

# **Explaining Success in Reducing Under-Nourishment Numbers in Ghana**

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Numbers in Ghana**

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**Abstract**

The FAO Food Security measure shows that the number of under-nourished Ghanaians has fallen from 64 to 12 percent between 1979-1981 and 1998-2000. The paper shows that most of the increase in the DES was explained by an expansion in maize, cassava, yam and plantain production. The production increase was mostly due to acreage expansion which in turn can be attributed to the improved economic environment and market access for farmers. Improved varieties did help raise yields for maize and cassava quite substantially and helped raise output, particularly in the 1990s. Much of the reduction in under-nourishment was driven by increased cassava production and we note that a break in the series in 1991 makes comparison between 1979-1981 and 1998-2000 prone to error.

The reduction in hunger was driven by economic growth which raised the incomes of many Ghanaians. In particular public sector and private formal sector employees and export farmers benefited from the complete turnaround in the macroeconomic environment and performance. Fundamentally this turnaround could not have happened without the political will to implement policies that were economically painful for many Ghanaians and which met with significant political opposition.

Other indicators of food-poverty and under-nutrition suggest that while Ghana made progress in reducing hunger the achievements have not been as spectacular as indicated by FAO's measure of under-nourishment. Or, to turn this around, the evidence would suggest that food availability is no longer the key constraint. Rather the focus must be targeted at the lack of access to food by particular occupational groups such as food farmers and in particular regions, such as the Upper East and Upper West regions. Furthermore, the anthropometric data indicate that targeted interventions at, for example, mother's education and nutritional status, are required.

**Key Words:** Food Security, Ghana, Staple Foods, Cassava, Food availability, Under-nourishment

**JEL:** O5, I3, Q1

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## Introduction

At the 1996 World Food Summit (WFS) 185 participating countries and the European Union committed themselves to halving the number of under-nourished by 2015. Since that time the Food and Agriculture Organization of the United Nations, in an effort to monitor progress, regularly generates estimates of the number of people that are under-nourished, i.e. chronically food insecure.<sup>1</sup>

It is now apparent that trends in under-nourishment vary, often widely, across countries. Some countries, such as Ghana, have done extremely well. Estimates published in *The State of Food Insecurity in the World 2002* (FAO, 2002) suggest that the proportion of under-nourished in Ghana fell by over 50 percent during the 1979/1981 to 1996/1998 period (figure 1).<sup>2</sup> While not directly comparable the most recent estimates for 2000-2002 confirm this trend (FAO, 2005).<sup>3</sup> This is the largest drop experienced by any developing country over the last two decades.

This observation is important since, at current rates of progress, the WFS target cannot be met. Success in some countries gives hope, also because their success may hold important lessons for countries which have experienced little change or even worsening conditions. In this paper we assess the underlying factors that have driven the reduction in under-nourishment, as measured by the FAO measure of food security (FAO-FS). We also consider to what extent the FAO-FS can serve as a reliable indicator of under-nourishment, at least in the case of Ghana. Finally we consider what possible lessons Ghana's experience may hold for countries in which under-nourishment continues to be an obstacle to human and economic development.

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### Box 1

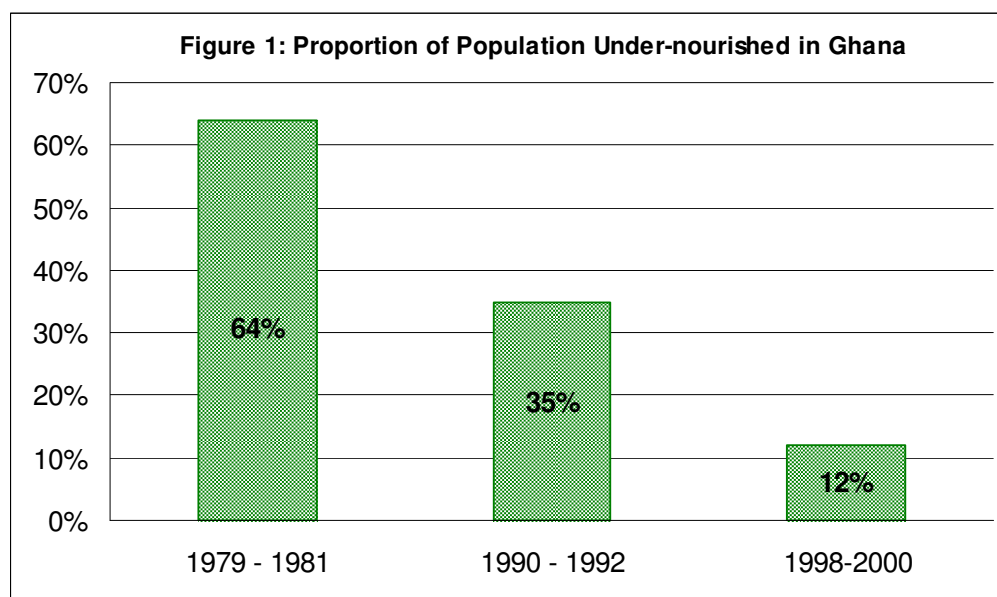
Ghana is located on the West coast of Africa and has a total land area of 238 300 km<sup>2</sup>. The population, 41 percent of which are under the age of 15, was estimated at about 21.3 million in 2004. Ghana, which ranks 138<sup>th</sup> in the Human Development Index of the UNDP (2004), is a low-income food-deficit country with a per-capita income (GNI) of less than US\$ 380, slightly below the sub-Saharan Africa average. The country enjoys relatively high levels of natural resources, including arable land, forests and mineral deposits. About 70 percent of the labour force is employed in agriculture which accounts for about 40 percent of the GDP and over 50 percent of foreign exchange earnings. For maps on rainfall, population density, district boundaries, etc. visit FAOMAP at <http://apps3.fao.org/faomap/>. Country specific data and information is also available from the FAO Country Profiles and Mapping Information System at [www.fao.org/countryprofiles](http://www.fao.org/countryprofiles).

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<sup>1</sup> Under-nourishment is defined as that level of food intake below which dietary energy requirements are not met on a continuous basis. Country level estimates of the proportion of the total population which is under-nourished are published annually by FAO in *The State of World Food Insecurity* ([www.fao.org/sofi](http://www.fao.org/sofi)).

<sup>2</sup> The estimates are three year averages.

<sup>3</sup> The *SOFI 2005* estimates for 1990-1992 and 1998-2000 are 37 and 13 percent, respectively.



Source: FAO, *The State of Food Insecurity (2002)*.

We turn first to the factors directly impacting on the FAO-FS measure. That is followed by a discussion of more general factors, such as the economic and political environment and their role in improving the food security situation. Finally we contrast the FAO-FS to related indicators of food poverty as well as measures of welfare related to nutritional status.

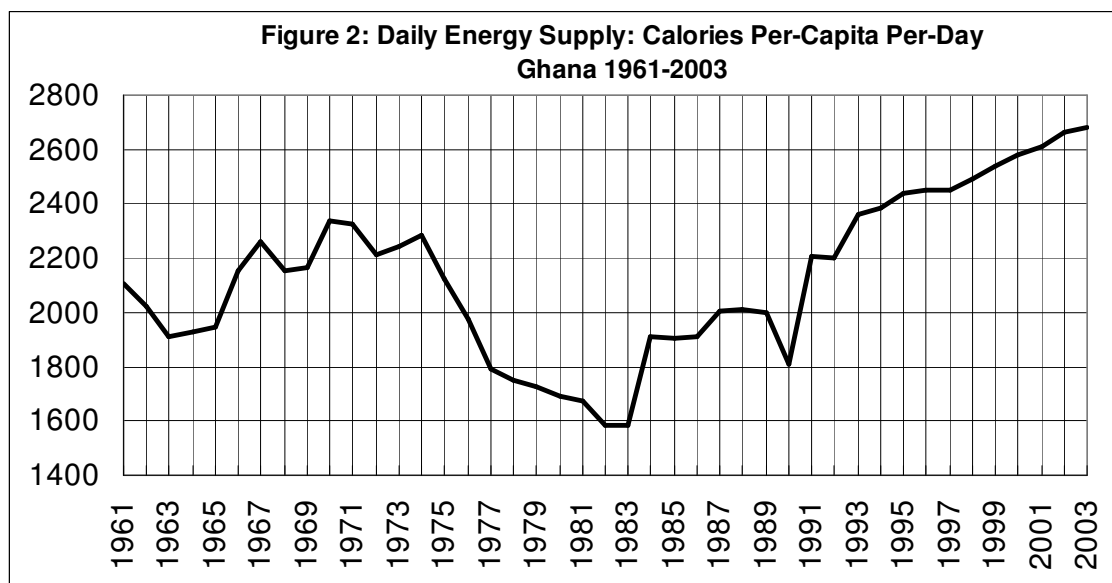
## The FAO Measure of Food Security

The FAO methodology for estimating the prevalence of under-nourishment consists of a frequency distribution of food consumption (expressed in terms of dietary energy) and a cut-off point for intake inadequacy defined on the basis of minimum energy requirement norms. Dietary energy supply – or DES - is a function of total food supply, i.e. domestic production, imports, food aid and change in stocks. The total food supply is converted into kilocalories/person/day, after adjusting for the age and gender composition of the population (when reporting DES data we omit reporting the units each time). Economic access to food is incorporated into the measure by using information on the inequality of the income distribution.<sup>4</sup> Since the measure of inequality is assumed not to have changed over the period under consideration we focus on food availability as the direct explanatory variable for the falling prevalence of under-nourishment.<sup>5</sup>

<sup>4</sup> For a detailed discussion of FAO's methodology see Naiken (2002). FAO has held an "International Scientific Symposium on the Measurement and Assessment of Food Deprivation and Undernutrition (ISS)" further details of which are available at: <http://www.fivims.net/index.jsp>.

