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AGRICULTURAL MARKETING IN GHANA: STATUS AND RECOMMENDATIONS FOR IMPROVEMENT

FINAL REPORT

*Bureau for Private Enterprise
U.S. Agency for International Development*

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in collaboration with
Media Majique and Research Systems*

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FOREWORD

This Report was prepared by a team of professional marketing consultants, marketing managers and academicians, as follows:

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In accordance with its terms of reference and agreement with the USAID in Ghana, the team limited itself to agricultural product marketing, particularly of cereals, tubers, root crops, and some non-traditional export crops. The scope of its assignment did not include the marketing of inputs, meats, fishery and forestry products. The limited scope of the assignment allowed the team to systematically and more deeply analyze the structure, performance, constraints, and opportunities for improving the marketing system for the specified priority crops, despite the limited data and time available to them.

This study is part of a larger project currently being conducted by Ernst and Young for USAID/Washington D.C. and USAID/Ghana. On behalf of J.E. Austin Associates and Media Majique and Research Systems, the team acknowledges with thanks the support and confidence of those organizations.

We particularly want to mention the valuable feedbacks during our study from Messrs. Edward Birgells and Seth Vordzorgbe of USAID/Ghana.

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LIST OF ABBREVIATIONS

CIDA	CANADIAN INTERNATIONAL DEVELOPMENT AGENCY
CIMMYT	INTERNATIONAL MAIZE & WHEAT IMPROVEMENT CENTRE
COCOBOD	GHANA COCOA MARKETING BOARD
CRI	CROP RESEARCH INSTITUTE
DANIDA	DANISH INTERNATIONAL DEVELOPMENT AGENCY
DAPIIT	DEVELOPMENT AND APPLICATION OF INTERMEDIATE TECHNOLOGIES
DMECD	DEPARTMENT OF MASS EDUCATION AND COMMUNITY DEVELOPMENT
DRC	DOMESTIC RESOURCE COST
ECOWAS	ECONOMIC COMMUNITY OF WEST AFRICAN STATES
EEC	EUROPEAN ECONOMIC COMMISSION
ERP	ECONOMIC RECOVERY PROGRAMME
ERR	ECONOMIC RATE OF RETURN
FAO	FOOD AND AGRICULTURAL ORGANISATION OF THE UNITED NATIONS
FRI	FOOD RESEARCH INSTITUTE
GDP	GROSS DOMESTIC PRODUCT
GEPC	GHANA EXPORT PROMOTION COUNCIL
GFDC	GHANA FOOD DISTRIBUTION CORPORATION
GIHOC	GHANA INDUSTRIAL HOLDING CORPORATION
GNTC	GHANA NATIONAL TRADING CORPORATION
GWC	GRAINS WAREHOUSING COMPANY
IBRD	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
IDRC	INTERNATIONAL DEVELOPMENT AND RESEARCH CENTRE
IDA	INTERNATIONAL DEVELOPMENT AGENCY

LIST OF ABBREVIATIONS CONT'D

IFAD	INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT
IMF	INTERNATIONAL MONETARY FUND
ITC	INTERNATIONAL TRADE CENTRE
ITTU	INTERMEDIATE TECHNOLOGY TRANSFER UNIT
MFEP	MINISTRY OF FINANCE AND ECONOMIC PLANNING
MIST	MINISTRY OF INDUSTRIES, SCIENCE AND TECHNOLOGY
MLGCD	MINISTRY OF LOCAL GOVERNMENT AND COMMUNITY DEVELOPMENT
MMB	MEAT MARKETING BOARD
MOA	MINISTRY OF AGRICULTURE
MT	METRIC TONNE
NA	NOT AVAILABLE
NES	NUCLEUS ESTATES AND SMALLHOLDERS
NIC	NEWLY INDUSTRIALISED COUNTRIES
PAMSCAD	PROGRAMME OF ACTION TO MITIGATE THE SOCIAL COSTS OF ADJUSTMENT
PNDC	PROVISIONAL NATIONAL DEFENCE COUNCIL
PPMED	POLICY PLANNING, MONITORING AND EVALUATION DEPARTMENT
R&D	RESEARCH AND DEVELOPMENT
SAP	STRUCTURAL ADJUSTMENT PROGRAMME
SOE	STATE-OWNED ENTERPRISE
TFCC	TEMA FOOD COMPLEX CORPORATION
UAC	UNITED AFRICAN COMPANY
UK	UNITED KINGDOM
UNDP	UNITED NATIONS DEVELOPMENT PROGRAMME
USAID	UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

