possibility of fundamental improvement depends upon a political solution and peace at last for the ravaged population of Angola.

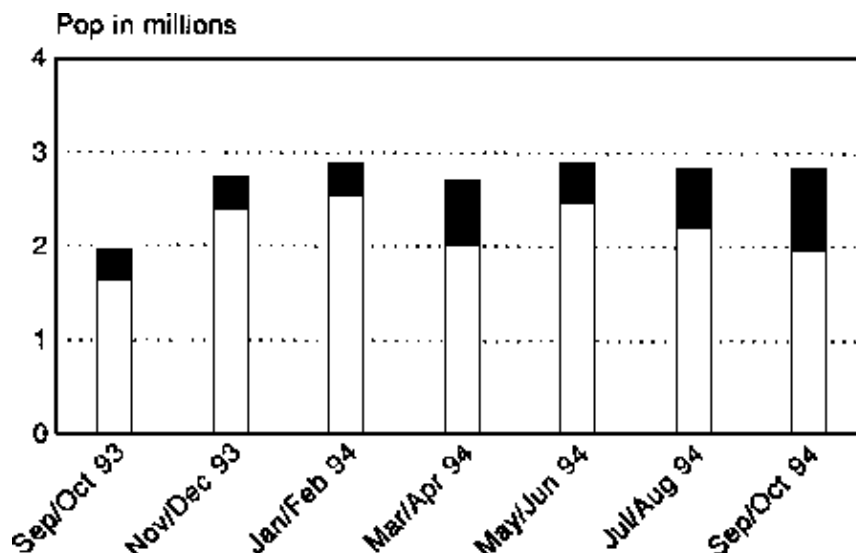
### **Liberia Region**

Fighting broke out in Liberia at the end of 1989, between the NPFL (National Patriotic Front of Liberia) forces and those of the government, at that time headed by Samuel Doe. The fighting rapidly involved large numbers of the civilian population in widespread violence and atrocities. In August 1990 a regional peacekeeping force, the Economic Community of West African States Cease Fire Monitoring Group (ECOMOG) intervened to try to set up an interim government. A truce was established in November 1990, which brought uneasy peace until around October 1992. At this time, civil war erupted again, with a number of different factions: as well as the NPFL which in 1992 controlled most of the countryside, ULIMO attacked in the west of the country from Sierra Leone. Another faction, the Armed Forces of Liberia (AFL) joined the fighting in 1993, and ECOMOG became increasingly embroiled in the war. More recently further groups (e.g. the Lofa Defence Force (LDF) and the Liberian Peace Council (LPC) joined the fighting.

As Médecins Sans Frontières has said: "Long before Somalia, Liberia was the first African country to commit 'national suicide'. It has been ravaged since December 1989 by fighting of extreme cruelty, the initial phase of which drove out nearly 700,000 refugees." (MSF, 1993, p53).

Overall it is estimated that nearly three quarters of Liberia's 2.3 million population has been displaced. The war has involved neighbouring countries, Sierra Leone, Côte d'Ivoire, Guinea. The trend of total numbers

affected, and their degree of nutritional risk, is shown in Figure 7. The distribution in October 1994 was estimated as: Liberia, 1,700,000; Sierra Leone, 300,000; Côte d'Ivoire, 330,000; Guinea, 530,000.



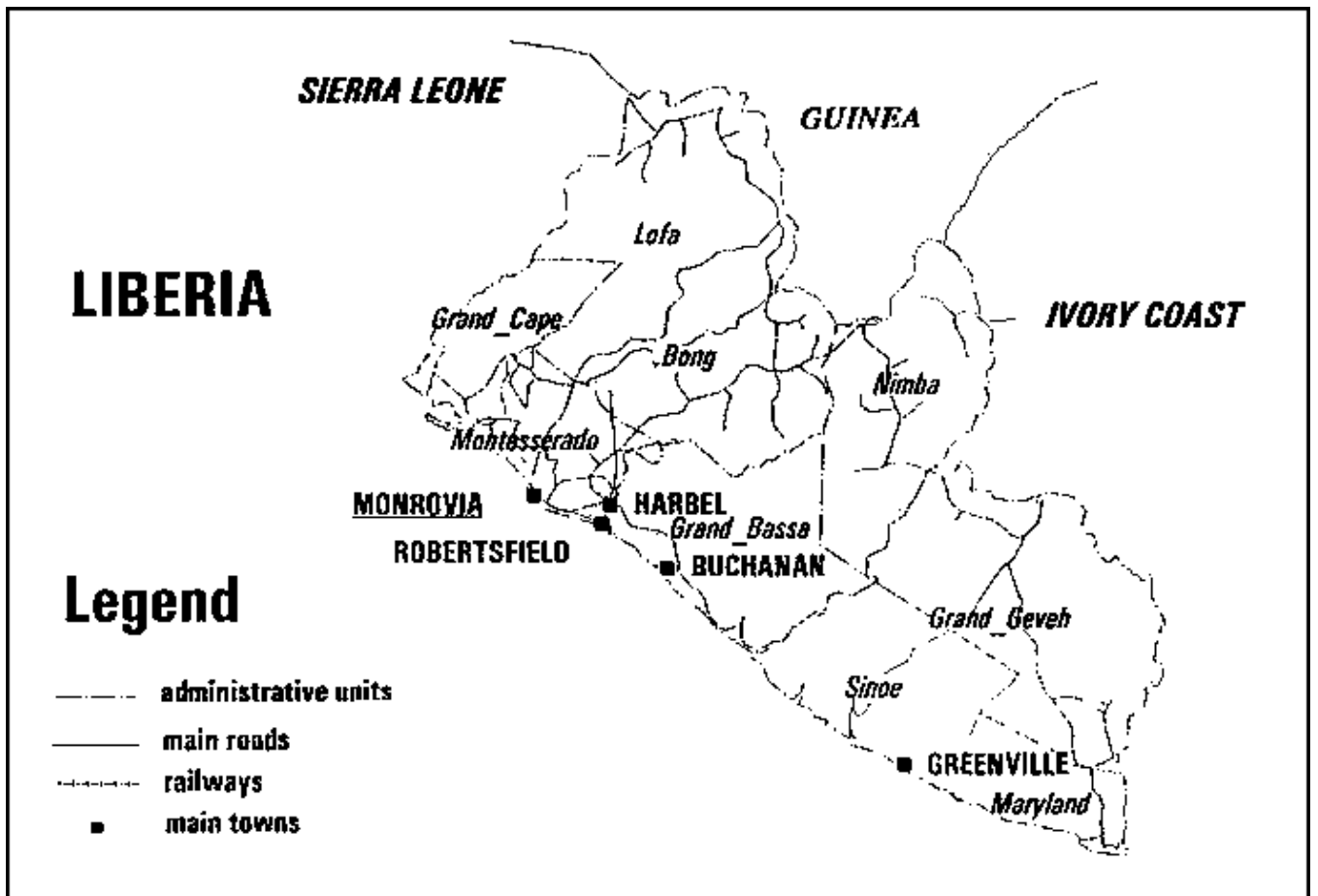
**Figure 7.** Liberia Region – Trend in numbers of refugees/displaced and proportion severely malnourished and at high risk (black area).

Overall, reports of extreme malnutrition and starvation have come from different parts of the affected area at different times. When the fighting started again in October 1992, considerable attention was directed towards nearly 200,000 people cut off in North West Liberia under appalling conditions, to whom supplies had to be air lifted. At the same time there was a temporary ban on cross border deliveries in an attempt to enforce an arms embargo.

The security situation in both Liberia and Sierra Leone deteriorated in the latter part of 1994, with further movements of displaced people. In Liberia, increased levels of violence led the virtual suspension of NGO activities outside the areas controlled by ECOMOG. The elections previously scheduled for September were not held, although a new agreement was made to hold elections in October 1995.

The prolonged conflict has meant that food production and livelihoods for this largely rice subsisting economy have been severely disrupted. Peace keeping forces (ECOMOG) have attempted to safeguard cross-line deliveries of food aid to affected populations, while air drops to inaccessible areas and cross-border food deliveries, e.g. from Côte D'Ivoire, have also been extensively used. However, in spite of substantial successes in distributing food aid and other relief resources, there have been large population groups who have been effectively cut off from food aid for long periods who have experienced extreme levels of malnutrition and mortality.

Pre-war prevalence figures for wasting in Liberia have been reported at about 2%. Since the civil war restarted in October 1992 high levels of wasting and mortality have been recorded in a number of locations. At the end of 1993 levels of wasting above 30% were recorded in Upper Lofa county while in Upper Margibi county prevalences of kwashiorkor of between 39–45% and mortality rates of 14.4/10,000/day (50 x normal) were recorded in July 1993. Rapid assessments carried out in Upper Margibi, Bong, Lofa and Grand Bassa counties in January 1994 showed between 15–55% wasting with crude mortality rates of 2/10,000/day (7 x normal). Survey results in the first half of 1994 showed lower levels of wasting and mortality, but still high: e.g. 13% wasting and crude mortality rates of 1/10,000/day (3 x normal) in Nimba county in April. Much of the improvement at that time was attributed to better capacity for food relief distribution by international relief agencies, as well as some local rice harvests.



Liberia

Nutrition survey results in June and July 1994 tended to find comparatively low levels of wasting, around 10%, from a number of areas. On the other hand, in certain towns much higher levels were recorded – for example 42% wasting, 18% severe, in Garney – towns in which no food had been distributed for nearly a year, and where water and sanitation and lack of health services were a major problem. Subsequently, with the pullout of international NGOs from many areas, and only *ad hoc* food distribution, it was expected that nutrition would deteriorated widely again.