<sup>5</sup> Naiken (2002). Available evidence would suggest that this is a reasonable assumption for Ghana. According to GLSS data there has been very little change in the income distribution over the 1990-98 period (GSS, 2000) at the national level. Data on consumption inequality for 1992 and 1998 also shows little change (Christiaensen, Demery and Paternostro, 2002). Ghana has a relatively equal income distribution, among sub-Saharan African countries, with an average (1988-2002) Gini coefficient of 0.35 (IMF, 2000). In contrast Maxwell et al (2000) report a Gini coefficient for households in Accra of 0.43 for 1987-88 and 0.5 for 1992 (GLSS data).

Figure 2 and Table 1 show that the availability of calories per-capita per-day, or DES, fell from about 2280 kcal/cap/day in 1969-71 to a low of 1600 in 1983. It then rose sharply in 1984 but remained in the 1900-2000 range until 1990.<sup>6</sup> Only in 1991 did DES rise significantly, reaching 2200. The remainder of the 1990s has seen a steady rise in the supply of DES, reaching 2700 by 2003.



Source: FAOSTAT – Food Supply

Two aspects are relevant: first, the rapid decline of DES in the 1970s and, second; although the recovery started in 1983 it has been the post 1990 increases in DES that have driven the drop in the prevalence of under-nourishment. Below we consider what role food aid and imports had in the recovery of DES. The discussion is limited to cereals as imports/food aid of roots and tubers are virtually nil.

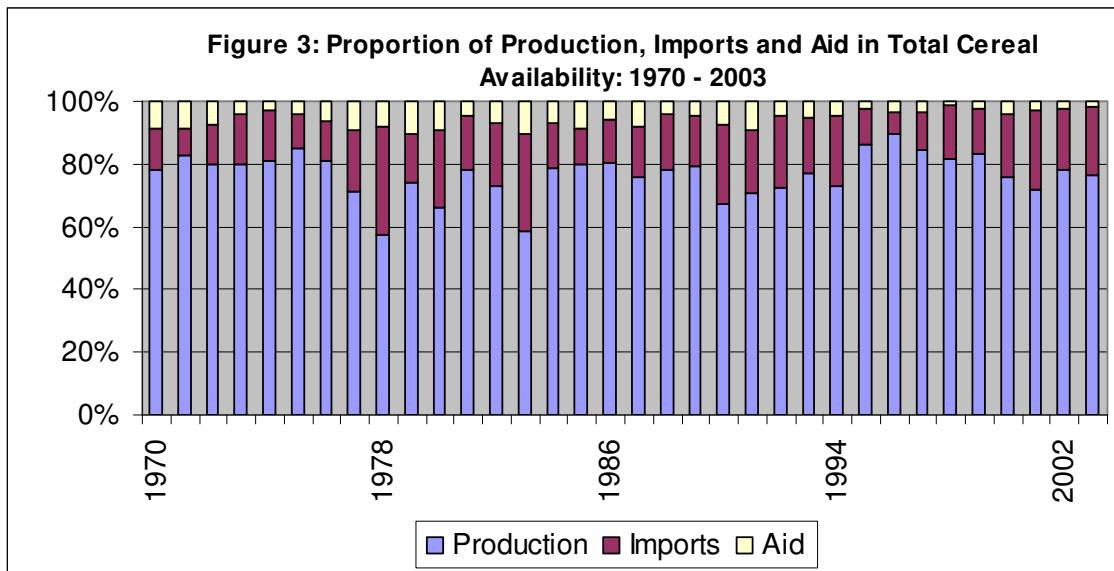
	1969 - 71	1979 - 81	1989 - 91	2000 - 02
<b>Cereals</b>	597	490	618	750
Maize	306	220	306	337
Rice	72	62	109	200
Millet	82	60	47	46
Sorghum	79	71	68	74
<b>Starchy Roots</b>	905	615	778	1129
Cassava	386	372	479	637
Yams	281	129	163	320
<b>Fruit</b>	223	166	150	244
Plantains	205	155	144	229
<b>Total</b>	2278	1696	2006	2619

Source: FAOSTAT – Food Balance Sheets

<sup>6</sup> Data on DES and the breakdown of DES by crop are available from FAO's web pages ([www.fao.org](http://www.fao.org)) under FAOSTAT.

## Food Imports and Aid (Cereal)

Cereal imports and food aid averaged 256 000 and 77 000 tons<sup>7</sup> respectively between 1970-2000. Food aid remained relatively stable in this period, except for a sharp rise in 1991, with a steady decline apparent after 1993.



Source: FAOSTAT

Cereal imports are generally more significant except for a short period in the mid-1990s which saw imports fall, in proportion to domestic production. If we compare the ratio of imports plus aid to production for the three-year periods for which we have the under-nourishment data we note that these were about 0.4 in 1979-81 and 1990-92 but below 0.3 in 1998-2000. Imports and food aid are important, but their weight in food availability has declined (even more true if we also consider roots and tubers) and their trend runs counter the trend in under-nourishment. We therefore turn to food production to explain the changes in the DES and the numbers of under-nourished.

## Food Production

Following independence in 1957 the government of Ghana, under Kwame Nkrumah, aimed at increasing food production through modernised, capital-intensive agricultural systems using state farms. Despite the heavy investments made, the state farms failed, mainly as a result of poor farm management practices and weak institutional support. Post Nkrumah governments continued to involve the state in direct production, with little apparent success. Subsidies were grossly abused, while the smuggling of subsidized agricultural produce to neighbouring countries was widespread.<sup>8</sup>

Table 2 shows that per-capita food production fell steeply in the 1970s. The particularly disastrous performances in 1979 and 1983 was due to below average

<sup>7</sup> Tons are always metric tons in this text.

<sup>8</sup> See Dapaah (1995) for more detail.

rainfall/drought.<sup>9</sup> Starting in 1983 agricultural output started to recover although on a per-capita basis food production was still falling. The first half of the 1990s saw average annual growth of food production of 13 percent while the second half saw continued but more moderate expansion. Per-capita levels of food production increased substantially in the 1990s although they are only now surpassing levels already seen in the early 1970s.

<b>Year</b>	<b>Food Production</b>	<b>Per-capita food production</b>	<b>Average percentage change in food production</b>	<b>Average percentage change in per-capita food production</b>
1970 - 75	46	98	2.1	-0.8
1976 - 80	39	73	-3.7	-5.8
1981 - 85	41	65	4.1	0.4
1986 - 90	51	69	0.6	-2.3
1991 - 95	72	85	13.0	10.0
1996 - 2000	92	96	4.4	2.1
2001 - 2004	113	107	5.1	2.9

Source: FAOSTAT

Growth in food production was aided by adequate rainfall in 1984 and above average rainfall in 1989-93. Some authors go so far as to put most of the increased production down to improved rainfall while others point to parallel programs, in particular Sasakawa Global 2000's credit program, by non-governmental organizations (Tripp, 1993).<sup>10</sup>

<b>Crop</b>	<b>1979 - 81</b>	<b>1989 - 91</b>	<b>1998 - 2000</b>	<b>2002 - 04</b>
Cassava: mt/capita	0.17	0.26	0.40	0.47
Maize: mt/capita	0.03	0.05	0.05	0.06
Millet: mt/capita	0.01	0.01	0.01	0.01
Plantains: mt/capita	0.07	0.07	0.10	0.11
Rice: mt/capita	0.01	0.01	0.01	0.01
Sorghum: mt/capita	0.01	0.01	0.02	0.02
Yams: mt/capita	0.06	0.10	0.16	0.18

Source: FAOSTAT

Other possible factors that impact output levels are fertilizer and price policies. With regard to fertilizer consumption we note that this fell after 1983 when subsidies were reduced gradually until their elimination in 1990. Use of this input fell to about 7500 tons in 1984 and, with the exception of 1996-98, stayed in the 7500-13000 tons range.<sup>11</sup> Finally, price policies are not considered to be of importance in explaining productivity change as low productivity in the pre-1983 period was not

<sup>9</sup> Virtually all of Ghana's agriculture is rain-fed although perhaps 120 000 hectares are potentially irrigable. About 6 million hectares (or 0.15% of the total area under cultivation) are irrigated. 39% of this area is in the Greater Accra region while 5.5, 10.8 and 37.8% are in the Northern, Volta and Upper East regions, respectively.