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AGRICULTURAL MARKETING IN GHANA:
STATUS AND RECOMMENDATIONS FOR IMPROVEMENT

EXECUTIVE SUMMARY
(By Chapter)

CHAPTER I: OVERVIEW OF THE MACRO-ECONOMY AND THE AGRICULTURAL SECTOR

- 1.1 Ghana's economy deteriorated in the 1970s up to the early 1980s primarily because of poor macro-economic policies (overvalued cedi, overprotected industries, lack of fiscal discipline, etc) natural calamities, and the oil crisis.
- 1.2 In 1983, Ghana started an Economic Recovery Programme (ERP) which succeeded in reversing the economic decline and resulted in successive positive growth rates in the economy, including relatively impressive performance in food and agricultural production.
- 1.3 As the ERP progressively moves into further restructuring and policy reforms, agricultural marketing system improvements increasingly deserve serious attention from the government and the private sector, because of the following reasons;
- a) the increasing productivity and production at the farm level is exerting more and more pressures on the marketing system; as the rate of technological adoption continues to improve, more storable and processable surpluses will come out of the farms, which need to be marketed;
 - b) the future productivity gains of ERP and the Structural Adjustment Programme can only enhance farm income if, and only if, the farmers have better market access, options and capabilities. Those are the main attributes of an improved agricultural marketing system, which is the focus of this Report.

CHAPTER II: STRUCTURE AND PERFORMANCE OF THE AGRICULTURAL MARKETING SYSTEM

A) Major Findings on Structure:

1. Dualistic marketing structure: modern

export and traditional food subsystems;

2. Underdeveloped post-harvest handling and storage techniques and facilities;
3. Dualistic agro-processing system: large scale factories in urban centres, and traditional methods in villages;
4. Non-existence of standardization in grading, weights, packaging and labels.
5. Guaranteed Minimum Price policy for rice and maize.
6. Low density and inadequately constructed and maintained market structures at village, district and urban centres.

B) Major Conclusions on Performance:

1. Price variation over time: seasonal/annual price variations.

Maize - wide variation, spread 91%
Rice - moderate variation, spread 40%
Cassava - moderate variation, spread 35%
Yam - moderate variation, spread 40%

2. Price Variation over space (spatial integration.)

- a) Between urban markets: (expressed in % of observations in which prices in two urban markets were highly correlated with r^2 of at least 0.75)

Maize - 75%
Yam - 66%
Cassava - 51%
Tomato - 50%

- b) Farm - Retail Price Spread (expressed as percentage of retail price):

Maize - generally low (3%)
Rice - moderately high (16% - 36%)
Yam - quite high (28% - 67%)

3. Marketing Margins:

- a) Domestically-Produced Commodities

Maize - low
Rice - low

Cassava - high
Gari - high
Groundnut - Moderate

b) Imported Commodities

Wheat - high
Sugar - high
Rice - high

c) Export Crops

Cocoa - high
Coffee - low

4. Marketing Cost Structure: components are ranked in descending order of magnitude:

- a) grains - transport, post-harvest losses, storage
- b) roots - storage, transport, post-harvest losses
- c) oil seeds - transport, storage, post-harvest losses
- d) oil palm - post-harvest losses, processing, transport
- e) traditional - post-harvest losses, exports
storage, transport

Chapter III : PROBLEMS AND CONSTRAINTS

3.1 Infrastructural Constraints

- a) Roads and cargo vehicles
 - . Inadequate feeder roads and vehicles;
 - . Poor condition of existing ones;
 - . Cargo vehicles are inappropriate for fresh fruits and vegetables
- b) Water transport
 - . lack of inland ports
- c) Market structures
 - . Low density
 - . Poor conditions, lay-out and sanitation

- facilities;
- . Poor management system

3.2 Post-harvest Handling Constraints

- a) Storage and drying
 - . Insufficient capacity, particularly on-farm storage;
 - . Too traditional drying and storage methods/equipment result in heavy losses in weight/volume;
 - . Occasional idle storage capacities of SOEs that are wasted due to urban location (far from farmers) and lack of promotion and information about them;
- b) Agroprocessing
 - . Dualistic: large, SOEs are relatively modern; farm-level is primitive;
 - . Processing and preservation techniques that are cost-effective and appropriate to rural areas, are not disseminated effectively
 - . Low participation rate of private sector in modern processing
 - . Unreliable water and electricity supply in the rural areas;

3.3 Pricing

- a) Lack of market integration and farm-market linkages lead to price instabilities (cob-web phenomenon);
- b) Guaranteed Minimum Price for maize and rice sometimes could not be implemented due to low liquidity and lack of storage of GFDC; setting of price policy not always closely linked to quality and border prices;