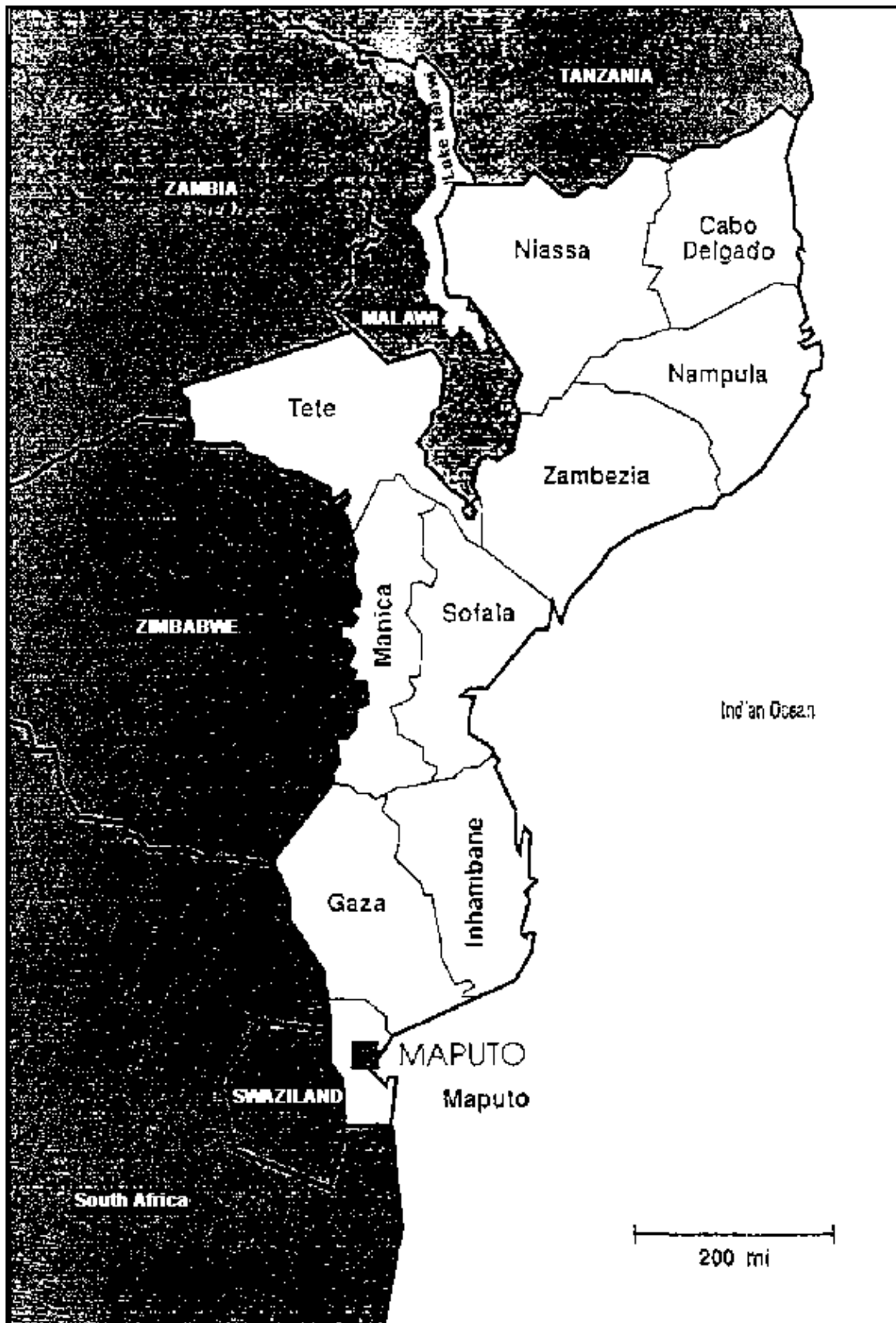
There is little information on nutrition amongst displaced populations in Sierra Leone, Côte d'Ivoire, and Guinea. In the less accessible areas in *Sierra Leone* (for reasons of distance or insecurity) serious food shortages are considered likely; some areas have not had a harvest since 1991, and the 300,000 displaced people in Sierra Leone are likely to be seriously affected by this. On the other hand, those in accessible camps may be better off, and recent nutritional survey data shows around 10–15% wasting in young children in camps in Sierra Leone. Such values are still high, but likely to be less than those where there are severe food shortages and inaccessibility. Moreover in the latter outbreaks of cholera have been reported. Poor registration systems in the refugee camps had led to a flawed distribution system with insufficient rations being distributed to some households as a result.

There are an estimated 530,000 Liberian and Sierra Leonean refugees in *Guinea* and a further 230,000 in *Côte D'Ivoire*. The health and nutritional status of these populations has generally been adequate although there have been reports of problems among new arrivals in Guinea. In Côte D'Ivoire many refugees work on local farms and are largely self-sufficient while in Guinea an estimated 120,000 are enrolled on agricultural projects leading to varying degrees of self-sufficiency. New arrivals in Guinea, many of whom are not registered immediately and who consequently do not receive a general ration, show high prevalences of wasting – up to 25% according to some reports.

The main problems in providing relief to the refugee and displaced population in Liberia and the neighbouring countries has been inaccessibility due to insecurity. These problems have been compounded by lack of vehicles for transport and roads and bridges made impassable by the rains.

### Mozambique Region

The signing of the peace accord in October 1992 between the Mozambican Government and Renamo was a crucial step in ending 16-year civil war which had created over 1.6 million refugees in surrounding countries and the internal displacement of a possible further 3.7 million people. The protracted hostilities meant that over a million refugees were displaced to Malawi, 250,000 to South Africa, 120,000 to Zimbabwe with the remainder distributed between Zambia, Swaziland and Tanzania. But although the general fighting has drawn to a halt, peace has yet to spread throughout the shattered countryside.



Mozambique

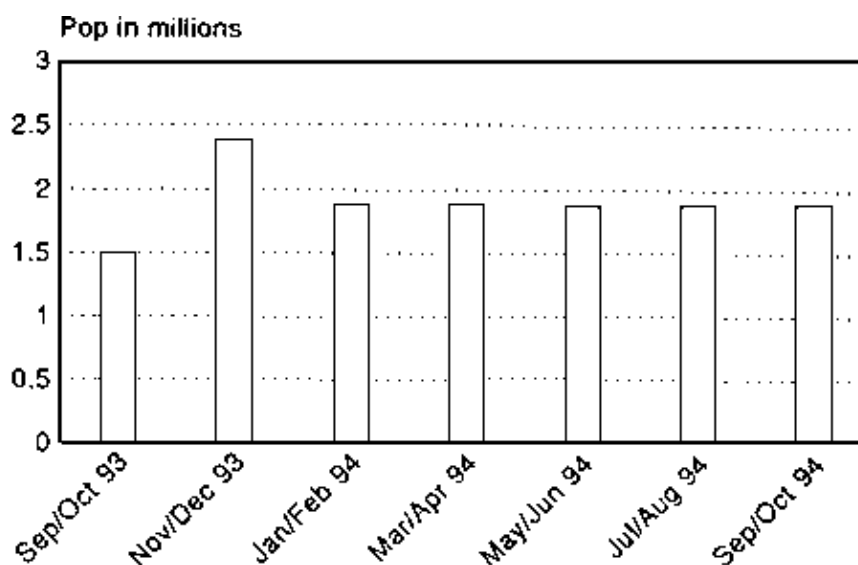
The civilian population for most of the 80s and early 90s was described as "trapped between war and starvation" (MSF, 1992, p39). In 1992, it was described as an archipelago of fear and hunger, because of the movement of population into protected villages around the towns. This meant that villagers were far from their land, could no longer farm, and became totally dependent on international food aid. "Pushed by hunger and fear, the peasants of Mozambique have set out to look for a little peace and some help....Some camp outside the towns, others dressed in tree-bark and fed on roots, wander across the countryside in a pitiful state, while two million people are refugees in neighboring countries, half of them in Malawi, totally dependent on international aid." (MSF, 1992, p39). The conflict in the countryside gained its own momentum, even when the warring parties changed – South Africa renounced its support for Renamo, and Frelimo, initially pursuing socialist policies, turned towards the West. But the conflict was beyond government control, and degenerated into banditry, ruining the lives and livelihood of millions of civilians. Added to all this, in 1992, the worst drought of the century struck Southern Africa, including most of Mozambique.

In 1993, at least half a million Mozambican refugees repatriated, mainly from Malawi. The repatriation was considered: "the largest and promising to be one of the most difficult ever undertaken", including an estimated two million people who began to return to their homes (USCR, 1994, p61). "Many refugees will find no towns, no markets, no schools, no health clinics – virtually nothing with which to reintegrate" the US Committee for Refugees reported. "They will have no choice but to rebuild an entire economic and social structure from scratch" in what may be the world's poorest country. Moreover, this resettlement went on at a time when much of Mozambique was only slowly recovering from the severe drought.

With the cessation of hostilities, international agencies identified near famine conditions in many parts of previously inaccessible Mozambique. Large scale emergency feeding, health, water and sanitation programmes were therefore established and by mid-1993 the nutritional and health situation was largely under control, at least the accessible areas.

Large scale re-settlement and rehabilitation programmes were implemented by numerous agencies for returning refugees and the internally displaced so that by April 1994 an estimated 800,000 refugees had returned to Mozambique while a further 900,000 displaced people remained waiting to return to their land and re-build their homes.

The main nutritional and health problems during the recent period have been amongst the new returnees, especially those returning to relatively inaccessible areas served by poor infrastructure. Poor sanitation and water availability has also lead to periodic outbreaks of dysentery and cholera during this period. Trends in numbers and those at risk are shown in Figure 8.



**Figure 8.** Mozambique Region – Trend in numbers of refugees/displaced

Levels of wasting and mortality amongst the Mozambican refugees in Malawi, Zimbabwe, Zambia, South Africa and Swaziland generally remained low throughout these refugee emergencies, and the situation is widely regarded as being largely successfully controlled. However, widespread outbreaks of pellagra (niacin deficiency) occurred amongst refugees in Malawi and Zimbabwe. The peak of the outbreak in Malawi was in 1990 when over 18,000 cases were reported. Subsequent fortification of maize flour with niacin led to the virtual disappearance of this condition. In Zimbabwe pellagra remained a problem up until August 1992 when ground nuts were introduced to the general ration.

In Mozambique, crisis levels of wasting were found in several provinces following the signing of the peace accord in October 1992. Nutrition surveys, conducted in accommodation and reception centers set up for returnees and longer-term internally displaced, frequently found levels of wasting above 20%. By mid-1993 repeat surveys showed a much improved situation in these centers. Subsequently, nutrition monitoring by a variety of NGOs working throughout Mozambique have generally found low levels of wasting (under 10%) with occasional "pockets" of famine in particular provinces. Thus, in June 1993 levels of wasting in parts of Gaza province were above 15%, and were 17% in Chokwe district and 9–20% in parts of Guija district.

Cholera and dysentery were reported in Nampula, Capo Delgado and Chuire provinces in the second half of 1993 while water problems were being reported in Gaza, Inhumbane, Manica and Zambezia provinces at the same time.

The main nutritional problems throughout the resettlement and rehabilitation phase of the Mozambique programme has been amongst those refugees and internally displaced groups that have returned home after the planting season or have not had implements and inputs for agricultural production and have been cut off from emergency relief food for long periods because of inaccessibility. Problems of inaccessibility have been exacerbated by the widespread existence of mines and rains washing away infrastructure. Nutritional survey results have therefore frequently shown highest levels of wasting in areas with the largest numbers of recent returnees.

The recent history of nutrition for Mozambican refugees and displaced is one of cautious success. Most reports are that the nutrition and health situation is under control, both for the returnees that reach assistance within Mozambique, as well as continued successful protection of health and nutrition for the refugee populations in Malawi, Zimbabwe, and Zambia. The situation for the several hundred thousand refugees in South Africa in the early 90s is not clear, since this may have changed with the recent developments in South Africa. Overall the experience of Mozambican refugees demonstrates that it is indeed feasible to protect health and nutrition when there is access and adequate security.