<sup>10</sup> Pupilampu (1999) notes that credit repayment problems prevented SG 2000 from extending the program to other farming communities.

<sup>11</sup> Fertilizer use was/is concentrated among the larger scale cocoa farmers and by maize and rice farmers in the poorer regions (Alderman and Shively, 1996).

principally one of pricing policy. Below we turn to the key staple food crops which largely explain the rise in DES in the 1980-2000 period.

## **Cereals**

The contribution of cereals (excluding beer) to total DES fell marginally from 31 to 29 percent between 1989-91 and 1998-2000. Nationally maize is the most important cereal, contributing to just over half of the cereal component of DES. It is the most widely consumed staple in Ghana and maize and maize-based foods account for just over 10 percent of food expenditures by households (Boateng et al, 1990). In the Southern, Central and Volta regions and parts of the Northern Region, where it is the principal staple, maize contributes up to, but rarely more than 35 percent of the calories of the average household (Tripp and Marfo, 1997).<sup>12</sup> About 40 percent of cereal production is concentrated in the Northern, Upper East and Upper West Regions and maize, millet and sorghum are the predominant crops in these areas. About 60 percent of maize production is concentrated in Brong-Ahafo, Ashanti and Eastern regions (FAO, 2002). Specifically, cereal producing areas are:

- Maize: Western, Central, Eastern, Volta, Ashanti, Brong-Ahafo, Northern regions, and – to a lesser extent Upper West and Upper East regions
- Rice: Northern, Upper West, Upper East regions and - to a lesser extent - Western and Volta Regions.
- Millet and sorghum: Northern, Upper West and Upper East regions

We focus on maize production here and return to the importance of rice, millet and sorghum at a later point.

## **Maize**

Maize production increased strongly in the 1981-85 period due to acreage and yield increases (table 4). Yields had declined from an average of 1.2 metric tons/hectare (mt/ha) in the 1966-70 period to 1.0 and 0.9 mt/ha in 1976-80 and 1981-85 respectively (0.98 mt/ha if yield figures for 1983 are excluded). Yields then gradually recovered to 1.2 mt/ha in the 1986-90 period and 1.5 mt/ha in 1996-2000 and 2001-2005.

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<sup>12</sup> Tripp and Marfo (1997) find that maize typically contributes less than 20% of calories of the average diet.



<b>Table 4: Maize Production, Area Harvested and Yield</b>			
	<b>Production Million Tons</b>	<b>Area Harvested: '000 Hectare</b>	<b>Yield: Tons/Hectare</b>
1966 - 1970	0.37	309	1.21
1971 - 1975	0.42	394	1.08
1976 - 1980	0.31	307	1.02
1981 - 1985	0.44	490	0.87
1986 - 1990	0.64	518	1.22
1991 - 1995	0.92	634	1.45
1996 - 2000	1.01	681	1.49
2001 - 2004	1.20	794	1.50

Source: FAOSTAT

Using the averages reported in table 4 we find that acreage increases accounted for 44 percent of the total production increase over the 1981-85 to 1996-2000 period.<sup>13</sup> Yield increases are therefore significantly more important, accounting for about 56 percent of production increases over the twenty year period. Maize yields improved due to relatively effective development and dissemination of maize technology in Ghana despite very difficult circumstances in the 1970s. The Ghana Grains Development Project (GGDP) was launched in 1979 and led to the release of two new varieties in 1984, later replaced by versions resistant to maize streak virus. Tripp and Marfo (1997) find that the launch in 1987 of the Sasakawa-Global 2000 food project and the widespread coverage it achieved helped significantly to spread improved maize technology more widely.<sup>14</sup>

### **Roots and Tubers/Cassava and Yams**

The contribution of starchy roots to total DES rose from 39 to 46 percent in the 1990s. Cassava is the most important root crop, contributing just over 60 percent of the DES supplied by starchy roots - 24 percent of total DES in 1998-2000. It is the major source of carbohydrates and is an inexpensive source of food energy for the majority of Ghanaians - cassava generally has the highest calorie to price ratio in Ghana (followed by plantains). It is eaten by all social classes, mainly as gari (boiled) and fufu (pounded). About 57 percent of cassava production originates in the Eastern, Ashanti and Brong-Ahafo regions while 75 percent of yam production is located in the Eastern, Brong-Ahafo and Northern regions (FAO, 2002). Specifically, the cassava and yam producing areas are:

- Cassava: Western, Central, Eastern, Volta, Ashanti, Brong-Ahafo, Northern regions.
- Yam: Western, Eastern, Volta, Ashanti, Brong-Ahafo, Northern and Upper West regions.

### **Cassava**

The analysis of cassava production is complicated by a break in the data series in 1991. Due to a revision of the data, production, yields and area harvested saw very

<sup>13</sup> We used the average yield figure of 0.98 for 1981-85

<sup>14</sup> Tripp and Marfo (1997) cite survey evidence indicating that almost one in four maize farmers had experienced some contact with SG 2000.

large increases between 1990-1991. Our discussion will focus on the pre-1991 and post-1991 series.

Cassava production growth accelerated after 1983 and, following the jump from 2.7 to 5.7 million tonnes in 1990-1991, growth continued at a relatively high rate (compared to 1961-1983). After stagnating at around 8 tons per hectare between 1966-1990 yields rose significantly after 1991 reaching 11.4 tons/hectare in 1998 and 12.4 tons/hectare by 2004. However, acreage increases account for over 70 percent of the production increases between 1981-85 and 1996-2000. Today cassava is the largest agricultural commodity produced in Ghana representing about 22 percent of agricultural GDP.

	<b>Production: Million Tons</b>	<b>Area Harvested: '000 Hectare</b>	<b>Yield: Tons/Hectare</b>
1966 - 1970	1.52	190	8.05
1971 - 1975	1.66	233	7.16
1976 - 1980	1.83	233	7.85
1981 - 1985	2.06	238	8.69
1986 - 1990	2.99	398	7.54
1991 - 1995	5.99	538	11.14
1996 - 2000	7.45	622	11.97
2001 - 2004	9.67	778	12.43

Source: FAOSTAT

Initially concentrated in the southern regions cassava is today grown extensively in 4 of the 5 agro-ecological zones. Adoption was aided by widespread crop failure following a major drought in 1982/83 which led many farmers to turn to cassava because it tolerates drought and grows in relatively poor soils. Because it can be harvested anytime from 8 to 24 months after planting it provides a safeguard against unexpected food shortages. Farmers initially introduced cassava as a food security crop in places where it had not previously been grown, especially in dry areas and marginal lands. However, with the growing acceptance of cassava as a staple food for urban dwellers, more farmers also began to grow it as a commercial crop.

New cassava varieties have been credited with making an important contribution to the boom in cassava production in the 1990s (FAO, 2000) and we turn, briefly, to this issue. Following the 1982/83 drought the government of Ghana requested assistance from FAO which came in the form of a consultancy - on biological control of cassava pests and the introduction of improved cassava varieties - provided by the International Institute of Tropical Agriculture (IITA) at Ibadan, Nigeria. While biological controls of cassava pests were introduced fairly quickly the adaptation of new varieties (released by IITA in 1984) to local climatic and soil conditions took more time. In 1988 the government sought financial assistance from IFAD to support root and tubers crop research as part of the Ministry of Food and Agriculture's Smallholder Rehabilitation and Development Programme (SRDP). This led to the National Root and Tuber Crops Improvement project (NRTCIP), a component of the SRDP executed by the Crops Research Institute (CRI) from 1988 to 1996. Three high yielding, pest and disease resistant varieties have been released by NRTCIP in 1993 (MOFA, 1997).

As already noted, the large jump in yields in 1991 was a result of a revision of the data and did not represent real yield increases in that year. Assuming that the

new varieties had immediate and widespread impact in 1993 it follows that they helped raise yields from 11.2 in 1993 to 12.3 in 2001. The growth in yields would account for about 30 percent of the overall production growth in this scenario. If, as seems more realistic, new varieties would take some time to diffuse in the country and the starting point for higher yield levels is taken as 1995 then the yield increases would account for 12 percent of the production increase between 1995 and 2000. Yield increases were clearly significant, but much less so than acreage increases. The importance of the new improved varieties is not immediately obvious from the available data.

## Yams

Yam production followed a roughly similar trend to that of cassava – with yam statistics also having been revised in 1991. A steep drop in 1993 was followed by steady, and by historical standards high, growth from 1994 to 2000. Production gains in the 1980s were due to acreage expansion while post 1990 increases were significantly aided by the gradual rise in yields in the 1990s.