3.4 Financial Constraints

- a) Lack of own operating capital and credit for marketing activities prevent both farmers and traders from undertaking more storage, drying, and processing functions that add value and utility to the product;
- b) Government's ability to construct market infrastructures is constrained by inadequate fiscal resources, particularly since the SAP requires fiscal prudence;
- c) Weak institutional credit delivery system;

3.5 Facilitating Marketing Services

- a) Inadequate research and extension on marketing techniques, including simple post-harvest handling methods;
- b) Marketing information collected by MOA (PPME) is limited to price and serves more the needs of policy-makers, than those of farmers and traders.

3.6 Institutional Problems

- a) Weak coordination and integration of plans, programs, and policies of the various agencies that affect the marketing system;
- b) Dominance of SOEs in exports and large-scale agro-processing is not conducive to the emergence of private-sector, small-scale agribusiness subsector.
- c) Weak institutional capacity to package and effectively disseminate to the private sector new post-harvest and agro-processing technologies beyond the R & D or pilot stages.
- d) Too much centralization of policies and decisions in Accra.

3.7 Constraints to Expanding External Trade

- a) Inadequate information and contacts with non-traditional markets;
- b) Regional trade (ECOWAS) is constrained by similar factor endowments and inadequate knowledge of comparative advantages;
- c) Production priorities have been emphasizing cereals and tubers more than exportable fruits, vegetables and other horticultural products;
- d) Lack of exporting "hardware" (e.g. cold storage at airport for perishables) and facilitating "software" (simplified procedures, incentives, and policies);
- e) Experience - curve: Ghana's private exporters still not conscious of quality and cost-competitiveness, which are the key success factors of non-traditional, unbranded commodity exporting.

Chapter IV : RECOMMENDATIONS AND OPPORTUNITIES

4.1 Marketing infrastructure

- a) Roads
 - i. Use of communal labour/labour intensive methods in road construction
 - ii. Use of locally available substitute material (eg. limestone) for road construction
 - iii. Effective implementation of yearly programmes of road repair, construction and maintenance under PIP.

- b) Transport vehicles
 - i. Expand the use of alternative means of transportation like the waterways, railways, horse carts, donkey carts where appropriate, thereby increasing market access for producers;
 - ii. Special schemes for cooperative transport ownership, hire purchase agreements and transport pools;
 - iii. Acquisition of vehicles specially built for transportation of perishable and delicate agricultural produce;
 - iv. Continue to waive duty on vehicles for commercial purposes;

- c) Airports and Seaports
 - i. Cold storage for fresh products at Kotoka Airport;
 - ii. Build inland ports;

- d) Market Centres
 - i. Build efficient, cost effective market structures (urban, district, rural), in accordance with the needs of the various areas;
 - ii. Training and technical assistance to market management bodies;

4.2 Post-Harvest Handling

- a) Storage
 - i. Increase on-farm storage capacities
 - ii. Improvement in construction of storage structures
 - iii. Rationalize existing and planned storage capacities of SOEs
 - iv. Strengthen GFDC and GWC capabilities to maintain and manage their facilities

- b) Agroprocessing
 - i. Package and effectively disseminate improved

- processing techniques and machinery to the village and district levels
- ii. Agro-based industries to be linked to the production surplus areas, including fruit and vegetable processing;
 - iii. Replacement or rehabilitation of obsolete processing outfits;

4.3 Financial/Credit Delivery System

- a) Strengthen credit delivery system, especially rural and cooperative banks
- b) Introduce Integrated Agricultural Financing, to include marketing activities, not just production credit.

4.4 Developmental Policies

- a) Macroeconomic policies should be formulated in such a way as to enhance Agricultural marketing
- b) The GMP should encourage grading and post-harvest functions, and GFDC should be given adequate financial and storage capacity to support the GMP.

4.5 Facilitating Services

- a) Extension
 - i. Marketing-oriented extension officers
- b) Market Information
 - i. Improve data collection systems and formats, and regularize their reporting;
 - ii. Market information should not be limited to national boundaries alone but also international data.
 - iii. Marketing information should not serve just the policy-makers but must satisfy needs of farmers and traders.
 - iv. Agricultural Marketing Unit within MOA, but separate from PPME.
- c) Training and Development
 - i. Improve the calibre of extensionists and participants at all levels of the marketing system, through local training.
 - ii. Need for overseas training for professional and middle management levels
- d) Grading and Standardization
 - i. Processing companies and GMP should offer premiums for good quality produce.