## **Somalia**

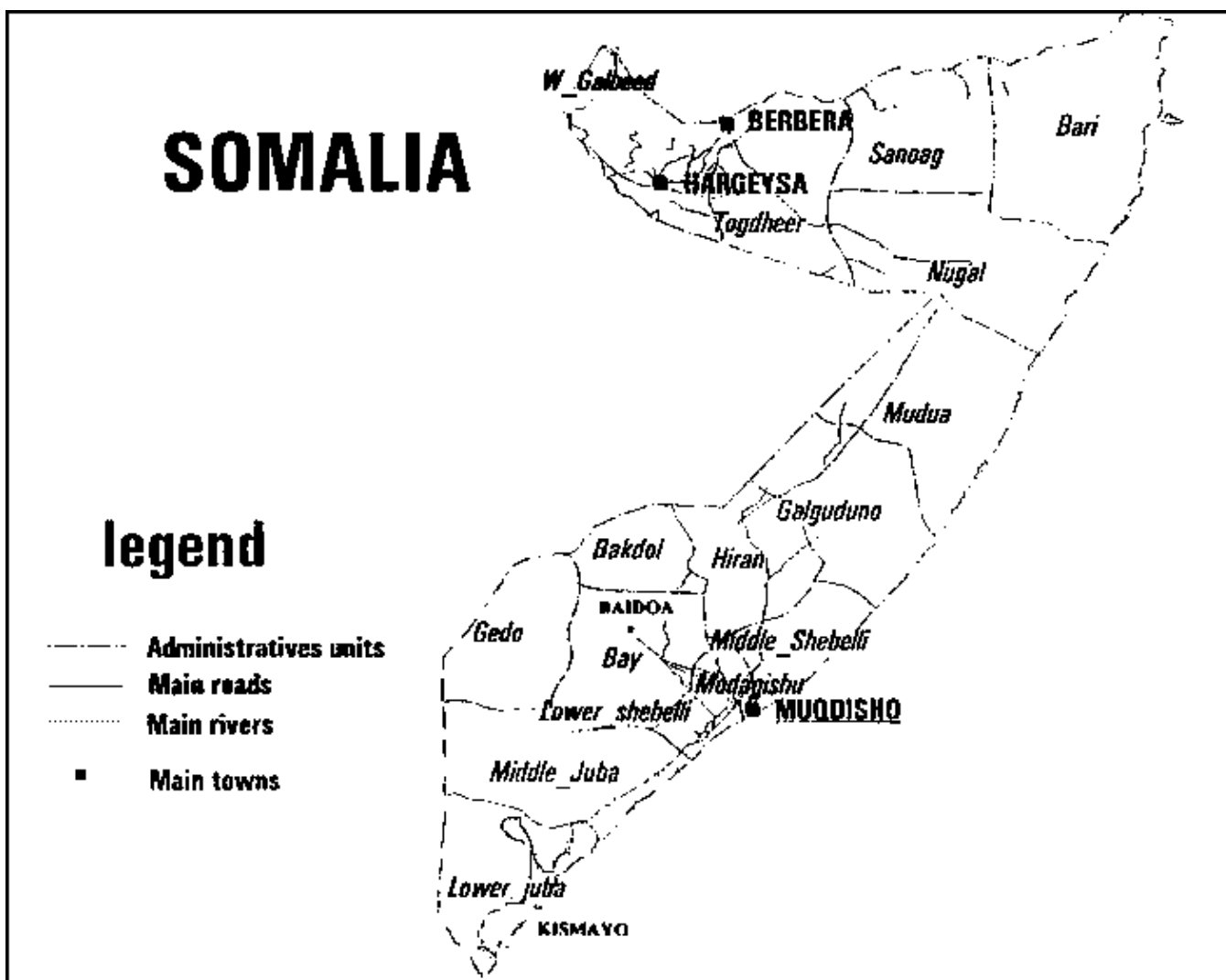
The catastrophic civil war of recent years was triggered in May 1988, when rebels of the Somalia National Movement (SNM) from Somaliland in the north briefly took the towns of Hargeisa and Burao. Government retaliation was brutal, the towns being bombarded and partly destroyed, with tens of thousands of civilians being killed, and over half a million people fleeing to Ethiopia (MSF, 1992, p45). This led to an increased uprising, involving a number of different clans, and leading to destruction of much of the capital, Mogadishu. General Said Barre was overthrown in January 1991, which then plunged the capital into even more extensive internecine warfare. This continued through much of 1991, and "all semblance of law disappeared in the capital, transformed into a closed battle field where the clans fought for the remains the remains of a state which had long since collapsed." (MSF, 1992, p46). Although the level of violence declined somewhat in early 1992, the towns and the countryside were wrecked, and famine began to spread from early in the year. Many thousands of the population were displaced, and for example in coastal towns near Mogadishu where many of these congregated, appalling mortality rates and malnutrition were reported. The famine peaked in 1992, with only limited assistance being provided by external agencies. In December 1992, under UN authority, 30,000 troops under US command landed in Mogadishu, with a mandate "to establish a secure environment for humanitarian relief operations in Somalia".

By this time, it was estimated that up to half a million people had died due to violence, famine, and disease; there were even estimates that up to half the pre-school children had perished (USCR, 1994, p66, quoting UN and ICRC). In a population of originally around eight million, around two million were internally displaced, another million had fled to Ethiopia and Kenya, and around 4.5 million were estimated to require food aid.

Lack of international agency presence in Southern and Central Somalia during 1991 and early 1992 meant that there were limited data on the nutritional and health situation, until mid-1992 when surveys began to show appalling levels of wasting and mortality. Surveys in and around Baidoa town in August and September 1992 found levels of wasting of 100% and 42% respectively. Here crude mortality rates between April and October 1992 and in the 30 days prior to a November/December survey were 17.2/10,000/day (60 x normal) and 23.4/10,000/day (80 x normal) for the displaced population of Baidoa. These data were believed to be representative of other areas in Southern and Central Somalia. They were at the time "some of the highest mortality rates ever recorded", according to CDC. It was estimated that there were at least 1.6 million displaced people affected by the crisis in this part of Somalia.

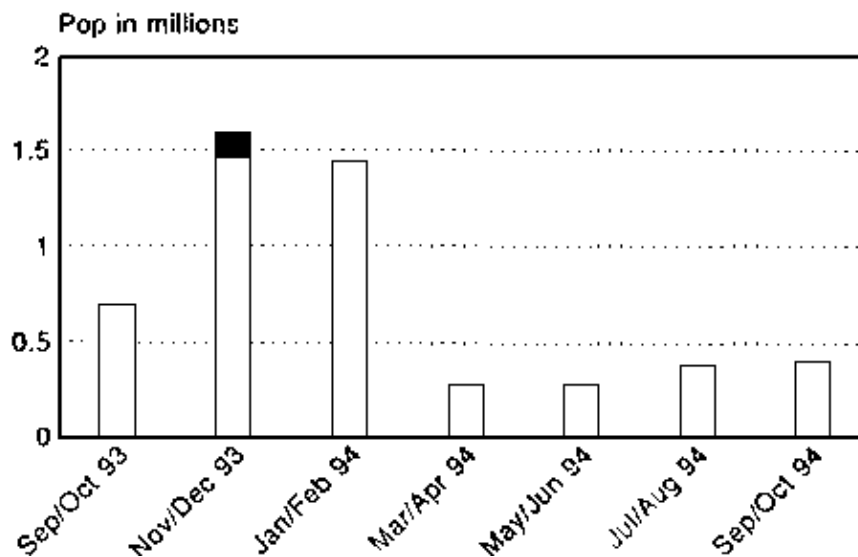


The situation began to improve in Somali at the end of 1992 largely as a result of the UN/US military presence and the creation of safe routes for food and other relief convoys. By mid 1993 general food distributions were phased out and relief efforts were re-directed to food for work rehabilitation programmes for an estimated 400,000 people. Nutritional surveys from mid 1993 onwards show a considerably improved situation although periodic incidents continued to threaten security and economic recovery.



Somalia

By mid 1993 the food security situation had improved so much that only a small proportion of the 1.6 million displaced were thought to be at any significant risk. Nutrition survey results from Kismayo in December 1993 found levels of wasting under 12% while a survey in Genale in February 1994 recorded levels of wasting of only 2.8%. A survey in April 1994 in Mogadishu found levels of wasting of 8.1%. It was estimated that during 1993, around 70% of all children were vaccinated against measles (USCR, 1994, p79). Estimates of numbers affected September 1993 through October 1994 are shown in Figure 9.



**Figure 9.** Somalia – Trend in numbers of refugees/displaced and proportion severely malnourished and at high risk (black area).

By mid-1994, although there were a considerable number of security incidents, the number of displaced was estimated at about 400,000, and 380,000 were receiving emergency aid. The rainfall was good, and seed and tool distributions were quite wide, so that a good harvest was achieved in many of the fertile areas. Generally the nutrition situation became normal for the area. Worries began to surface however that planned troop withdrawals in early 1995 could lead to an escalation of insecurity, which could rapidly affect food availability, and lead to a resurgence of the problems of 1992.

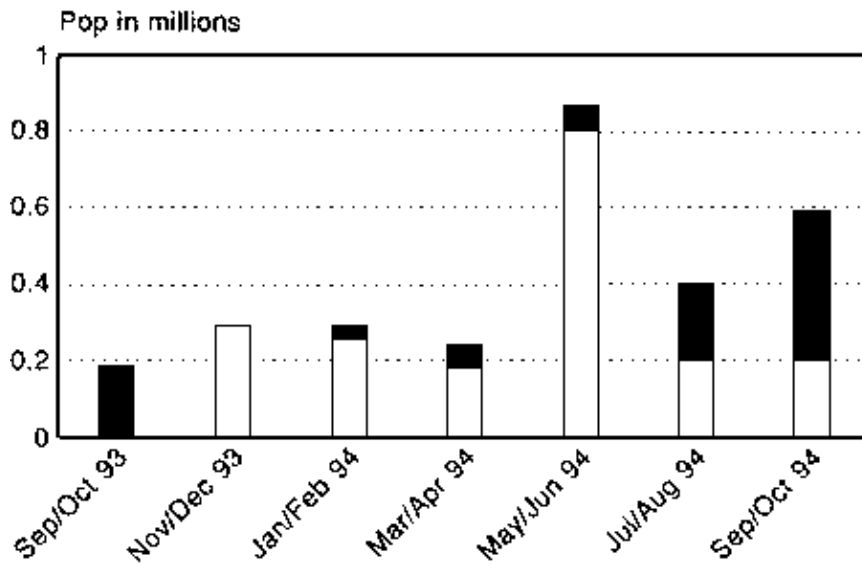
The recent history of Somalia illustrates both the devastating effect of anarchy and civil war on survival, and how this can rapidly lead to terrible famine in a poor and vulnerable country. It also illustrates that when humanitarian assistance can be distributed, in this case importantly including food, the nutritional situation for the survivors can return to normal relatively quickly.