	<b>Production: Million Tons</b>	<b>Area Harvested: '000 Hectares</b>	<b>Yield: Tons/Hectare</b>
1966 - 1970	1.10	119	9.70
1971 - 1975	0.77	137	5.62
1976 - 1980	0.58	100	5.79
1981 - 1985	0.84	154	5.46
1986 - 1990	1.05	178	6.03
1991 - 1995	2.30	198	11.65
1996 - 2000	2.80	216	12.94
2001 - 2004	3.79	305	12.43

Source: FAOSTAT

The expansion of cassava and yam<sup>15</sup> production is particularly significant as consumption of these foods reaches a peak during the “hunger season” just before the harvest, when crops such as maize are in short supply or too expensive to purchase. The seasonal availability of food impacts on the nutritional status of individuals. A study using Ghana Living Standards Survey (GLSS) data for 1987 and 1989 by Nubé, van den Boom and Asenso-Okyere (1990) shows that the average BMI for adults in households which also farm root crops<sup>16</sup> fluctuated around a mean value of 20.5 with no clear seasonal pattern. On the other hand, the average BMI for adults in ‘cereals only’ households was 19.7 with a distinct seasonal pattern. In this latter group the average BMIs fluctuate by about 1.5-2 units (about 4-5 kilogram on average) and reach their lowest level towards the middle of the year, just before harvesting of the main calorie providing crops. Moreover, in the ‘cereals only’ sample

<sup>15</sup> Yams and cassava are both crops with important food-security attributes. Growing time for cassava and yam is about 8-24 and 8-11 months respectively, with both having a long in-ground storage time. In comparison to cassava yams store well after harvest (4-6 months). A constraint on yam production is the limited availability and high cost of planting material as well as the high labour input (about 40 percent of production costs) required. Cassava, on the other hand, benefits from low labour input requirements. In Ghana’s case, cassava is obviously of much greater significance as it is grown by many more households.

<sup>16</sup> Cereal only producing households being those which devoted less than 5 percent of the cultivated area devoted to food production.

the percentage of adults with a BMI under 18.5 (below which individuals are classified as chronically energy deficient) ranges from 38.0 to 19.4 while in the 'cereals + roots' sample the range is 23.0 to 16.6.<sup>17</sup> Interestingly, cereal stocks follow a distinctly seasonal pattern in both samples while the root crop stocks of the 'cereals + roots' sample shows no clear seasonal pattern.

## Plantain

Plantains account for about 9 percent of DES and play an important role in the Western, Eastern, Ashanti and Brong-Ahafo regions.

	<b>Production: Million Tons</b>	<b>Area Harvested: '000 Hectare</b>	<b>Yield: Tons/Hectare</b>
1966 - 1970	0.76	139	5.48
1971 - 1975	0.97	177	5.46
1976 - 1980	0.92	160	5.74
1981 - 1985	0.99	183	5.50
1986 - 1990	1.04	180	5.80
1991 - 1995	1.34	178	7.49
1996 - 2000	1.91	239	7.97
2001 - 2005	2.29	278	8.22

Source: FAOSTAT

Production rose strongly in the early 1980s and again in the early 1990s due mostly to an increase in area cultivated. Area harvested rose quite steeply in the early 1980s, to reach 266 thousand hectares, but then fluctuated and fell back to about 130 thousand hectares. The 1990s have seen a steady growth in acreage reaching 213 thousand in 1995 and 246 thousand hectares in 1998. Production followed this pattern, rising from 0.76 million MT in 1983 to exceed 1.2 million MT in 1984. Thereafter production stagnated at this higher level (except for 1990 when output fell back to 0.8 million mt) after which production rose steadily (with acreage) to reach 2.4 million mt in 2004.

## Reliability of the Data

Using GLSS data Alderman and Higgins (1992) find a relatively high average calorie availability at the national level but also that the distribution is skewed towards the highest income groups. They find that the large discrepancy between the GLSS and FAO estimates of calorie availability are in large part due to a different assessment in post-harvest crop losses. Their results, if correct, would reinforce our conclusion that the key factor of under-nourishment is access, rather than supply.

As noted before, cassava statistics were revised in 1991. This has led to a change in FAO's estimates of cassava utilization (on the basis of the Food Balance Sheets). Specifically, while food constituted about 72 percent of production in 1989 and before, this fell to 53 percent in 1991 and stood at 45 percent in 2002. While

<sup>17</sup> Nubé, van den Boom and Asenso-Okyere (1990) point out that other factors, such as off-farm employment opportunities, also play a role. However, the statistically significant impact of the cropping pattern on adult BMI remains when off-farm income and per-capita expenditure are included – albeit being treated as exogenous.

cassava production and cassava utilized as food grew at nearly identical rates prior to 1991 this changed thereafter. According to the FAO 'Food Balance Sheet' much of the increased production went to feed, waste and other uses. In 1990 feed, waste and other uses accounted for 0, 760,000 and 8,000 tons. In 1991 these figures were 802,000, 1,711,000 and 160,000 tons respectively. That means that of the one-time increase in production experienced in 1991 only 36 percent translated into food production (in the Food Balance Sheets). Indeed, if cassava utilized had been calculated on the same basis as pre-1991 then per-capita supply would have stood at 336 kg per year in 2002, as opposed to 213 implying that calories per-capita per-day would have been higher by 367 kcal/capita/day. The fact that we have two separate series casts doubt on the usefulness of using the data to draw comparisons between 1979-81 and 1998-2000.

## **Access to Food**

### **Food Prices and Wages**

In the above section we explained which crops were key to increasing food availability in Ghana over the 1980-98 period. This increase was due in part to an increase in acreage and in part to increased yield, depending on the crop and the year(s). Acreage expansions are linked to improved terms of trade and/or better market access for farm products while yield increases are due to the introduction of improved varieties and farm practices. The resulting increase in output has dampened price increases. Food prices are seen as important determinants of nutritional outcomes (United Nations, 1989). Grains, cereals, roots and tubers account for about 41 percent of the total budget of Ghanaian households according to GLSS data (Maxwell, et al (2000)) and consequently affordable staple foods are very significant in terms of reducing poverty and under-nourishment.

Historically, government interventions helped depress maize prices in Ghana. However, following the elimination of many of the interventions, and despite a rapid increase in fuel prices, real maize prices declined (Badiane and Shively, 1998). Indeed, Alderman and Shively (1996) report generally falling real wholesale prices of food in Ghana in the 1970s and 1980s. During the 1980s this was probably due to reduced transportation costs due to road improvements and availability of spare parts.<sup>18</sup> Estimates of how much transportation costs contribute to the market price of food crops vary. Data produced in FAO (1996) indicates transportation costs accounting for about 11 and 6 percent (of the retail price) for cassava and maize respectively. Other sources suggest transportation costs account for about 50 percent of the market price of food crops (Puplampu, 1999). According to Jebuni and Seini (1992) farmers paid 70 percent less for ploughing and 30 percent less for carting, in real terms, in 1990 than they did in 1980.

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<sup>18</sup> In 1983 only 15 percent of the trunk road system was in good condition, 40 percent fair and 45 percent poor. By 1999 42 percent was categorized as good, 26 percent as fair and 32 percent as poor. Information from the Ghana Highway Authority at <http://www.winne.com/ghana/cr05.html>.

<b>Year</b>	<b>Maize</b>	<b>Cassava</b>	<b>Plantain</b>	<b>Yam</b>	<b>Sorghum</b>	<b>Millet</b>	<b>Local Rice</b>	<b>Cocoyam</b>
1970	161	140	46	144	182	180	154	81
1971	150	160	65	146	175	178	145	96
1972	191	173	50	152	182	183	177	97
1973	179	153	62	159	217	200	182	111
1974	169	154	57	172	195	196	169	107
1975	158	182	55	181	153	147	178	100
1976	231	241	73	168	247	237	232	122
1977	223	288	99	164	255	242	153	147
1978	145	155	85	154	161	163	123	102
1979	117	119	60	123	128	127	89	82
1980	193	167	60	135	221	188	122	84
1981	167	190	42	100	159	154	111	81
1982	141	175	47	114	178	179	149	92
1983	306	307	90	167	380	291	216	206
1984	133	124	70	119	207	204	175	107
1985	105	106	66	105	115	136	122	50
1986	137	151	59	112	134	134	114	80
1987	159	243	79	96	144	128	141	120
1988	154	93	69	131	155	159	196	97
1989	97	115	74	127	142	156	252	89
1990	113	150	89	118	115	116	111	97
1991	105	115	58	98	123	129	96	79
1992	101	105	64	88	122	119	96	85
1993	89	113	77	97	122	112	99	90
1994	89	96	74	103	96	96	101	96
1995	100	100	100	100	100	100	100	100
1996	91	74	61	81	100	96	99	65
1997	139	89	84	92	120	122	102	85
1998	112	137	92	136	126	133	93	106
1999	76	83	61	84	93	98	87	86
2000	125	117	111	87	101	113	101	87
2001	151	211	135	108	159	174	116	92
2002	118	147	89	111	153	149	110	105

Source: Ministry of Food and Agriculture.

With regard to wages we focus on the legal minimum wage which may be a reasonable indicator of the wages for unskilled workers (Alderman and Shively, 1996).<sup>19</sup> Throughout the 1980s the situation was very difficult as the minimum wage rate was insufficient for an individual to support dependents.<sup>20</sup> The 1990s saw an improvement due to both increases in the official minimum wage as well as relatively weak food prices (table 9). As a result the ratio of the minimum wage to the price of maize rose to around 4.8 between 1991-1998.