- ii. Consumer groups should be organised
 - iii. Government should come up with directives relating to packaging, labelling, etc.
- e) Weights and measures
- i. Metrication committee should revive education drive.
 - ii. Marketing extension officers should educate farmers and cooperative groups on standard measurements.
 - iii. Government agencies involved in the marketing system should insist on purchasing by weights and measures.

4.6 Institutional strengthening of key agencies

- i. Encourage greater coordination of the activities of the various agencies that affect Agric. marketing directly;
- ii. Marketing services division of the PPME should be upgraded to a full departmental status within MOA.
- iii. Policy on key marketing agencies and SOEs should be properly defined and rationalized to justify their continued existence.

4.7. Opportunities and new initiatives

- 1. Expand trade with neighbouring countries and non-traditional overseas markets, based on comparative advantage of Ghana, which would need a rigorous analysis.
- 2. Accelerate non-traditional export promotion by mobilising and organising private sector exporters and helping them with new overseas contacts, quality control, etc.

CHAPTER V: SOME OPPORTUNITY WINDOWS FOR MEANINGFUL USAID ASSISTANCE

5.1 Key criteria for opportunity-scanning

- a) Promote private-sector and micro-enterprise development.
- b) Generate productive employment.

- c) Promote value-added production.
- d) Consistent with USAID resources and experience.
- e) Potential for removing or loosening one or more bottlenecks in marketing system.
- f) Constraint or problem area where there is relative inadequacy of foreign assistance.
- g) Visible and measurable impact over a relatively short period.
- h) Potential for building up managerial capabilities and technical skills of marketing participants/operators.
- i) Potential impact on reducing absolute poverty in the villages, if not income inequality.

5.2

Five Key Recommendations for financial and technical assistance from USAID:

- a) Rural infrastructure, especially feeder roads and village/district markets; Priorities should be based on:
 1. Volume of production
 2. Level of transport costs
 3. Condition of roads and markets
- b) Promotion and support for new small-scale marketing and agribusiness enterprises (private sector individuals or coop) in the rural areas.
 1. This can be a unique area for USAID; time for initiating viable rural agribusiness has come in Ghana due to beneficial ERP/SAP impacts on agriculture.
 2. Assistance areas can include seed capital for start-up; training on entrepreneurship/management; training cum demonstration of simple agro-processing methods.
- c) Systematic collection and dissemination of agricultural marketing information (price, stocks, flows, harvest forecasts, response elasticities by geography and demography).

USAID can:

1. attach an agricultural information expert at MOA for hands-on training of MOA staff on user-oriented, timely information system.
2. install data collection/processing/dissemination scheme between farms and markets;
3. train MOA staff on information gathering, analysis, packaging, dissemination, etc.
4. finance procurement of computers, broadcasting and printing equipment.

d) Promotion of Non-traditional exports and regional trade (ECOWAS):

USAID can:

1. initiate and support a regional study among ECOWAS countries of the distinctive comparative advantages of each country and areas for complementation;
 - . One study team per country;
 - . Prioritize commodities by comparative advantage for each country;
 - . After analysis phase (probably one year), organize a regional conference/workshop to discuss findings and initiate consensus-generation on informal complementation (perhaps in collaboration with ECOWAS secretariat);
 2. Organise and sponsor private sector delegation of exporters from Ghana to the USA and vice-versa; this can encourage other donor countries to sponsor similar exchanges.
 3. Strengthen institutional capability of GEPC in export promotion, international market scanning, simplification of exporting procedures (one-stop service center for exporters), quality control, economical packaging techniques, etc.
- e) Initiate and support an innovative Integrated Agricultural Financing Scheme.

1. Finance feasible and viable marketing and agribusiness enterprises (individuals or cooperatives);
2. Revolving credit-line concept, not production loan for one crop; longer maturity encourages diversification and risk-taking;
3. No interest subsidies, therefore, only financially worthy and viable projects should get credit, and minimize hand-out mentality.

CHAPTER VI: SOME COSTS AND EXPECTED BENEFITS FROM MARKETING SYSTEM IMPROVEMENTS

6.1 Categories of investment requirements:

- a) Physical infrastructures by government and foreign assisted projects;
 - . feeder roads, ports, etc;
 - . market structures: village, district, urban
 - . storage facilities, bulk-handling, cold storage
 - . communication facilities
- b) Physical facilities by private sector
 - . transport vehicles, equipment
 - . small-scale drying and storage facilities;
 - . agro-processing
- c) Credit: loanable funds and delivery costs
- d) Institutional strengthening in key agencies, including training, policy analysis, installation of improved systems and procedures, incentive system, export promotion, etc.