#### Shaba Region in Zaire

Internal ethnic conflict had caused an estimated 700,000 people to become internally displaced by end-1993 (USCR, 1994, p73). The largest group, around half a million people, were from Shaba Province (formally Katanga) in Southern Zaire, moving to Kasai. Another large group is in North Kivu, about which little nutrition information is available, but there have been reports of food shortages and epidemics. More is known about the situation in Shaba, as outlined below, and shown in Figure 10.

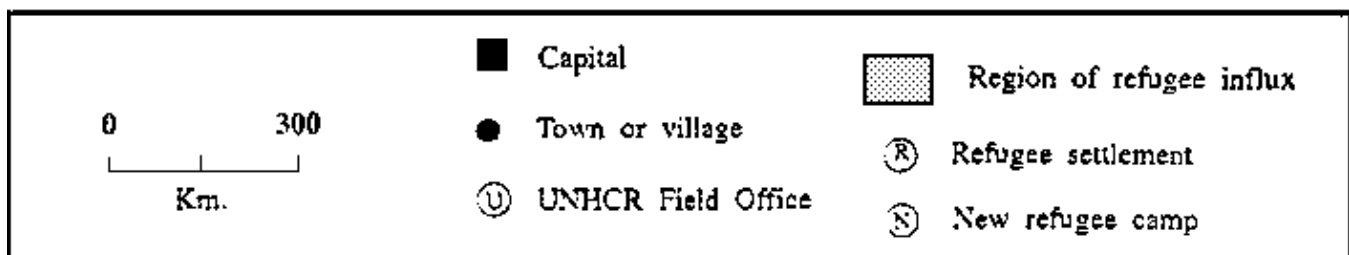
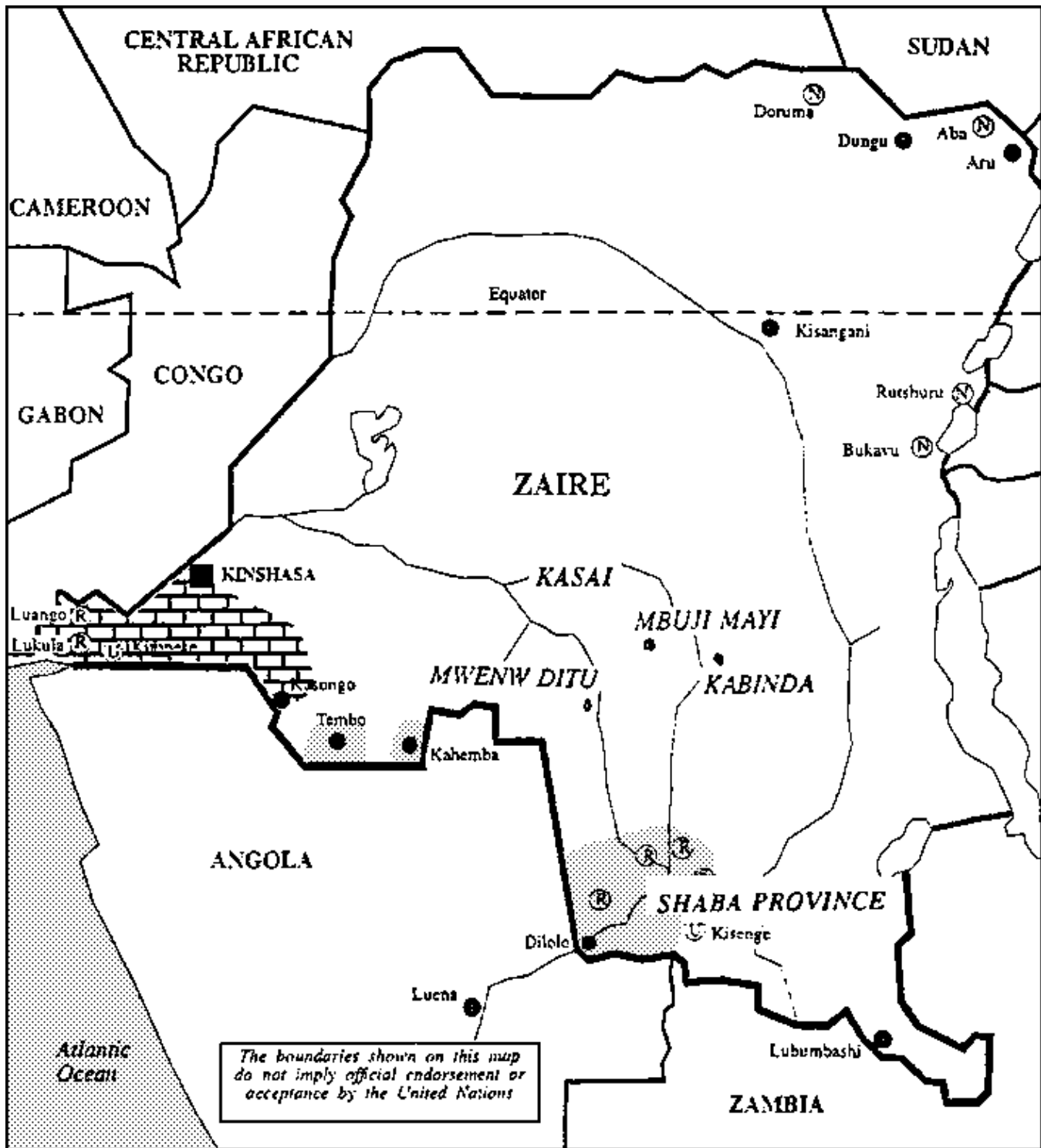
Ethnic violence in the mining region of Shaba starting in August 1992 led to the displacement of hundreds of thousands of people of Kasain origin North, towards their original home often from generations ago. Many resided in transit centres or camps for months while others returned to Kasai region with a view to resettlement. The majority of this displaced population had been mining for generations and so had little agricultural experience.

Throughout 1993 reports from many transit areas/centres indicated extremely high levels of wasting and mortality. This was largely due to the absence of a systematic food distribution programme, and high levels of malaria, dysentery and measles. Thus, in September, mortality amongst the displaced had reached 6.7/10,000/day (22 x normal) in the transit town of Mwene Ditu, with levels of wasting above 25%. Similarly high levels of wasting continued to be reported until March 1994. Water shortages and crowding, combined with inaccessibility, led to a critical situation for the 200,000 or so (resident and displaced) in Mwene Ditu.



**Figure 10.** Shaba, Zaire – Trend in numbers of refugees/displaced and proportion severely malnourished and at high risk (black area).

In other transit towns, such as Mbuji Mayi (population approximately one million, of which more than 100,000 are displaced) food and water availability were reported inadequate, with malnutrition high, in mid-1994. Elsewhere, in West Kasai, for example Kananga, where local church and international NGOs were able to provide relief and assist resettlement, nutrition was better.



### Zaire

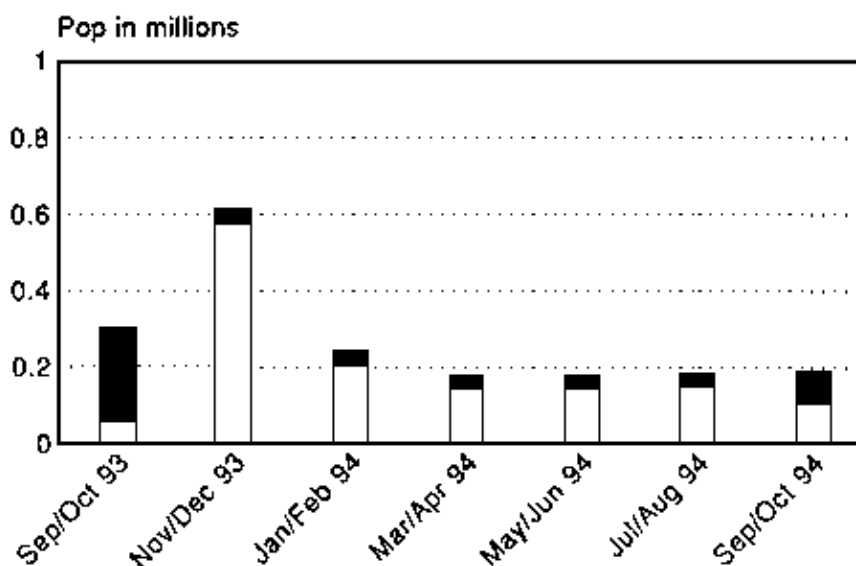
Large numbers of displaced started to arrive in their ancestral place of origin in East and West Kasai in June 1993 with numbers reaching 140,000 in December. However, apart from some NGO distributions, there were

no general ration deliveries in 1993. This delay was due to a variety of factors including delayed needs assessment missions, donor reluctance to pledge food due to political considerations and high transport costs, and shortage of funds within WFP. This situation led to predictably high levels of wasting with reports of 38% wasting in Kabinda in Eastern Kasai in February 1994. By March 1994 limited food supplies carried by aircraft and train began to reach this population, although inadequate donor funding seriously constrained planned delivery schedules.

This large displaced population in Zaire can be successfully resettled, if the level of ethnic conflict moderates. On the other hand, there are real fears that if ethnic violence increases and deliberate steps are not made to lower the political involvement, there could be degeneration into much widespread unrest, displacement, and all the associated threats to survival.