<sup>19</sup> Alderman and Shively (1996) report evidence from the GLSS 1987-99 that indicates that less than 10 percent of individuals reporting a wage earned less than the legal minimum (the rate was 15 percent of individuals receiving a wage for agricultural labor).

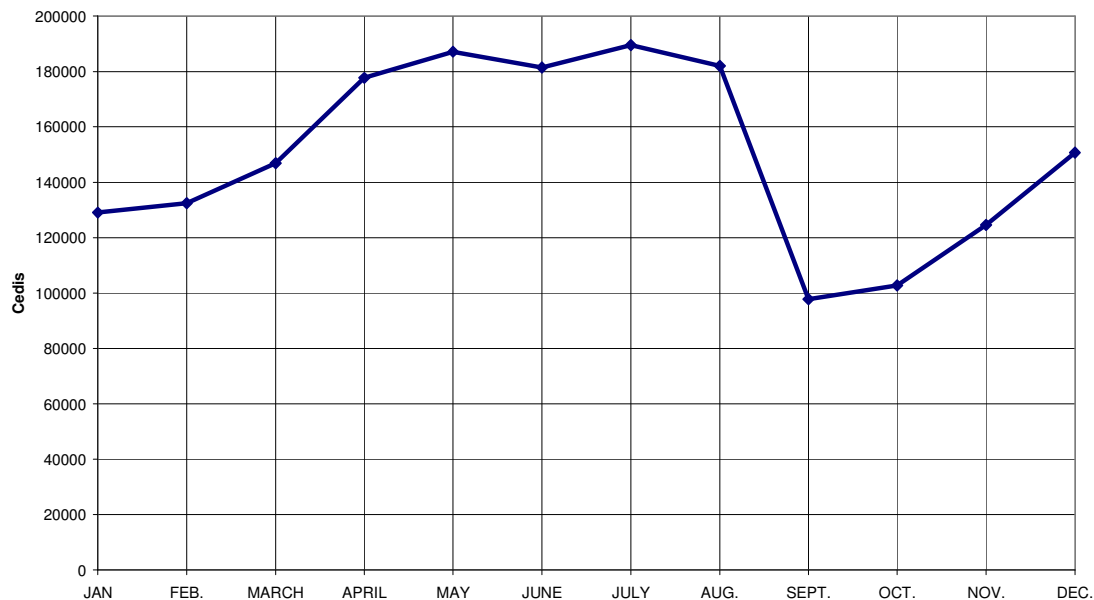
<sup>20</sup> Alderman and Shively (1996) note that a kilogram of maize provides about 1.5 times the calorie requirement.

1984	1.5
1985	3.4
1986	2.7
1987	2.1
1988	2.1
1989	3.1
1990	2.5
1991	4.9
1992	4.6
1993	5.0
1994	5.7
1995	4.9
1996	5.2
1997	3.1
1998	4.9

Source: Ministry of Food and Agriculture (2001).

It is important to keep in mind that seasonal price fluctuations are large. Alderman and Shively (1996) report a 50 percent difference in real price of maize in urban markets between pre-harvest (June) and post-harvest (September) using data for the 1980s. Figure 4, using nominal wholesale prices for 2001 shows a similar gap.

Figure 4: Monthly Nominal Wholesale Price of Maize (2001)



Source: Ministry of Food and Agriculture

Grain prices continue to be subject to very strong seasonal fluctuations, particularly in the three northern regions (FAO, 2002). This has significant negative repercussions for food insecure households. In this regard we again note the increased significance of availability of cassava in the "hungry season."

## Economic Performance Pre-1983<sup>21</sup>

At independence in 1957 Ghana had one of the highest per-capita incomes in Africa placing it among middle-income countries by today's standards. The country was the world's largest producer of cocoa and had external reserves that were equal to three years of imports.

Economic Indicator	1971	1976	1981	1986	1991	1996	2001
	- 1975	- 1980	- 1985	- 1990	- 1995	- 2000	- 2004
GDP growth (annual %)	0.0	1.0	-0.3	4.8	4.3	4.3	4.8
Inflation, consumer prices (annual %)	17.1	70.0	62.3	31.6	27.5	25.3	21.8
GDP per capita (constant 2000 US\$)	284.9	70.0	199.6	206.5	225.4	243.8	272.0
GDP per capita growth (annual %)	-2.8	-1.1	-3.8	1.8	1.5	2.0	2.9

Source: World Development Indicators 2004.

By 1966 when the Nkrumah government fell, GDP-per-capita was no greater than in 1951 and per-capita income continued to decline steadily until 1983. At the root of Ghana's economic decline lay unsustainable levels of government expenditure, an increasingly overvalued exchange rate, import licensing, inflation and price controls and heavy state involvement in the running of the economy.<sup>22</sup> The result was a steadily deteriorating economic situation and widespread rent-seeking which increasingly undermined Ghanaian institutions and society.

By the early 1980s Ghana had been surpassed by at least half of sub-Saharan countries in terms of per-capita GDP. Government revenues fell from 15% of GDP in the early 1970s to 6% in 1982. Public sector wages fell by an average of 10 % in real terms per year between 1975-1983. Export earnings fell to a low of 7 percent of GDP and external financing dried up. Moreover, price controls led to much of the economic activity taking place in parallel markets and to a shortage of goods and services.

## Political Will to Introduce Change

The deteriorating economic and political situation eventually led to a coup by junior members of the armed forces, led by Flight-Lieutenant Jerry J. Rawlings. A brief return to civilian rule, marked by ineffectiveness and allegations of corruption, was ended by Rawling's second coup and the establishment of the Provisional National Defence Council in 1981. After a short and turbulent start the country gradually moved towards political stability and after elections in 1992, 1996 and 2000 the country is today considered an example of a working democracy.<sup>23</sup>

<sup>21</sup> See Leith and Söderling (2000) for a detailed review of economic policy since independence. Tsikata (1999) gives a succinct overview of economic policies from independence.

<sup>22</sup> In 1984 2.5 percent of the entire population of Ghana was employed in the Civil Service – one of the highest ratios in Africa. Public enterprises and boards employed another 2 percent. Preliminary audits conducted in 1986 indicated that there were tens of thousands of 'ghost workers' on the public sector pay-roll (Alderman, Canagarajah and Younger, 1993).

<sup>23</sup> Despite periods of political instability Ghana is, by-and-large, a peaceful country. Over the 1979-98 period there have been only three main trouble spots with local significance for food security. All are located in the Northern part of the country: the Kokomba/Nanumba conflict, the Bawku chieftaincy dispute and the Dagbon chieftaincy dispute. Although the impact of these conflicts on local communities has been devastating the wider impact on food security has been marginal.



The roots of the successful transition lay in the government's determination to create a system of government based on genuine participatory decision making. In 1982 the National Commission for Democracy (NCD) was established to engage in political education, advising the government in developing participatory democracy and to monitor the government's performance in fostering a democratic environment. Although slow, the process led to a new system of elected government at the district level - in place by early 1989. Following this the NCD started work on developing a democratic structure at the national level, leading to a report in 1991 recommending multi-party democracy.

1992 saw the adoption of a new constitution and multi-party elections. Another round of elections were held in 1996 and again in 2000. In the last elections the government changed hands with the former opposition now holding the reigns of power.

### **Economic policy and performance post 1983**

The new government had initially embarked on a course of populist policies but after two years it became apparent that the economic decline continued. In addition to the already serious economic and political situation Ghana faced drought and bushfires in 1983 as well as the forced return of over 1 million Ghanaians from Nigeria.

The government responded by introducing a number of ad hoc programmes to deal with the emergencies and in April 1983 initiated a program of economic stabilization and market reform, known as the Economic Recovery Program (ERP).<sup>24</sup> The reform strategy included: a realignment of relative prices; removing direct controls and interventions; restoring fiscal discipline; rehabilitating economic and social infrastructure, and; implementing structural and institutional reforms.

Of central importance to the ERP was exchange rate policy (table 11). By 1982 the Cedi was estimated to have been overvalued by 1000 percent (Leechor, 1994) with the official rate of exchange being 2.75 Cedis/US\$ while a US dollar would buy 60 Cedis on the parallel market. Devaluation rapidly lowered the premium and eliminated it by the early 1990s.<sup>25</sup> The real effective exchange rate has dropped from 1222 to 81 between 1983 and 2000.<sup>26</sup>

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<sup>24</sup> See Tsikata (1999) for a discussion of the political circumstances leading up to the implementation of the ERP.

<sup>25</sup> Devaluation does not appear to have been inflationary. Younger (1992) finds that a 100 percent devaluation raised prices by between 5 to 10 percent and food prices by about 8%, all within the first two months of the exchange rate shock.

<sup>26</sup> The real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.