6.2 Large magnitude and interconnectedness of marketing problems/constraints make it impossible to calculate a definitive figure for total investment requirements. Partial estimates can be made of infrastructure requirements based on the public investment program of the Government over three years (1988-91), including foreign assistance, for feeder roads, non-traditional export promotion, rehabilitation of Tema Food Complex, etc.

6.3 The principal expected benefits from the four categories of marketing investments are the following:

- a) Increases in farm productivity as a
 - . direct effect of access roads that increase availability and reduce prices of inputs
 - . indirect motivational and incentive effects of market access and alternatives;
- b) Increases in farm incomes as a
 - . direct effect of more post-harvest functions, market access and destination options;
 - . indirect effect of better market integration
- c) Increased rural employment, due to more marketing activities, greater mobility of labour made possible by new roads, and a general increase in economic dynamism in the rural areas.

6.4 Any effort to quantify the above benefits would require huge expenditures in generating and analysing empirical time-series and cross-sectional data from the villages. Nevertheless, results from empirical studies done in similar countries (India) should provide valuable policy lessons:

- a) other things equal, a freer movement of food grains across rural villages increased aggregate farm productivity up to 5% with a time lag of 2 years;
- b) increased market access generally improved productivity;
- c) among the infrastructure variables, road density had the most significant positive effect on productivity (except in very traditional, food-deficit areas);
- d) fertilizers, irrigation, better varieties, and rainfall all had positive impacts;
- e) all the explanatory variables (inputs, infrastructures, and market access) together explained 80% of the variations in farm productivity;
- f) density of market centres (village, district and urban) positively affected productivity, increasing at a decreasing rate until a saturation point of about 132-161 markets per 100,000 square kilometres (one market per 2,000 sq. km., or radius of about 22 kilometers, yielded an ERR of about 43%)

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6.5 It must be pointed out, however, that market access is not neutral to scale, especially in the short run, so rural income inequalities might initially worsen. But in the medium term, absolute poverty should decrease, and so would income inequalities in the long-run.

CHAPTER I

OVERVIEW OF THE MACRO-ECONOMY AND THE AGRICULTURAL SECTOR

Introduction

- 1.1 Compared with most other countries in Sub-Saharan Africa, Ghana at independence in 1957 enjoyed one of the highest per capita incomes in the region and low inflation. However, pursuance of poor macro-economic policies, natural calamities coupled with increases in oil prices, culminated in a significant decline in the standard of living during the 1970's and early 1980's.
- 1.2 Ghana is well-endowed with natural and human resources. The country is the world's third largest producer of cocoa, which accounts for about two-thirds of the country's export earnings. Ghana also possesses valuable mineral deposits, particularly gold. Hydroelectric power generates most of the electricity, some of which is exported to neighbouring countries. Manufacturing output increased substantially during the 1960's, partly due to government policies that encouraged import substitution industries behind a wall of protection, although capacity utilization and production fell sharply when the economy declined in the 1970's and 1980's. Services are dominated by retail and wholesale trade and account for over a third of GDP.
- 1.3 The deterioration of the Ghanaian economy started steadily in the mid 1960's. This was reflected at several levels. Most notable was the decline in cocoa production despite the fact that the crop still covered over 50% of the cultivated area, provided employment for 24% of the workforce, and accounted for 60% of total exports. Between the mid 1960's to the 1982/83 period, Ghana's share of the world market fell from 30% to 12%. This was attributed to declining real producer prices, (a function of an overvalued exchange rate), non availability of inputs such as insecticides, transportation problems, and smuggling. During this period, food production had also fallen leading to a decline in the food self-sufficiency ratio from 83% in the early half of the 1960's to 72% in 1980. Meanwhile food imports increased by fourfold in the 1970's up to 1982.

- 1.4 Similar problems were faced by the mineral sector, where output of gold, bauxite, manganese and diamonds fell steadily in the 1970's. This was due largely to foreign exchange shortages inhibiting maintenance of the mines and new investment in exploration and development, poor management practices, deterioration of infrastructure, declining ore grades, depletion of reserves, low worker discipline, overvalued currency and smuggling. The overall effect was a sharp decline in Ghana's per capita income by 30% between 1970 and 1982; import volumes fell by a third, real export earnings halved, domestic savings and investment fell to negligible levels while inflation ran at an average of 44% a year.