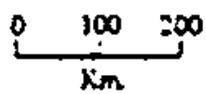
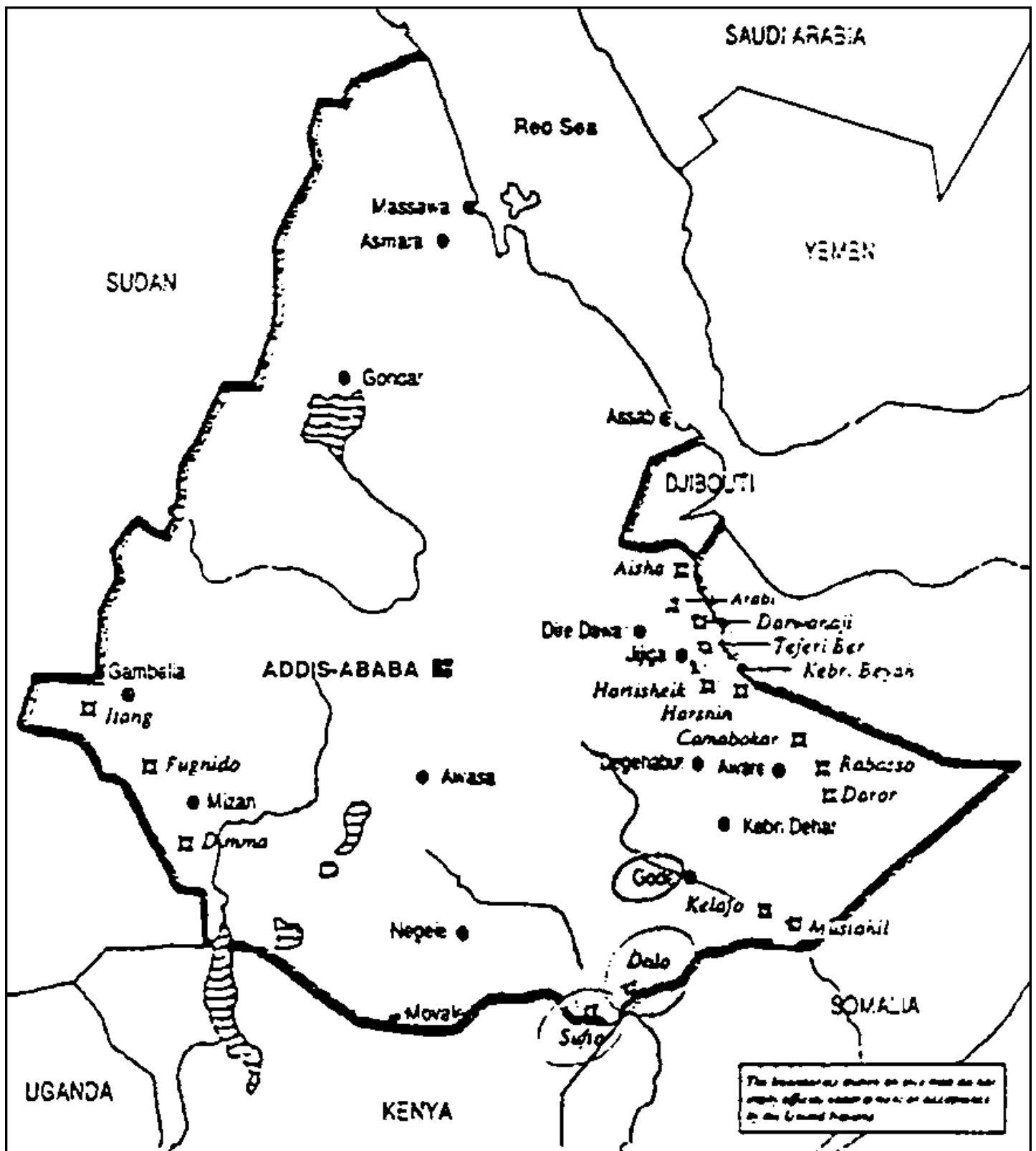
## Ethiopia

Many different populations of refugees and displaced people coexist in Ethiopia. Moreover, often these are from similar ethnic groups, some of which originate from within Ethiopia, others from outside, e.g. Somalis in the East. Thousands of Ethiopians have been displaced by combinations of drought and ethnic conflict, and have become dependent on food aid. This led UNHCR and other agencies to try to deal with the needs by a "cross mandate" strategy, whereby all the needy people in Eastern Ethiopia were to be assisted, whether or not they were formally refugees. The situation in Eastern Ethiopia (Ogaden region) was often very bad, in terms of malnutrition and epidemics such as malaria, and these, together with the political situation, made it particularly difficult to resettle the displaced people. Describing the nutrition situation is thus complicated, and subject to rapid change, but two particular groups have been especially badly affected: Somalis displaced into Eastern Ethiopia, near the border running South East from Djibouti, around Hartisheik; and groups of Ethiopians displaced back from Somalia together with some internally displaced, around Gode, near the border with Somalia and Kenya in South Eastern Ethiopia. The nutrition information on these two groups is summarized here, and illustrated in Figure 11.



**Figure 11.** Ethiopia – Trend in numbers of refugees/displaced and proportion severely malnourished and at high risk (black area).

The situation for the 300,000 Somalis displaced from the North of Somalia in early 1988 deteriorated quickly. In *Hartisheik* refugee camp levels of wasting increased from 8 to over 30% in a six month period as receipts of general food rations were frequently under 1000 kcals/*caput*/day. High levels of scurvy were also found in Hartisheik and other camps. A major reason that general rations were grossly deficient during this period was the massive over-registration of refugees which led to donors reduce pledges, to provide for more realistic population numbers. Thus, the ration became inadequate for those households with legitimate numbers of ration cards. Water and health service provision was also extremely inadequate at the start of this refugee crisis with frequent reports of water riots in the early stages of the programme.



- Capital
- Town or village
- ▣ Shelters/reception centers

Ethiopia

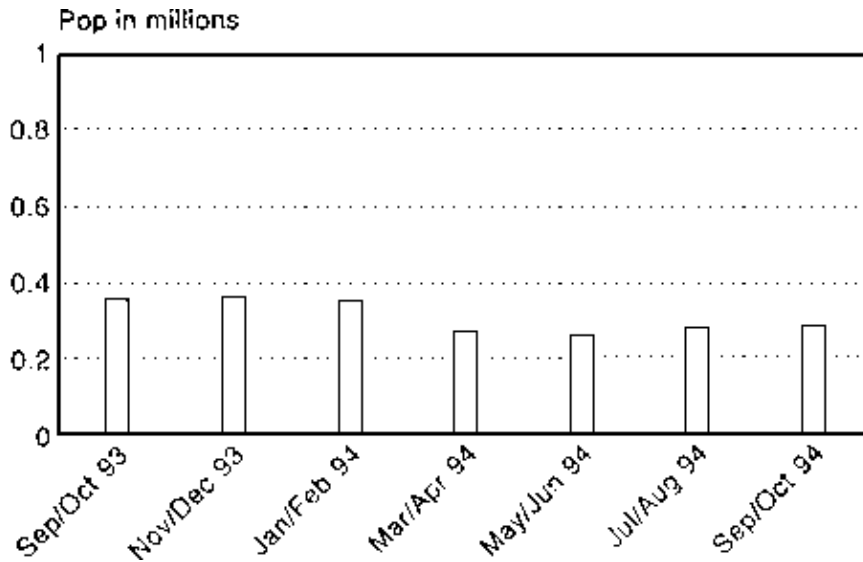
The situation for this population gradually improved as the refugees began to secure alternative sources of food apart from the general ration. By mid-1993 levels of wasting in the five camps ranged from 5–16% and although general ration provision was only between 20–70% of energy requirement the excess ration cards in the system (it was estimated that ration cards outnumber refugees by 3 to 1) and other coping strategies, provided food security for the majority of the camp populations. By mid-1993 the Somali refugee population was acknowledged to be only 100,000. However, by mid-1994 surveys had shown an increase in levels of wasting in camps in this area. Nutrition surveys in May and June 1994 showed levels of wasting ranging from 9% in Hartisheik B to 21% in Darwonji and Teferi Ber.

The civil war in Somalia in 1991–92 also led to the displacement of large numbers of Ethiopian refugees from Somalia back to the Ogaden region of Ethiopia. One such returnee population of over 50,000 people, which included some internally displaced, came to reside in camps around *Gode*, and in the town of Bohelagare. With limited food aid provision and inadequate health care services the nutritional and health status of this population began to deteriorate rapidly, so that by September 1992 it was experiencing a crisis. By October 1992 mortality rates were found to be as high as 20 times normal in one camp and wasting rates in excess of 40% in three camps. By June 1993, mortality rates had declined to three to seven times normal (0.7–1.7/10,000/day) although wasting rates were still around 40%. Mortality rates more or less remained the same until the beginning of 1994, when rates three times times normal were recorded (0.9/10,000/day). Wasting rates were around 25% at the end of 1993, and similar levels of wasting and mortality were reported in June 1994. Scurvy, vitamin A deficiency, and anaemia were regularly reported at clinics within the camps throughout this period, with incidences of scurvy as high as 3.5/1000/month in Gode camp in November 1993. In January 1994 the rate was 12.8/1,000/month while incidence of signs of vitamin A deficiency were 0.6/1000/month.

These consistently high mortality and malnutrition rates since mid 1992 were due in part to erratic general ration distributions caused to some extent by the level of insecurity and banditry in the area. Throughout 1993 ration receipts were less than 1000 kcals/caput/day and there had been little progress in developing self-sufficiency through rehabilitation programmes.

### **Refugees in Kenya**

Refugees from Somalia, Ethiopia, and Southern Sudan have been living in a number of camps, mostly in the arid North of the country, although some were settled on the coast around Mombasa, and near Nairobi. The population of Somalis, which may have reached nearly 300,000 during 1992–93, was fleeing the civil war in Somalia, and began to repatriate as conditions improved in 1993 and 1994. Numbers for September 1993 to September 1994 are shown in Figure 12. During the same period, around 80,000 Ethiopians crossed the border into Kenya, and again some of these returned after the peace accord in late 1992, which specifically invited refugees to return home. The Sudanese, around 30–40,000, are in the North West of the country, and generally in well organized and secure situations. The nutrition and health situation of the Somali and Ethiopian refugees in the North East of the country has been particularly precarious, and some details are given here. In particular, not only have high levels of protein energy malnutrition and elevated mortality been reported, but persistent outbreaks of micronutrient deficiency, especially scurvy, have occurred; there are some reports of renewed outbreaks of scurvy in late 1994.



**Figure 12.** Kenya – Trend in numbers of refugees.

The situation amongst the Somali and Ethiopian refugees in Kenya rapidly deteriorated throughout the first half of 1992. In July 1992 mortality rates of 50 times normal were recorded in Walda camp, as well as a pronounced scurvy problem. Similar results were found in surveys in Liboi and Ifo camps. The August prevalences of wasting in camps in Mandera was 46% with 15% severe wasting. Scurvy cases were beginning to appear in the camp in November. In October mortality rates of 8–10 times normal were still being recorded in Hagadera and El Wak camps and scurvy cases were frequently being seen at health centres. The main cause of this emergency was a lack of food for the general ration exacerbated by the clan based distribution system resulting in unfair distributions. Shortage of water was also a problem for many refugee camps. By early 1993, the refugee population was reported to have risen to over 600,000.





Kenya

The situation began to improve dramatically in February 1993, as provision of food aid to the camps improved, and as some spontaneous and organized repatriation to Somalia reduced the refugee numbers to 360,000 by October 1993. Surveys at the beginning of 1994 found low levels of wasting and mortality among refugees in the previously worst affected camps. In January 1994, in Mander mortality rates were recorded at 0.59/10,000/day (2 x normal) while in Hagadera camp levels of 0.46/10,000/day (1.5 x normal) with only 6% wasting were found.

By June 1994 there were only 220,000 Somali refugees in Kenyan refugee camp, with sufficient food stocks in the country to provide an adequate general ration. Nutrition conditions were generally good, and supplementary feeding programmes could be discontinued in most camps. However, seasonal shortage of fruit and vegetables has reportedly led to reemerging scurvy.