<b>Trade Indicators</b>	<b>1971-1975</b>	<b>1976-1980</b>	<b>1981-1985</b>	<b>1986-1990</b>	<b>1991-1995</b>	<b>1996-2000</b>
Exports of goods and services (% of GDP)	19.1	10.9	6.5	17.6	20.8	35.9
Exports of goods and services (annual % growth)	-2.8	-7.9	-1.6	9.2	7.1	13.4
Official exchange rate (Cedis/US\$)	1.2	1.9	20.9	208.3	722.2	2825.2
Real effective exchange rate index (1995 = 100)	..	651.3	1060.9	153.4	111.4	111.3
Trade (% of GDP)	37.5	22.4	14.2	41.7	52.9	87.6
Parallel market premium (%; 0 means zero)	35	367	1289	47	3	0.8 (1996-99)

Source: World Development Indicators, 2002; \* Levine and Renelt; World's Currency Yearbook (for 1985, 1990-93); Adrian Wood, Global trends in real exchange rates: 1960-84, WB Discussion paper no. 35. 1988 (filling in missing observations); Global Development Finance & World Development Indicators (for 1996-1997, calculated as  $(\text{parallel Xrate}/\text{official Xrate}-1)*100$ ); values for industrial countries are added as 0)

The ERP, aided by increased inflows of external financing (table 12)<sup>27</sup> led to a reversal of the economic decline with GDP rising by about 5 percent per year between 1983-92.<sup>28</sup> Inflation fell from 123 percent in 1983 to 10 percent in 1992. In response to lower taxation and fewer controls exports grew by an average of 10 percent in real terms over the 1984-94 period. Imports grew at a similar pace. At the same time government revenues significantly increased. The strongest performing sectors were mining, utilities, construction and most of the services, in particular transport and the wholesale/retail sector. Manufacturing grew rapidly in the 1984-86 period but growth has since fallen below overall economic growth rates. Non-traditional exports (mainly processed and semi-processed goods) have grown strongly over the 1986-1998 period from 23.8 million US\$ to 401.7 million US \$ (from 5 to about 20 percent of total exports). Between 1986 and 1998 the number of non-traditional items (agricultural and non-agricultural) rose from 100 to 250 (IMF, 2000).

<b>Aid Indicators</b>	<b>1971-1975</b>	<b>1976-1980</b>	<b>1981-1985</b>	<b>1986-1990</b>	<b>1991-1995</b>	<b>1996-2000</b>	<b>2001-2002</b>
Aid (% of central government expenditures)	10.3	7.7	13.6	71.9	66.3	---	---
Aid (% of GNI)	2.5	3.4	3.8	10.0	10.9	9.4	11.7
Aid per capita (current US\$)	6.7	11.8	13.0	36.0	40.4	32.5	32.5
ODA and official aid (current US\$)	63.8	125.9	161.0	525.8	663.9	611.4	652.8
ODA (% of GDP)	2.5	3.4	3.8	9.8	10.7	9.1	

Source: World Development Indicators 2004.

Progress has not been steady. In the 1990s Ghana experienced slower growth of around 4 percent per year (still above pre-ERP levels) due to the 'boom and bust' style of economic management.<sup>29</sup> Investment growth was not realized<sup>30</sup> and fiscal stabilisation was not maintained around election years. Indeed fiscal profligacy led to marked increases in inflation in election years (47 percent in 1996

<sup>27</sup> Total aid flows jumped very significantly between 1989 and 1992 as donors aimed to support institution-building activities in the run-up to the multi-party elections set for 1992 (Tsikata (1999)).

<sup>28</sup> Real annual growth of 5 percent would imply a time-frame of about 30-40 years to eradicate poverty (Hadjimichael, 1996).

<sup>29</sup> See Tsikata (1999) for more details.

<sup>30</sup> In part because of the mixed signals (through, for example, the slow progress of the privatisation program) that government sent to private investors.

and 35 percent in 2000) and increased domestic and foreign debt burdens.<sup>31</sup> This macroeconomic instability has slowed the decline in poverty (Leite et al, 2000).

### **Agriculture after 1983**

As was the case for economic policy, 1983 saw a completely new approach to agricultural sector policies.<sup>32</sup> Broadly speaking the government privatised state farms, removed price controls<sup>33</sup> and gradually reduced subsidies on inputs such as fertilizer (subsidies were phased out by the latter part of 1990). Specifically the government drafted a new agricultural policy: The 'Ghana Agricultural Policy: Action Plan and Strategies 1986-88.' Key objectives outlined in this initiative were:

- Self-sufficiency in cereals, starchy staples and animal protein food with priority for maize, rice and cassava in the short term.
- Maintenance of adequate buffer stocks for price stabilization and food security during shortfalls.
- Improving institutional facilities such as research, credit and marketing.

The 'Action Plan and Strategies' lacked effectiveness in part due to the weak institutional capacity of the country. The GOG, in collaboration with the World Bank, consequently embarked on the 'Agricultural Services Rehabilitation Project (ASRP)' over the 1987-1990 period. The main objectives of the project were to:

- Strengthen the institutional framework for formulating and implementing agricultural policies and programmes.
- To improve the delivery of public sector services.
- To improve the procurement and distribution of agricultural inputs by way of privatisation.

The ASRP project did achieve a strengthening of the capacity of agricultural research, extension, irrigation and policy planning institutions. To build on the short-term improvements the government, with support from the World Bank, decided on the implementation of a higher resourced medium-term program focussing on the key areas of agricultural research, extension, livestock, fisheries development and export promotion. The 'Medium Term Agricultural Development Program (MTADP)' covered the 1991-2000 period and was broadly aimed at increasing productivity and competitiveness in the agricultural sector. A number of stand-alone projects were launched under MTADP such as the 'National Agricultural Research Program' (NARP), the 'National Agricultural Extension Program' (NAEP), and the 'Fisheries Capacity Building Project' (FSCBP).

The changed macroeconomic environment after 1983 profoundly affected the cocoa sector which was and remains of significant importance to the Ghanaian economy. The pre-1983 price distortions led to cocoa producers (along with other agricultural producers) facing an increasingly skewed incentive structure as the

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<sup>31</sup> The increased government spending was also due to pressure from groups such as doctors, the Cocoa Board members, railway employees and civil servants.

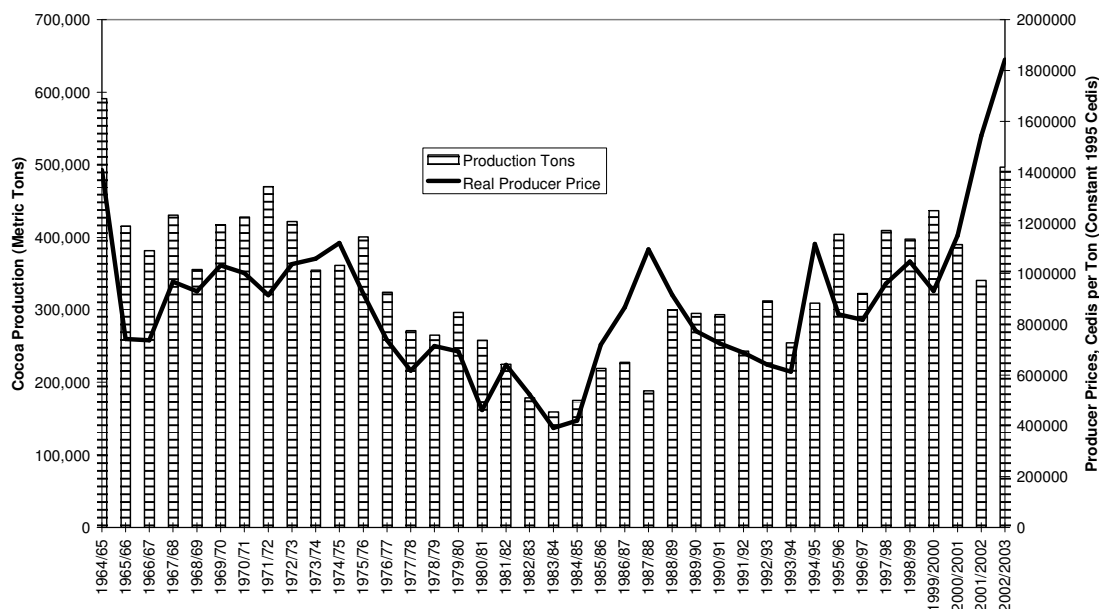
<sup>32</sup> There are about 2.37 million farms operated in Ghana with small and medium sized farms up to 10 hectares making up 95 percent of all cultivated land (mean farm size is about 1.6 hectare).

<sup>33</sup> In 1990 the government removed the guaranteed minimum price paid to farmers for selected food crops (mainly maize and rice). Procurement was facilitated through the Ghana Food Distribution Corporation (GFDC), set up in the 1960s. On average the GFDC bought less than 5 percent of the maize and rice produced in the country, i.e. had minimal impact. This was due to a lack of storage facilities and weak infrastructure in the absence of which state intervention proved ineffective (Puplampu, 1999).

sector became increasingly heavily taxed.<sup>34</sup> In 1983 cocoa farmers, for example, received only 21 percent of the producer price. Cocoa production, along with most other commodities, started falling in the seventies and continued on a downward path until the early-mid eighties by which time production had fallen to below 200 thousand tons. Despite falling production export revenues rose due to positive price trends, thereby helping successive governments to avoid difficult reforms in the 1970s.