Economic Recovery Programme

- 1.5 In 1983, the government of the Provisional National Defence Council (PNDC) launched an Economic Recovery Programme (ERP) to reverse the decline in living standards and to restore economic growth through liberalisation. The ERP took the form of an IMF/World Bank-financed programme of economic policies which sought to

- a) shift relative prices in favour of production particularly for export and efficient import substitution;
- b) restore fiscal and monetary discipline
- c) restoration of the country's social and economic infrastructure; and
- d) encourage private investment.

- 1.6 The ERP was designed to proceed in three phases namely:

- a) Stabilisation of the economy in the short-term
- b) Rehabilitation of basic productive capacity in the medium term; and
- c) Liberalisation and growth over the long term.

- 1.7 The period 1983-85 involved the first phase of the ERP. The centerpiece of the reform programme was a move to introduce a more realistic exchange rate. Consequently, the cedi was continuously devalued

from C2.75 per US dollar in April, 1983 to C90 by January, 1986. In September 1986, the Government introduced a second-tier auction system, and in February 1987 the auction and official exchange rates were unified at the then prevailing auction rate of C150 to the US dollar. Currently, the exchange rate has depreciated to C308 to the US dollar (23rd February, 1990).

- 1.8 Price controls were abolished for all but a few commodities. The remaining administered prices, particularly for cocoa and petroleum, have been adjusted at regular intervals to reflect changes in the exchange rate, and widespread price and distribution controls have been abolished. In September 1987, all interest rates were deregulated. In the area of fiscal policy, the Government's efforts have concentrated on eliminating subsidies, mobilizing resources through improved tax collection and selective increases in taxes, and providing more adequately for maintenance and capital expenditures. In addition, Government raised public sector wages and salaries to offset partially the drastic erosion of real incomes in previous years due to inflation.
- 1.9 The cost of the 1983-86 recovery programme was about US\$4.2 billion. More than a third of total spending over this period was on physical infrastructure and almost another third on the fuel and power sector. The rest went to manufacturing and agriculture, among others. Under ERP, as much as 51% of total costs was met with funds from external sources, 35% as aid and 16% on commercial terms.
- 1.10 The policy objectives of the second phase of the ERP (1986-88) reflected the move towards deeper structural reforms. This phase is sometimes known as the Structural Adjustment Programme (SAP) and its principal objectives were continued growth, sustained fiscal and monetary discipline, increased levels of domestic savings and investment, improvements in the efficiency of public resource management and further development of the private sector. To achieve these goals, the Government moved in five broad areas of reform as follows:
- a) Continued deregulation of trade and exchange rate;
 - b) Public resource management;

- c) Cocoa sector policies;
- d) State-owned enterprise reforms;
- e) Public sector management - a key aspect of which was the reduction in the number of surplus civil servants.

1.11 The response of the economy to the ERP was initially crippled by drought in 1983 and insufficient aid flows. Since 1984, however, some progress has been made towards the achievement of the objectives of stabilization and growth. Real GDP grew at an average of 6.0% per annum between 1983 to 1988, and the rate of inflation was brought down from the high levels of early 1980's to 39.8% in 1987.

1.12 While the balance of payment deficit does not occupy an alarming proportion of GDP, the major burden on the economy remains the external debt. The total interest payments on unofficial loans and amortization of official debt have increased by almost US\$200 million yearly in 1983 and 1986. This amounted to over 40% of the total export earnings in 1986. By 1987, the total external debt was US\$2.5 billion.

1.13 Government revenue has improved following increases in exports, the introduction of new taxes, increase in old ones and an improvement in the tax collecting machinery.

1.14 The agricultural sector has also increased its exports of cash crop and food crop production. In the area of infrastructural development, efforts have been made towards the provision, rehabilitation and maintenance of the transport, power, communications and water supply sectors through foreign-assisted projects. Annexes I-1 and I-2 summarise key economic indicators since the inception of the ERP, indicating the upturn in the economy from its low levels prior to the ERP.

Agricultural Sector: Structure and Performance

1.15 Ghana is predominantly an agricultural country with about 70% of its population dependent on agriculture. Agriculture accounted for about 53% of Gross Domestic Product (GDP) over the period 1975-1987. Cereals and root crops account for about 62% of agricultural GDP. Agricultural products also provide about 74% of the nation's total exports. (Annex I-3).

1.16 The country cultivates only a small proportion of its total arable land. Out of 22.3 million hectares, only 2.6 million hectares is under cereal and starchy root crops. Maize is the most important cereal, followed by sorghum and millet; cassava and yam dominate the tubers/root crops group.