The situation in Northern Kenya illustrates, again, that even under difficult conditions malnutrition and mortality can be controlled, but the long time taken did mean that there were many preventable cases of malnutrition

and avoidable mortality.

## Summary for Sub-Saharan Africa

The information, reported by many agencies and organizations and brought together in the Refugee Nutrition Information System reports, provides an extensive set of data which can be used to draw some summary conclusions about the situation over the period October 1992 through September 1994. Since the reports are only in part from surveys, and come in as they are available rather than in any systematic way, the results must be interpreted with caution, and certainly not as if they are representative of the entire situation. Moreover, in some cases there are reports of food availability, in others malnutrition, or mortality rates; only sometimes is more than one of these available for the same place and time. The results discussed below are usually at the level of camp (or area) and time period, usually month. Three indicators chosen for the summary are food availability, expressed as *kcal/caput/day*, which usually refers to that supplied as food aid not including any that may be available locally (which is often rather limited or nonexistent). Second, prevalences of wasting in young children (usually under five years) are reported, mainly from surveys but sometimes from clinics, generally as a prevalence of less than  $-2$ SDs weight-for-height, or less than 80% weight for height. Thirdly, crude mortality rates are fairly widely estimated, more often from registration or "body counts", but sometimes from interview in sample surveys. In this summary, these three indicators are looked at first descriptively, showing the means and ranges; and then certain associations are briefly examined.

The range of food availability reported for nine situations is shown in Figure 13a, from 115 reports. This emphasizes the wide range of calorie availabilities reported, with an average around somewhere between 1,500 and 2,000 *kcal/caput/day* in most situations. However, the spread of reported availabilities is very large, and significant numbers of reports are below 1,500, or even 1,000 *kcal/caput/day*. As noted in the box earlier, for guidance, around 2,000 *kcal/caput/day* approximates to the usual requirement. While it is certainly the case that some of the lower reported values are underestimated, being supplemented by local food, nonetheless in many of these the low figures do indeed mean that the food availability is far below that required for health, activity, and maintaining nutritional status.

The prevalences of wasting among young children in the refugee populations, primarily from surveys, are shown in Figure 13b. It can be seen that there are substantially more reports available ( $n = 298$ ). Bearing in mind that the usual level of wasting in African populations is around 5%, sometimes rising to 10 or 15% in times of severe food crisis as in droughts, the prevalences in the figure show a shocking level of malnutrition. Indeed, these are likely to be far the highest levels of wasting in Africa ever reported. Individual cases have received quite wide recognition, both in the literature and the press – Somalia for example – but the widespread high levels of wasting are very striking. Levels ranging up to 50% are common in many of the situations – Angola, Liberia, Rwanda/Burundi, Somalia, etc. – and in Southern Sudan a number of reports have been even higher. It is significant that in Mozambique, widely recognized as a well-controlled situation for the most part, levels of wasting are around normal. The risk of mortality involved with wasting is well known, and indeed can be demonstrated from these data, as discussed below in the context of Figure 16.

Mortality rates are also quite widely reported, and require some care in the interpretation. Crude mortality rates, that is the total number of deaths per population per year, tend to be around ten per 1,000 per year, in both developed and developing countries – the similarity is due to the very different age structures between these two. This translates to around 0.3/10,000/day. The reported mortality rates as shown in Figure 13c are almost all far above this normal level, which would hardly be distinguishable from zero in the diagram. Therefore these mortality rates are overwhelmingly excess mortality, hence potentially preventable. Another way of getting a sense of scale is to consider that a normal crude mortality rate (10/1,000/year) is equivalent to 1% of the population per year. Thus at 3/10,000/day, 10% of the population would die during the course of the year; at 15/10,000/day, half the population would die in the course of a year. A number of the reported mortality rates are indeed getting up to the level at which 50% of the population would die during the year. As has been noted elsewhere, for example in Somalia and Rwanda, these are some of the highest mortality rates ever recorded. But striking also from Figure 13c is that greatly raised mortality is so common as to be almost usual among these populations.

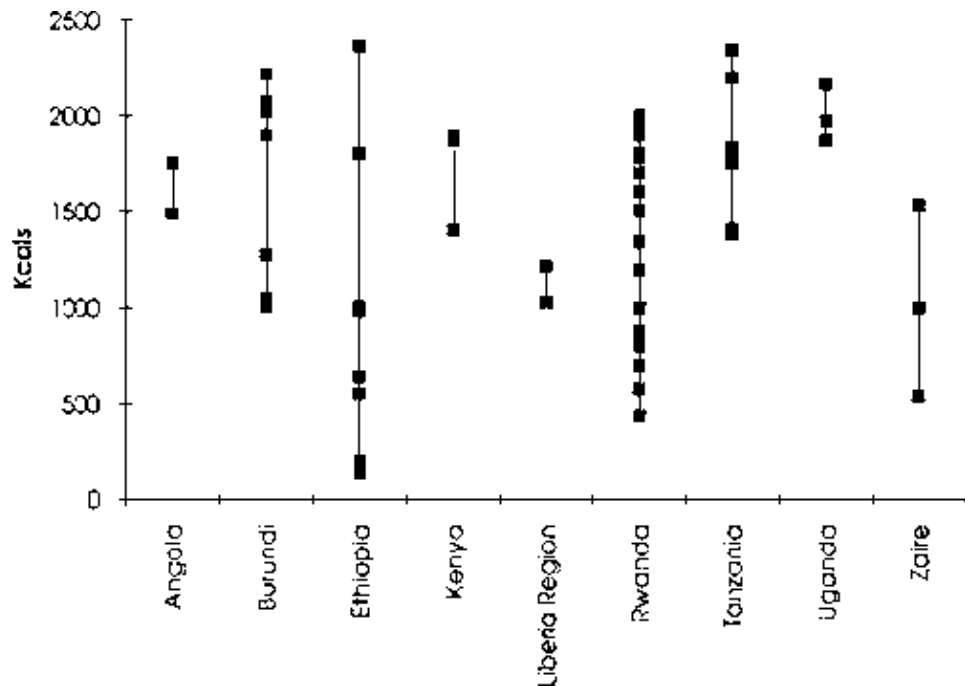


Figure 13a. Kcal Availability Amongst Refugee and Displaced Populations in Africa.

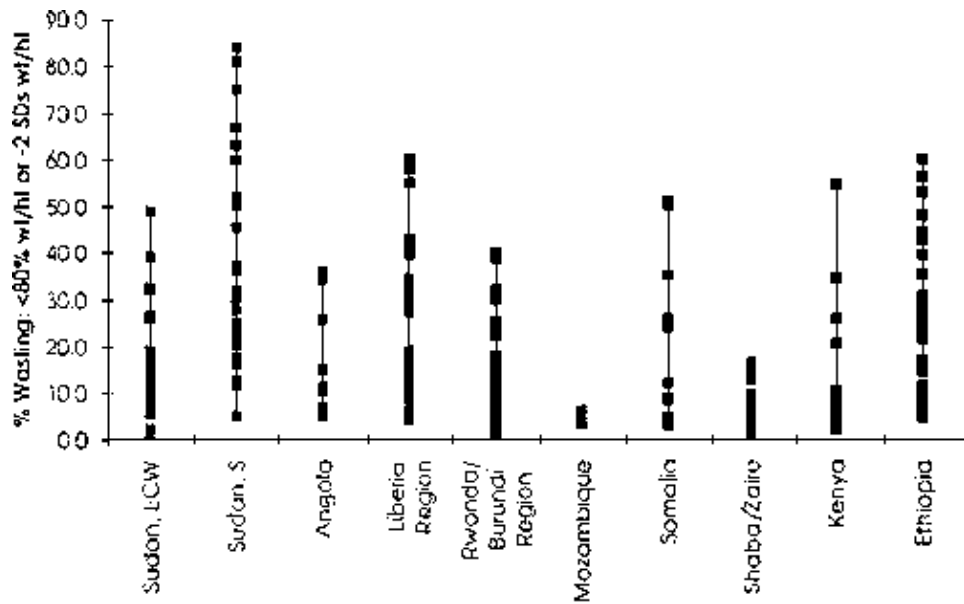


Figure 13b. Wasting Amongst Refugee and Displaced Populations in Africa, Oct 92 – Sep 94

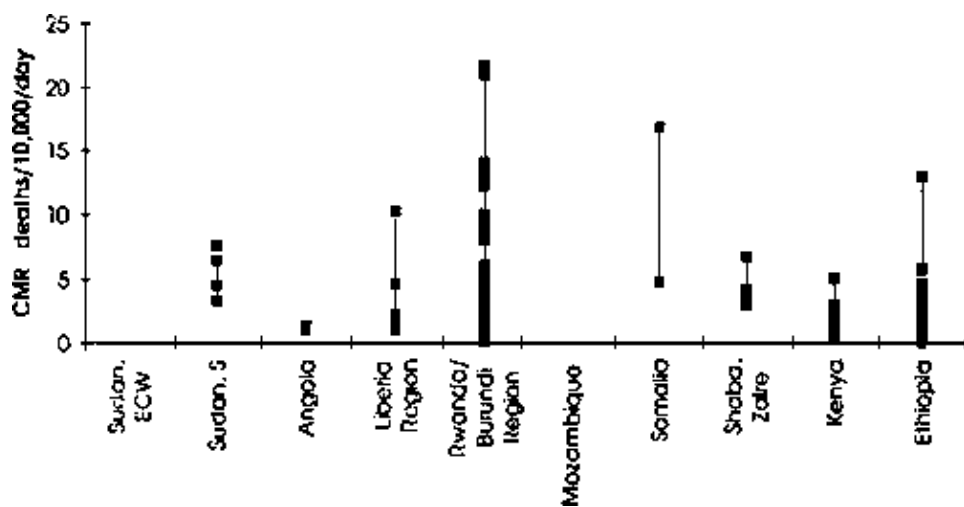
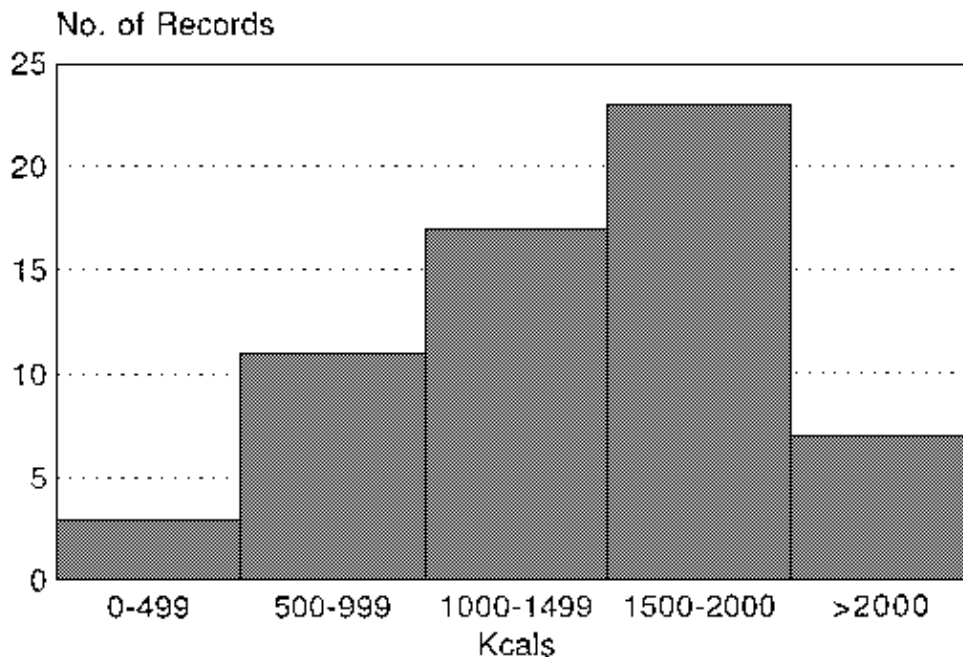