To revert the negative trend in production the government followed a policy of increasing the farmer's share in cocoa earning to around 40 percent by 1994/95 and 50 percent by 2000/01 (ADB, 2002). Cocoa production has gradually increased and this, together with higher producer prices (figure 5) has significantly (we'll return to this point below) impacted on the 1.6 million smallholder farmers in the growing cocoa on plots of typically less than 3 hectares.<sup>35</sup> The export friendly policies have also led to an expansion in non-traditional agricultural exports from 17.8 to 77.8 million US\$ over the 1986-1998 period (Leite et al, 2000).

Figure 5: Ghana Cocoa Production and Producer Prices: 1964/65 - 2003/2003



Source: Ghana Cocoa Board ([www.cocobod.gh](http://www.cocobod.gh))

Despite the increased attention given to agriculture, growth in the sector remained relatively sluggish throughout the 1980s and also in the first half of the 1990s. The much improved performance of the agriculture sector in the second half of the 1990s is very promising and a result of the improved macroeconomic environment and the governments agricultural policies. Structural weaknesses –

<sup>34</sup> Heavy taxation of agriculture has been one of the factors contributing to poor economic performance. See Schiff and Valdes (1995) for evidence on the inverse relationship between taxation of agriculture and agricultural growth (and overall economic growth).

<sup>35</sup> Cocoa farming is located mainly in the Ashanti, Brong-Ahafo, Eastern and Western regions, with smaller volumes coming from the Central and Volta regions.

inadequate roads, poor access to markets, inappropriate agricultural practices, low technology, etc. – were and, though to a lesser extent, remain key constraints which retard growth. Slower growth in this sector has had important consequences for poverty reduction among food crop farmers. We return to this issue below.

<b>Years</b>	<b>Agriculture - value added</b>	<b>GDP growth</b>
1981 - 1985	-0.9	-0.3
1986 - 1990	1.8	4.8
1991 - 1995	2.5	4.3
1996 - 2000	4.2	4.3
2001 - 2004	4.3	4.8

Source: World Development Indicators, 2004.

### **Agricultural Research<sup>36</sup>**

At the time of independence the agricultural research system, in contrast to many other parts of Africa, had been relatively well developed. Between the mid-1960s and the end of the 1970s the number of researchers rose from 90 to 200 with 60 percent of the public research expenditure being allocated to cocoa. Declining revenues and inflation saw government cut costs leading to the abandonment of remote field stations and a near halt to capital development projects. With public sector salaries hardly sufficient to meet subsistence needs many scientists and senior administrators left Ghana.

By the late 1980s robust economic growth had rekindled demand for improved agricultural technologies. While government support to agricultural research after 1984 remained flat, donor support increased. Incentives for scientists have improved but attracting and retaining scientists apparently remains a problem (Ghanaian Chronicle, 2003). The impact of agricultural research on increased food production is difficult to assess, but improved research capacity does appear to have, in the 1990s, helped improve yields for key staple crops in the country.

### **Social Safety Nets**

Most of the safety nets developed in post independence Ghana succumbed to the economic crisis of the late 1970s and by 1983 what remained of them was scrapped. However, the ERP caused serious hardship amongst large sections of the population. The removal of subsidies, the introduction of user fees for education and health services, and the retrenchment of many public service workers imposed high social costs.

In order to address these costs the government (with help from UNICEF and the World Bank) introduced the 'Programme of Action to Mitigate the Social Costs of Adjustment (PAMSCAD) in 1988. US\$ 83 million were to be spent over two years on 23 projects in five main areas: community initiatives, employment generation, actions to help retrenched workers, basic needs of vulnerable groups, and education.

<sup>36</sup> This section is based on Tabor, Papafio and Haizel (1993).

The PAMSCAD program evaluation report indicates that close to 840 thousand jobs were created in the field of construction (roads or buildings) and credit was given to about 24 thousand small-scale entrepreneurs including 881 redeployed staff and 3800 women. Also provided were 800 wells and 480 latrines (to 40 and 8 percent respectively of expected target beneficiaries). Further, supplementary food and advice on the proper mode of preparing food was given to beneficiaries in 90 communities.

On the other hand the program started off slowly with only US\$ 15 million having been disbursed by mid-1990. A number of factors, such as late disbursement of funds, the temporary nature of the jobs created, and non-repayment of loans, weakened the impact of many of the projects. An evaluation report suggested that only eight of the 23 projects had made good progress. Inadequate recurrent funding, political interference and too much bureaucracy weakened its impact. The program suffered from too wide a spectrum of program activities and from time consuming and multiple reporting requirements which slowed implementation. PAMSCAD strained the implementation capacity of the government and under 20 percent of support actually pledged by donors were actually disbursed on projects.

PAMSCAD was envisaged as a short term, 'rapid' response programme and was replaced by a more decentralized system. In 1992 the constitution introduced the District Assemblies Common Fund which provide support to development projects in the districts. Financing is provided by the central government (and donors) with the requirement that at least 5 percent of funding comes from local tax revenue.

The National Poverty Reduction Program is funded by the government and the UNDP. It is aimed at reducing poverty and aims in particular at building management capacity (of the district assemblies, community organizations, etc), empowering women and promoting female education and to implement the Social Investment Fund (SIF). The latter is a community-based, demand-driven rapid disbursement fund established with support from the UNDP and the AfDB. Its main goals are to facilitate access of the poor to basic social and economic infrastructure and services, to provide credit to micro enterprises, and to strengthen the delivery of poverty reduction programs.

Although social safety nets were inadequate they did provide some temporary relief for quite a number of people affected by the economic reforms. They could not, however, be credited with playing a significant role in reducing under-nourishment over the long-term. A 1996 study of poverty in Accra found few formal programs aimed at poverty alleviation or reduction (Maxwell et al, 2000). The authors noted the following survival strategies: In the rural north out-migration to seek employment (mainly young men); sending children to stay with kin in times of stress, and; gathering 'famine' foods. In the rural south: reducing expenditures (taking children out of school); urban south: reducing expenditures (switching to street foods for example; withdrawing children from school; seeking other income sources).

## Related indicators

### Poverty<sup>37</sup>

On the basis of the Ghana Living Standards Survey (GLSS) data and a 700,000 Cedi food-poverty line<sup>38</sup> the poverty incidence in Ghana has fallen from 36.5 percent in 1991/92 to 26.8 percent in 1998/99 (table 14). Given the rise in the population numbers this means a drop from 5.76 to 5.01 million people faced with food-poverty.<sup>39</sup>

There are large rural and regional differences in poverty and changes in poverty. Poverty has fallen steeply in the Greater Accra and other regions but has increased in the Central, Northern and Upper East regions. At the national level the reduction in poverty was almost entirely due to economic growth. The overall redistribution effect was negligible although it played an important role in the Accra region where reduced inequality significantly helped reduce poverty. Worsening inequality in other parts, especially the urban coastal region offset this positive development.

	Poverty Index	% Contribution to National Poverty	Poverty Index	% Contribution to National Poverty
	1991/92		1998/99	
<b>Location</b>				
Urban	15.1	13.7	11.6	14.4
Rural	47.2	86.3	34.4	85.6
<b>Region</b>				
Western	42	11.7	13.6	5.9
Central	24.1	6.8	31.5	10.5
Greater Accra	13.4	4.3	2.4	1.1
Eastern	34.8	12.3	30.4	13.2
Volta	42.1	10.4	20.4	9.5
Ashanti	25.5	11.1	16.4	10.3
Brong Ahafo	45.9	14.9	18.8	6.1
Northern	54.1	14	57.4	21.9
Upper West	74.3	6.4	68.3	8.2
Upper East	53.5	8.2	79.6	13.4
<b>National</b>	<b>36.5</b>	<b>100</b>	<b>26.8</b>	<b>100</b>

Source: Ghana Statistical Service (2000): Computations based on the Ghana Living Standards Survey, 1991/92 and 1998/99.

<sup>37</sup> The main Government of Ghana instruments for monitoring poverty and social conditions are the Ghana Living Standards Survey (GLSS), the Ghana Demographic and Health Survey (GDHS) and the Core Welfare Indicators Questionnaire (CWIQ) (see Republic of Ghana, 2000). The GLSS is a multi-topic household survey undertaken by the Ghana Statistical Service in 1987/88, 1988/89, 1991/92 and 1998/99. In 1996 the Ghana Statistical Service adopted the Core Welfare Indicators Questionnaire (CWIQ) as the instrument to monitor living standards in a timely manner. The CWIQ uses a set of readily observable indicators to construct poverty quintiles which are closely correlated to the GLSS expenditure quintiles but are easier and less costly to collect. The Ghana Demographic and Health Survey (conducted in 1988, 1993, and 1998) is the third instrument used to measure and monitor poverty.

<sup>38</sup> The estimated annual expenditure per person required to meet their minimum nutritional requirements.

<sup>39</sup> Christiaensen, Demery and Paternostro (2002) report consumption poverty indices for 1992 and 1998 of 51 and 39 percent respectively. These are based on the food intake required to meet a minimum caloric intake with adjustments for essential non-food consumption. Most of the change is due to changes in mean expenditure.