1.17 Ghana's agriculture is primarily smallholder-based with more than 67% of all farm holdings less than 2.4 hectares in size and almost 33% less than 0.81 hectares.

Ecological Zones and Production Patterns

1.18 Variations in Ghana's agricultural production arise largely because of climate differences. Three broad ecological zones with homogeneous agricultural endowments and production patterns may be distinguished.

They are the Savannah area in the Northern part of the country, the forest areas in the South, and Savannah Woodlands (transitional zone) between these two areas. Grassland conditions prevail along the littoral in the south. Broadly speaking, these ecological zones run in horizontal bands from east to west.

1.19 In the Northern Savannah region, a marked seasonal distribution of rainfall (1,000 - 2,000 mm) occurs from April to September. The main farm operations are carried out during this period. The crops are harvested between September and January. The main crops are sorghum and millet. The natural grassland vegetation in this area also provides the basis for livestock farming with concentration on cattle production.

1.20 In the Savannah woodland region, there is a single rainy season with a peak in August-September, followed by a marked dry season up to April. The combination of extensive areas of untouched land, sparsity of population, local outbreaks of diseases and pest in livestock as well as water shortage explains the persistence of shifting cultivation in the region. Yam is the major food crop in the region.

1.21 The key features of the forest region are two well-marked rainy seasons with heavy rainfall

(> 2000mm) in the major season which occurs in March-October. Food production in the forest region is based on a cropping system of plantain - cocoyam and maize - cassava.

- 1.22 About 45% of the total food supply originates from small-scale traditional farming operations. The traditional farming system is characterised by low-level production technology and dependence on rains. The principal tools of the small-scale farmers are hand hoes, cutlasses and axes.

Crop Farming Systems

- 1.23 Various forms of farming systems are currently practised in the country due largely to differences in the ecological environment. The dominant farming practice in the country is shifting cultivation with cereals as the major cultivation.
- 1.24 A diversity of shifting cultivation is practised in the country. The system varies between the situation where the cultivator never returns to the same field and other practices involving the systematic return of the farmer to the same plot of land. In Ghana, the cropping patterns of the small-scale farmer have been changing due to the interaction of many factors such as tradition, technological adoption, the physical environment, climate, and economic, social and political considerations.
- 1.25 Mechanised farming is the other form of farming system practised in the country. Farm sizes are generally larger than those under traditional systems. The large-scale farms account for only 5% of the total food production, but they serve as important sources of industrial raw materials.
- 1.26 The block farming concept has also been evolved over time to meet the needs of Ghana's agriculture. Under this concept, sizeable farmlands are formed through negotiations. Essentially, each farmer is allowed to acquire and pay for a piece of land which has been cleared and prepared for planting. This system provides farmers access to facilities such as inputs, credit, services (ploughing & harvesting etc) and marketing. The block farm system benefits from the advantages of large-scale farming and is not limited to any one particular ecological zone.

Livestock Farming

- 1.27 This sector contributed about 7% of agricultural GDP between 1980 and 1984, and supplied about 23% of the national meat requirements in 1986. The livestock population for 1970 and period 1984-86 is shown in Annex I-4.
- 1.28 The West African Shorthorn is the predominant breed of cattle in Ghana which together with its crosses, accounts for about 80% of the national cattle herd. About 16% of the cattle herd are located in the Upper and Northern regions. Sheep and goats are more evenly distributed throughout the country. Pig population has shown a consistent growth during the 1980's.

Fisheries

- 1.29 The fisheries sector can be divided into inland fisheries and marine fisheries. Inland fisheries are mainly concentrated on the Volta Lake.
- 1.30 Marine fisheries can be sub-divided into three types, namely:
- a) Canoe fishery which operates on about 270 landing beaches.
 - b) Inshore fisheries for small trawlers.
 - c) Distant water fishing by large tuna vessels.

Annex I-5 shows the production levels of the fish industry in Ghana from 1983 to 1986.

Performance of Agriculture under the ERP

- 1.31 Agricultural production has grown significantly since 1983 in the livestock, fisheries and food crop sub-sectors (Annex I-6). The improved performance of agriculture was brought about by good weather conditions and an improved incentive policy framework under the ERP. Favourable macroeconomic policies, public investment allocation, as well as deregulation of fertilizers distribution were some of the conducive policies vis-a-vis agriculture.
- 1.32 The ERP has had a remarkable impact on Agricultural land use as shown in Annex I-7.

Areas under cereals and starchy staples have consistently increased since 1983. Land productivity of most cereals with the exception of rice have also shown increases since the inception of the ERP.