Figure 13c. Mortality Rates Reported Amongst Refugee and Displaced Populations in Africa, Feb 92 – Sep 94

Going back to the distribution of food supply, in Figure 14 the number of cases falling into ranges of calorie availability are shown. This is a different way of presenting the data shown in Figure 13a, and reemphasizes that at least half of the reports are of food availabilities less than 1,500 kcals/caput/day, well below adequacy, a level at which it is almost inevitable that people will be hungry and that their nutrition will deteriorate. In fact, there are significant numbers of reports of below 1,000 kcals/caput/day being available, and other information indicates that in most of these the deficit is not made up by locally available food. It should be stressed that these reports indicate major problems of logistics and accessibility, and do not imply a lack of effort to supply adequate food. The distribution also demonstrates that shortfalls in food supply are not a matter of a few hundred calories. Attempts to more closely define requirements risk obscuring the scale of the deficits that need to be met. The issue is not whether the target should be 1,900 or 2,100 kcals/caput/day, in the first instance, but whether anything near adequacy can be achieved.

For the relatively fewer cases (n = 48) in which mortality and food supplies are available for the same place and time, the association is shown in Figure 15. Here it is striking that the very high mortality rates are associated with calorie availabilities of less than 1,500, and indeed in those cases where more than 2,000 kcals/caput/day are available, the mortality rates are on average less than 1/10,000/day, and do not reach 2/10,000/day. This diagram shows the means and the ranges, and while only having relatively small numbers of data points, seems likely to be reflecting reality. It should of course be stressed that although there is obviously reason to suppose that low calorie availability contributes causally to mortality, this is not proved by these data, and the interpretation is that situations with low calorie supply are those with high mortality. Whilst it is likely that improving the food availability would contribute to reducing mortality, health and other factors no doubt play an important role, and the association should not be overinterpreted.



**Figure 14.** Numbers of Records and Kcals Supplied (records are individual reports from camps)

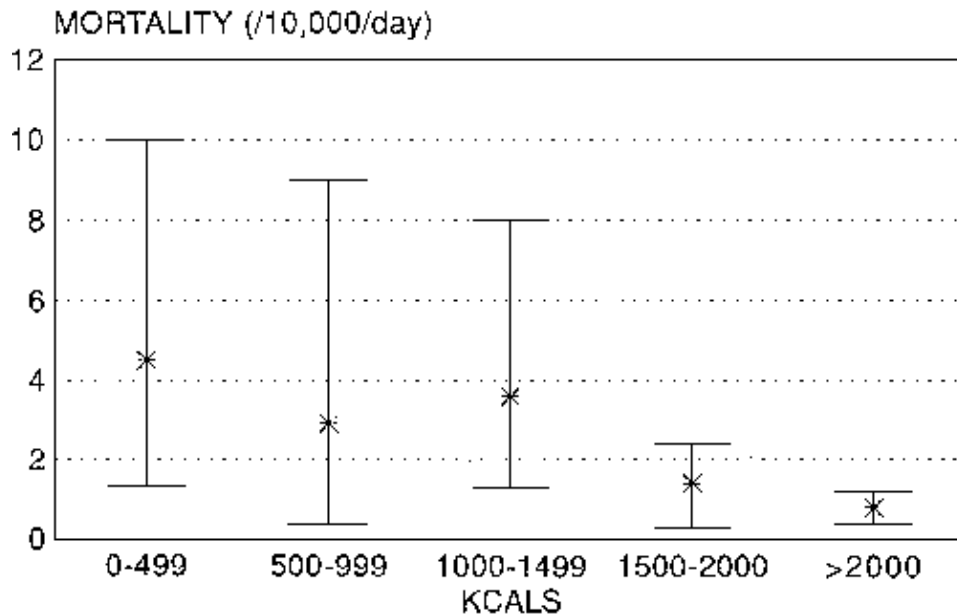


Figure 15. Mortality Range, mean (x), and Kcals Supplied

Source: ACC/SCN (1993/4), RNIS.

Two data points omitted because they are off the scale are as follows: MR of 30 and Kcal <400 and MR of 23 and Kcals 1000–1499, from Goma.

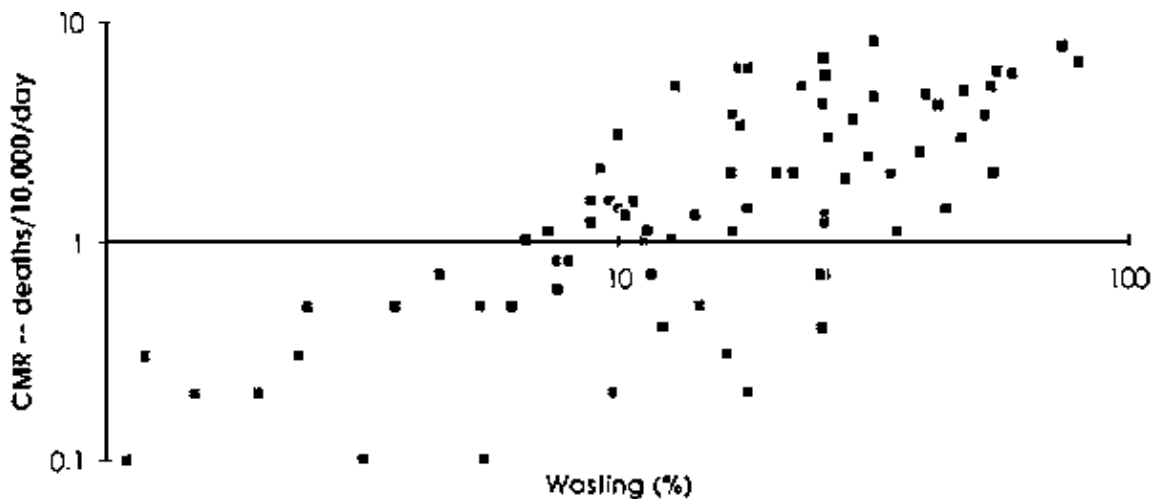


Figure 16. Wasting vs Mortality in Refugee and Displaced Populations in Africa

Regression Line Statistics.

$$\text{Log CMR} = A + B(\text{LogWasting})$$

Intercept (A) = -2.05 (t = -8.78, p<0.000)

Coefficient (B) = 0.875 (t = 10.6, p<0.000)

R<sup>2</sup> = 0.59. n = 80

Source: ACC/SCN (1993/4), RNIS.

When prevalences of wasting are compared with reported mortality, as shown in Figure 16, again the expected situation is observed, but the closeness of the association is striking. The figure uses log-scales for both mortality and wasting, and the association is quite strong, as shown in the statistics under the figure. The crude mortality rate of 1/10,000/day, although elevated, is often taken as a cut-off to define a crisis situation. It is of interest that very few situations with wasting levels of less than 10% show a crisis level of mortality by this definition. In fact, it can be calculated (results not shown here) that a good degree of prediction of mortality exceeding 1 or 2/10,000/day can be obtained using cut-offs of wasting of 10 to 20% (optimum around 15%). It should be noted that the measurements here are simultaneous whereas clearly wasting is

expected to predict mortality over time; however this time period is quite limited, and simultaneous measurement does not invalidate the conclusion. It does mean that wasting can be used as a reasonable estimate of mortality risk, and that situations with over 10% of wasting in young children should be taken as likely to be critical. Turning back to Figure 13b, this demonstrates that most of the situations are indeed critically in need of additional inputs.

\* \* \*

Widespread severe malnutrition and high risk of dying are evidently common amongst the refugee and displaced populations in Sub-Saharan Africa. Whereas famine risk has receded in all other regions, in Africa it has shifted towards these populations – almost always generated by conflict – now well outnumbering those affected by famine triggered by drought.

The numbers affected, around 20 million, are rising steadily (see Figure 3) on average, with major shifts in pattern as crises erupt and recede. The malnutrition and mortality can be controlled, and demonstrably are, with external assistance. There are several recent examples, from the interventions to control the cholera and dysentery among Rwandans in Goma, to the long-run general success in protecting nutrition for Mozambican refugees. Part of the urgency is to more rapidly achieve this control, at least when the uprooted are in contact with assistance, when they have fled to relatively safe areas where agencies can operate.

Episodes like the Rwandan crisis can be seen as a possible early warning of even worse to come. Many populations in Sub-Saharan Africa are vulnerable to ethnic conflict, some of which persists for years, liable to flare-up into full-scale war. Several such populations number in the tens of millions, and even more massive refugee flows than have been seen recently could occur, bringing famine on a wide scale. The future nutritional situation in many parts of Sub-Saharan Africa may depend, more than anything, on whether these conflicts are dampened down, or whether they explode.

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## C. General Data

### (Country Case Study Panels)

Population	IMR, Underweight Preschool Children	UNICEF (1993). <i>Child Malnutrition: Country Profiles</i> . Statistics and Monitoring Section. Planning & Coordination Office. UNICEF, New York.
Economics	GDP per capita (local currency)	WB (1994). <i>World Tables, Fall 1994 Update</i> . Washington, D.C. (Computer Disk).
	Debt Service Ratio	WB (1994). <i>World Debt Tables, 1993–94</i> . Washington, D.C. (Computer Disk)
	Consumer Price Index	UN (1993/94). <i>Monthly Bulletin of Statistics</i> . Various Issues. UN, New York.
	Food Price Index	UN (1993/94). <i>Monthly Bulletin of Statistics</i> . Various Issues. UN, New York.
	Health Expenditure	IMF (1994). <i>Government Financial Statistics</i> . IMF, Washington, D.C.
	Education Expenditure	IMF (1994). <i>Government Financial Statistics</i> . IMF, Washington, D.C.
	Real GDP per capita (PPP \$) 1991	United Nations Development Program (1994). <i>Human Development Report 1994</i> . Oxford University Press, New York.
Food, Agriculture	Food Production Index	FAO (1994). <i>AGROSTAT-PC: FBS Domain</i> . FAO, Rome. (Computer Disk)
	Dietary Energy Supply	FAO (1994). <i>AGROSTAT-PC: FBS Domain</i> . FAO, Rome. (Computer Disk)
Health	Immunization Coverage	World Bank (1994). <i>Social Indicators of Development 1994</i> . World Bank, Washington, D.C. (Computer Disk).
	Access to Local Health Care	WHO (1992). <i>Health for All Database</i> . WHO, Geneva. (Computer Disk)  World Bank (1994). <i>Social Indicators of Development 1994</i> . World Bank, Washington, D.C. (Computer Disk).