The ERP and the resulting economic growth led to significant improvements in welfare for individuals from households engaged in export farming as well as public sector and private formal sector employment (table 15). Households in the food crop farming sector continued to perform worst with the incidence of food poverty having fallen from about 52 to 45 percent for this group over the 1991/92 to 1998/99 period. By 1998/99 households in the food crop farming sector contributed 65 percent to national poverty, up from 62 percent in 1991/92. These developments reflect the fact that the ERP had a more immediate impact on export oriented farmers. Outside of the export sector the agricultural sector grew sluggishly and this, through weaker income growth and fewer non-farm income earning opportunities, negatively impacted on the welfare of food crop farmers

Table 15: Food Poverty Incidence by Employment Category for 1991/92 and 1998/99				
	Poverty Index	% Contribution to National Poverty	Poverty Index	% Contribution to National Poverty
Economic Activity	1991/92		1998/99	
Public sector	21.2	7.9	9.5	3.8
Private formal sector	15.1	1.6	4.5	0.8
Private informal sector	22.5	1.9	16.1	1.7
Export farmers	49.6	8.5	19.4	5.1
Food crop farmers	51.8	61.7	45	64.6
Non-farm self employment	23.3	17.7	18.1	22.8
Non-working	13	0.7	15.1	1.2

Source: Ghana Statistical Service (2000): Computations based on the Ghana Living Standards Survey, 1991/92 and 1998/99.

The data on poverty show that food-poverty has indeed fallen significantly, although the picture is not nearly as positive as that indicated by the FAO measure. Wide ranging differences in regional and sectoral poverty emerge when considering a disaggregated poverty profile. In particular the northern parts of the country (Northern and Upper Regions) saw poverty worsening or stagnating. In these regions most farmers are dependent on food crop farming and agricultural and off-farm earnings appear to have stagnated or fallen in relative terms. We note that per-capita availability of rice, millet and sorghum, three key staple foods in the Northern and Upper regions, stagnated between 1989-1991 and 1998-2000.

### Anthropometric data

Anthropometric data from WHO for children (table 16) gives further evidence on the pattern of under-nutrition in Ghana for years covering the late 1980s and 1990s. The data for the late 1990s are roughly the same as those reported in the CWIQ survey of 1997 which found that nearly 30 percent of children under 5 were stunted, 26 percent were underweight, and 6.5 percent were wasted.<sup>40</sup> The 2003 entry shows improvement with regard to wasting and underweight. The figures for stunting remain as high as at the end of the 1980s.

<sup>40</sup> In 1997 nearly 40 percent of children under 5 attended nutrition programmes and 84 percent attended growth monitoring sessions, i.e. weightings (GSS, 1998).



<b>Year</b>	<b>Age Group</b>	<b>Stunted Height/Age</b>	<b>Wasted Weight/Height</b>	<b>Underweight Weight/Age</b>
1987 - 88	0 - 4.99	30.5	7.3	27.1
1988	0.25 - 2.99	29.4	8	30.3
1993 - 94	0 - 2.99	25.9	11.3	27.3
1998 - 99	0 - 4.99	25.9	9.5	24.9
2003	1 - 4.99	29.9	7.2	22.1

Source: WHO Global Database on Child Growth and Malnutrition  
\*-2 Standard Deviations

The available data do not suggest an improvement in the nutritional status of children under the age of 5 in the 1990s although more recent data suggests a positive trend. This indicator may also reflect the role of mother's education, mother's nutritional status, dietary diversity and the health environment.

## Education

The education indicators (table17) show significant improvements according to World Bank data. There is, however, considerable variation in the data, depending on its source. For example, according to CWIQ data (GSS, 1998) adult literacy in Ghana stood at 48 percent in 1997, 36 percent for females and 62 percent for males. Large rural/urban and regional differences were recorded in the CWIQ survey.

<b>Education Indicator</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2002</b>
Literacy rate, adult female (% of females ages 15 and above)	30	47	63	66
Literacy rate, adult male (% of males ages 15 and above)	57	70	80	82
Literacy rate, adult total (% of people ages 15 and above)	44	58	71	74
Net primary school enrolment rates*		70(1992)	82 (1998)	

Source: World Development Indicator, 2004. \*Coulombe and Mckay (2001).

A comparison of net enrolment rates for primary school children (6-12 years), using GLSS data, shows an increase from 71.5 to 76.5 for girls and 81.9 to 84.9 for boys over the 1991/92 to 1998/99 period with the largest gains seen in the poorer quintiles (Coulombe and Mckay, 2001). Data from the 1997 CWIQ survey puts the level at 88 percent.<sup>41</sup> Data from the GLSS show that enrolment levels are much lower in rural areas and is particularly low in the Northern region with under half of the children enrolled in 1996.

By all accounts the quality of education offered in state run primary schools is very low and a serious concern (see Canajarajah and Ye, 2001). About 94 percent of the primary and pre-school recurrent budget in 1997-2000 went to salaries leading to reported shortages in books and teaching materials.

<sup>41</sup> There are substantial numbers of overage children in school and the MOE gives a figure of 72 percent for gross primary school enrolment.

## Health

According to World Bank data life expectancy has risen from 53 to 58 years between 1980 and 1999. Vaccination services have improved and there has been a significant decline in infant mortality – from 157/1000 in 1980 to 112/1000 in 2000 - despite continuing high levels of malnutrition.

<b>Health indicator</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2003</b>
Fertility rate, total (births per woman)	..	5.5	..	4.4
Immunization, DPT (% of children ages 12-23 months)	7	58	84	80
Immunization, measles (% of children ages 12-23 months)	16	61	84	80
Life expectancy at birth, total (years)	..	57	..	54
Mortality rate, infant (per 1,000 live births)	96	78	62	59
Mortality rate, under-5 (per 1,000)	157	125	100	95

Source: World Development Indicators 2004.

Government health spending, in real terms, has fallen during the 1990s and health expenditures suffer from poor targeting with only 11.2 percent of public sector health spending going to the poorest quintile while 33.6 went to the richest quintile in the early 1990s (Castro-Leal et al, 1999). The share of spending on district services has increased but the distribution of expenditure and of staff remains skewed towards urban areas and tertiary services.

The introduction of user fees, which now finance 11 percent of public sector health expenditure, has led to an increase in the number of individuals who do not consult any category of health personnel from about 43 to 47 percent in urban and 55 to 60 percent in rural areas over this period (GSS, 2000). Evidence from household surveys shows that overall utilisation rates of curative health services remain low. One study conducted in the Volta region concluded that official fee-exemptions for the poor are almost completely non-functional (Nyonator and Kutzin, 1999).

## Conclusion

The FAO-FS measure indicates that the number of Ghanaians classified as under-nourished has fallen quite dramatically - from 64 to 12 percent - between 1979-1981 and 1998-2000. These estimates are based on food availability and economic access. As the latter component was assumed to have remained unchanged over this time period the changes in the FAO-FS are due to changes in food availability. The paper shows that most of the increase in the DES was explained by an expansion in maize, cassava, yam and plantain production. Most of the output increases were due to acreage expansion which in turn is attributed to the improved economic environment and market access for farmers. Improved varieties did help raise yields for maize and cassava quite substantially and helped raise output, particularly in the 1990s. In the case of improved cassava varieties it was research at IITA and support from FAO and IFAD which made their introduction and diffusion

possible in Ghana. Much of the reduction in under-nourishment was driven by increased cassava production and we note that a break in the series in 1991 makes comparisons between 1979-1981 and 1998-2000 prone to misinterpretation.

The reduction in hunger was driven by improved economic performance which raised the earnings of many Ghanaians. In particular private and public sector and private formal sector employees and export farmers benefited most from the complete turnaround in the macroeconomic environment and performance. Fundamentally this turnaround could not have happened without the political will to implement policies that were economically painful for many Ghanaians and which met with significant political opposition.

While food supply kept up with increased demand the incidence of poverty remains particularly high for food farmers who, as a group, have seen only a marginal improvement in their economic welfare the 1990s. Agricultural sector growth remained sluggish for most of the 1980s and the first half of the 1990s. This, combined with weak food prices meant that incomes from food crop farming and non-farming activities were relatively flat. This is particularly true for the Northern and Upper regions where poverty stagnated or increased in the 1990s. The available data shows that the food-poor are increasingly concentrated in distinct groups and regions which did not benefit from economic growth. This polarization of inequality and poverty makes targeted policies and projects to raise nutritional levels and promote pro-poor growth desirable.

Other indicators of food-poverty and under-nutrition suggest that while Ghana made progress in reducing hunger the achievements have not been as spectacular as indicated by FAO's measure of under-nourishment. Or, to turn this around, the evidence would suggest that food availability is no longer the key constraint. Rather the focus must be targeted at the lack of access to food by particular occupational groups such as food farmers and in particular regions, such as the Upper East and Upper West regions. Furthermore, the anthropometric data indicate that targeted interventions at, for example, mother's education and nutritional status, are required.

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