## D. Anthropometric Data

<sup>1</sup> Additional to sources given in the Second Report on the World Nutrition Situation, Volume II, p.128–133

Bangladesh	(1990 – 1993)	Bloem, M. (1994), HKI/IHPN (1990–1994). <i>Nutritional Surveillance</i> . Various Reports, 2–Monthly. HKI/IHPN, Dhaka.
Brazil (NE)	(1989)	Monteiro, C., Benicio, M., Iunes, R., Gouveia, N., Taddei, J. & Cardoso, M. (1992). Nutritional Status of Brazilian Children: Trends from 1975 to 1989. <i>Bull WHO</i> , <b>70</b> (5), 657–666.
Brazil (NE)	(1992)	Victora, C., Barros, F., Horta, B. & Cesar, J. (1993). <i>Saude E Nutricao das Crianças Nordestinas. Pesquisas Estaduais 1987–1992</i> . UNICEF/Universidade Federal de Pelotas, Brazil.
China	(1990)	Shen, T., Chang, Y., He, W., Jiang, T., Xian, Z. & Yang, Y. (1992). <i>Development in China as Reflected in Child Well Being: Information from Chinese Nutritional Surveillance</i> . Chinese Nutritional Surveillance Program. Monograph No.7, Beijing.
Costa Rica	(1992)	Ministerio de Salud (1992). <i>Analisis del Estado Nutricional de la Poblacion Costarricense 1992</i> . Departamento de Nutricion y Atencion Integegral. Seccion Vigilancia Nutricional, Ministerio de Salud, San Jose.
Egypt	(1992)	Egypt National Population Council & DHS/Macro International Inc. (1993). <i>Demographic and Health Survey 1992</i> . Macro International Inc., Calverton, MD.
Ethiopia	(1993)	Transitional Government of Ethiopia, Central Statistical Authority (1993). Report on the Rural Nutritional Survey, Core Module. <i>Statistical Bulletin No.113</i> Transitional Government of Ethiopia, Addis Ababa.
India	(1991/2)	National Nutrition Monitoring Bureau (1993). <i>Report for 1991–92</i> . National Institute of Nutrition, Indian Council of Medical Research, Hyderabad.
Kenya	(1993)	National Council for Population and Development (NCPD), Central Bureau of Statistics (CBS) & DHS/Macro International Inc. (1994). <i>Kenya Demographic and Health Survey 1993</i> . Macro International Inc., Calverton, MD.
Madagascar	(1992)	Centre National de Recherches sur l'Environnement, Ministere de la Recherche Appliquee au Developpement & DHS/Macro International Inc. (1994). <i>Enquete National Demographique et Sanitaire 1992</i> . Macro International Inc., Calverton, MD.
Malawi	(1992)	National Statistical Office & DHS/Macro International Inc. (1994). <i>Malawi Demographic and Health Survey 1992</i> . Macro International Inc., Calverton, MD.
Morocco	(1992)	Azelmat, M., Housni, El A. & Ayad, M. (1993). <i>Fertility, Family Planning, and Maternal and Child Health. Results of the ENPS–II, Morocco, 1992</i> . Ministere de la Sante Publique, Service des Etudes et de l'Information Sanitaire, Rabat.  Ministere de la Same Publique, Secretariat General–DPSI, Service des Etudes et de l'Information Sanitaire & DHS/Macro International Inc. (1993). <i>Enquete National sur la Population et la Sante (ENPS–II) 1992</i> . Macro International Inc., Calverton, MD.
Nicaragua	(1993)	World Bank (1994). <i>Nicaragua Poverty Profile, Consultative Group Meeting for Nicaragua, June 1994</i> . 1993 Living Standards Measurement Survey. World Bank, Washington, D.C.
Panama	(1992)	Ministerio de Salud de Panama, Departamento de Nutricion y Dietetica (1992). <i>Encuesta Nacional de Vitamina A, 1992</i> . Ministerio de Salud, Panama.
Philippines	(1992)	Food and Nutrition Research Institute, Department of Science and Technology (1993). <i>1992 Update on Nutrition Situation of Filipino Children</i> . FNRI, Manila.
Rwanda	(1992)	

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## Annex I Methods Used for Calculating Economic Growth Rates

<sup>1</sup> Prepared by Dr Howarth Bouis, IFPRI

Gross Domestic Product (GDP) measures the total output of goods and services for final use produced by residents and nonresidents. Gross National Product (GNP) is GDP plus net factor income from abroad, which is the income residents receive from abroad for factor services (labor and capital) less similar payments made to nonresidents who contributed to the domestic economy (World Bank, 1994). This correction for net factor income from abroad is typically a small percentage of GNP, so that GDP and GNP are usually highly correlated.

Data for per capita GDP in local currency corrected for inflation (in this case expressed in 1987 currency) are used in the analysis in Chapter 1. Data for per capita GNP expressed in US dollars at official exchange rates were also available for use in this analysis. However, official exchange rates may change abruptly from one year to the next, depending among other things on shifts in government monetary policy, with no comparable abrupt shift in the underlying welfare (real income) of the population.

In order to provide comparability across countries in absolute income levels, estimates of GDP calculated using purchasing power parities (PPP) are given accompanying the individual country charts in Chapter 2. The use of official exchange rates to convert the national currency figures to US dollars does not attempt to measure the relative domestic purchasing powers of countries (e.g. the cost of comparable housing in two countries expressed in US currency may be quite different). The United Nations International Comparison Project (ICP) has developed measures of real GDP on an internationally comparable scale using purchasing power parities instead of exchange rates as conversion factors (UNDP, 1993).

The growth rate for Gross Domestic Product (GDP) was calculated (described in Gujarati (1988), p.147–150) by estimated the following regression using ordinary least squares:

$$\ln \text{GDP} = a_1 + a_2 T$$

Where T is a time trend, the estimated coefficient  $a_2$  measures the instantaneous growth rate.

Because this method takes into account all observations in a period, the resulting growth rates reflect general trends that are not unduly influenced by exceptional values, particularly at the end points (World Bank (1994), p.306). An implication of using this technique is that the growth rates calculated for two consecutive sub-periods may not bracket the growth rate calculated for the longer time period covering both sub-periods.

While it may seem counter-intuitive, at first, that the growth rate for the longer period is not a weighted average of the two sub-periods, conventionally-estimated compound growth rates between two points in time (which ignore observations between these two points), may simply be a function of a large deviation from trend of GDP in the first or last year of the period, which is not reflective of the underlying potential for higher income to improve nutrition. To take a hypothetical example, suppose that GNP for 1985-90 is 100, 100, 100, 100, 100, 127.63. A straight calculation of the growth rate between the two points for 1985 and 1990 gives a 5.0% per year growth. However, fitting a regression line through the data (using the methodology described above) gives a 3.55% growth. In this hypothetical situation, if growth had been a steady 5.0% over the entire period, one could imagine a substantial improvement in anthropometry. However, nutrition improvement might not have shown up at all given the uneven way that growth occurred. Thus, 3.55% would probably be a better number to use in the analysis of effects of income growth on improved anthropometry.

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## Annex II List of Countries Included in Reports on the World Nutrition Situation and Updates

### Sub-Saharan Africa

Angola	Displ94
Benin	U89
Botswana	U89
Burundi	Displ94
Burkina Faso	U89
Cameroon	
Central African Republic	
Chad	U89
Congo	
Côte d'Ivoire	
Ethiopia	U89, Displ94, U94
Gambia	U89
Gabon	
Ghana	U89
Guinea	Displ94
Kenya	2RWNS, Displ94, U94

Lesotho	U89
Liberia	Displ94
Madagascar	U89, U94
Malawi	U94
Mali	U89
Mauritius	
Mauritania	U89
Mozambique	Displ94
Niger	U89
Nigeria	2RWNS
Rwanda	U89, Displ94
Senegal	U94
Sierra Leone	Displ94
Somalia	Displ94
Sudan	U89
Swaziland	
Tanzania	U89, 2RWNS, IUNS93
Togo	U89
Uganda	
Zaire	Displ94
Zambia	U94
Zimbabwe	2RWNS, IUNS93

***Near East and North Africa***

Algeria	
Cyprus	
Egypt	2RWNS, U94
Iraq	Displ94
Jordan	
Kuwait	
Lebanon	
Libya	
Morocco	U94
Saudi Arabia	
Syria	
Turkey	

Tunisia Trend94

United Arab Emirates

Yemen

**South Asia**

Afghanistan Displ94

Bangladesh U89, 2RWNS, Displ94, U94

India 2RWNS, IUNS93, U94

Iran

Nepal Displ94

Pakistan 2RWNS

Sri Lanka U89

**South East Asia**

Indonesia U89, 2RWNS, IUNS93

Kampuchea

Laos

Malaysia Trend94

Myanmar Trend94

Papua New Guinea

Philippines U89, 2RWNS, U94

Thailand U89, 2RWNS, IUNS93

Vietnam Trend94

**China** U89, 2RNWSVoll, U94

**Middle America and Caribbean**

Costa Rica U89,  
U94

Cuba U89

Dominican Republic

El Salvador Trend94

Guatemala U89

Haiti

Honduras

Jamaica U89

Mexico 2RWNS

Nicaragua U89

Panama Trend94



**South America**

Argentina

Bolivia U89

Brazil 2RWNS, IUNS93, U94

Chile U89

Colombia U89, 2RWNS

Ecuador

Guyana

Paraguay

Peru U89, Trend94

Uruguay U89

Venezuela U89

**Key:**

U89:	Case-study in Update on the World Nutrition Situation, 1989
2RWNS:	Case-study in Second Report on the World Nutrition Situation, Volume II, March 1993.
IUNS93:	Case-study presented at XV Congress of IUNS, Adelaide, 1993 (available from ACC/SCN).
Displ94:	Information on refugees and displaced people in this report, Chapter 3.
U94:	Case-study in this report, Chapter 2.
Trend94:	Trend only available, in this report, Table 1.

*Note:* These 93 countries (grouped thus) have been included in the First and Second Reports on the World Nutrition Situation (Table 3, p45 in First Report, Second Report Vol I, Fig 1.1, p5), giving data comparable through time at country-group level. This table is included to show in which reports case-study descriptions are available.