1.33 In the livestock and fisheries subsectors, domestic production accounts for only 20% of national requirements. The Ministry of Agriculture has estimated that currently, Ghana is about 85% self-sufficient in most cereals but only 50% self-sufficient in rice.

1.34 Annex I-8 shows the demand and supply situation of cereals in Ghana between 1980 to 1988. Despite production increases in food crops, there have been occasional shortfalls in cereal grain output since 1983. Some of those production shortfalls even got worse after the crops were harvested due to the substantial post-harvest losses during storage. This implies that an agricultural sector needs a good marketing system regardless of Ghana's aggregate surpluses or deficits, as the succeeding chapters will show.

CHAPTER II

STRUCTURE AND PERFORMANCE OF THE AGRICULTURAL MARKETING SYSTEM

- 2.1 The efficiency of the marketing system is crucial to agriculture's transformation from subsistence to a market-oriented one. The system provides inputs to the farmers and an outlet for their products. The components of the market structure discussed in this section include: the marketing channels, the extent of commodity transformation, levels of markets, and pricing. Those elements provide the framework for assessing the performance of the marketing system. The criteria to be employed in this performance assessment cover intra-seasonal and spatial price variations, size of marketing margins, and the quality of services from producer to consumer

THE AGRICULTURAL MARKETING SYSTEM STRUCTURE

- 2.2 Private-Sector Marketing Channel. The private sector channel is dominated by traditional, small-scale, mostly women traders. This traditional system handles over 90% of the domestically produced food marketed in Ghana. It is the system through which commodities like maize, rice, cassava, groundnuts etc. pass before reaching the final consumer. The market consists of a large number of small-scale market intermediaries. Their operational efficiency is low. This is because of lack of managerial skills, physical facilities and facilitating services.
- 2.3 Public Sector Marketing Agencies The state marketing system handles commodities like cocoa, coffee, sheanuts and imported commodities like wheat, sugar, rice, milk, meat and domestic cash crops. For the export commodities the Ghana Cocoa Marketing Board (COCOBOD) and its subsidiaries, the Produce Buying Company (PBC) and the Cocoa Marketing Company (CMC) are responsible for purchases, handling, grading, transportation and export marketing. The PBC has established depots all over the producing areas for the purchase of cocoa, coffee and sheanuts from farmers. Imported sugar, wheat, meat, etc. are handled by the GNPA, GNTC, GFDC and MMB. The GNPA imports and sells wholesale to other buyers. These wholesalers sell

to retailers before the commodities reach the final consumer. The GFDC, GNTC and MMB sell direct to the final consumer or to retailers.

2.4 In addition to the above, other crops are handled by specific agencies such as kenaf by the Bast Fibre Board, cotton by the Ghana Cotton Company, tobacco by the Pioneer Tobacco Company and Tobacco Rehandling Company. Parastatal food marketing agencies such as the GFDC and the Grain Warehousing Company (GWC) handle less than 10% of the marketable grain surplus produced domestically.

2.5 The GFDC was initially set up to purchase, store and sell maize and rice, among other things. Specifically the GFDC was charged with the responsibility of implementing the government guaranteed minimum producer price (GMP) policy for maize and paddy rice. In view of recent events in the country regarding food shortage (1983-84), the GFDC has reoriented her objective to include (a) buffer stock to help achieve year-round food price stability and (b) food storage for emergencies and food security purposes. The GWC was also established initially to store mostly grain for interested organisations and institutions at a modest fee. In recent times, the GWC has entered into local purchasing as a complement to the work of GFDC.

Food Marketing Channels

2.6 The food marketing channels vary depending on the type of commodity, extent of processing, and the location of production and consumption. A typical channel structure for food commodities is: Farmer -> Assembly Trader -> Wholesaler -> Retailer -> Consumer. It is common to find two or more levels of wholesalers in this channel. In such cases, the total marketing costs are higher even if the commodity is from the same source. The channel through which foodstuffs purchased by GFDC are distributed is: Farmer -> GFDC (purchasing assistant) -> Storage Depot -> Retailer (market woman) -> Consumer.

The marketing channel for imported food is; Importer -> Miller (wheat only) -> Wholesaler -> Retailer -> Consumer.

Fig.2.i shows a schematic food marketing channel.

Transport

2.7 Farmers move their produce from their farms to the nearest village, from where it is either sold to the itinerant trader or sent to the nearest rural market for sale. The itinerant trader, after procuring his purchased produce, sends them to an assembling point before despatching them to urban markets. The assembly points could be located in the village, the nearest market or along the major road leading to the urban market. Perishables are normally despatched soon after purchase to the urban centres.

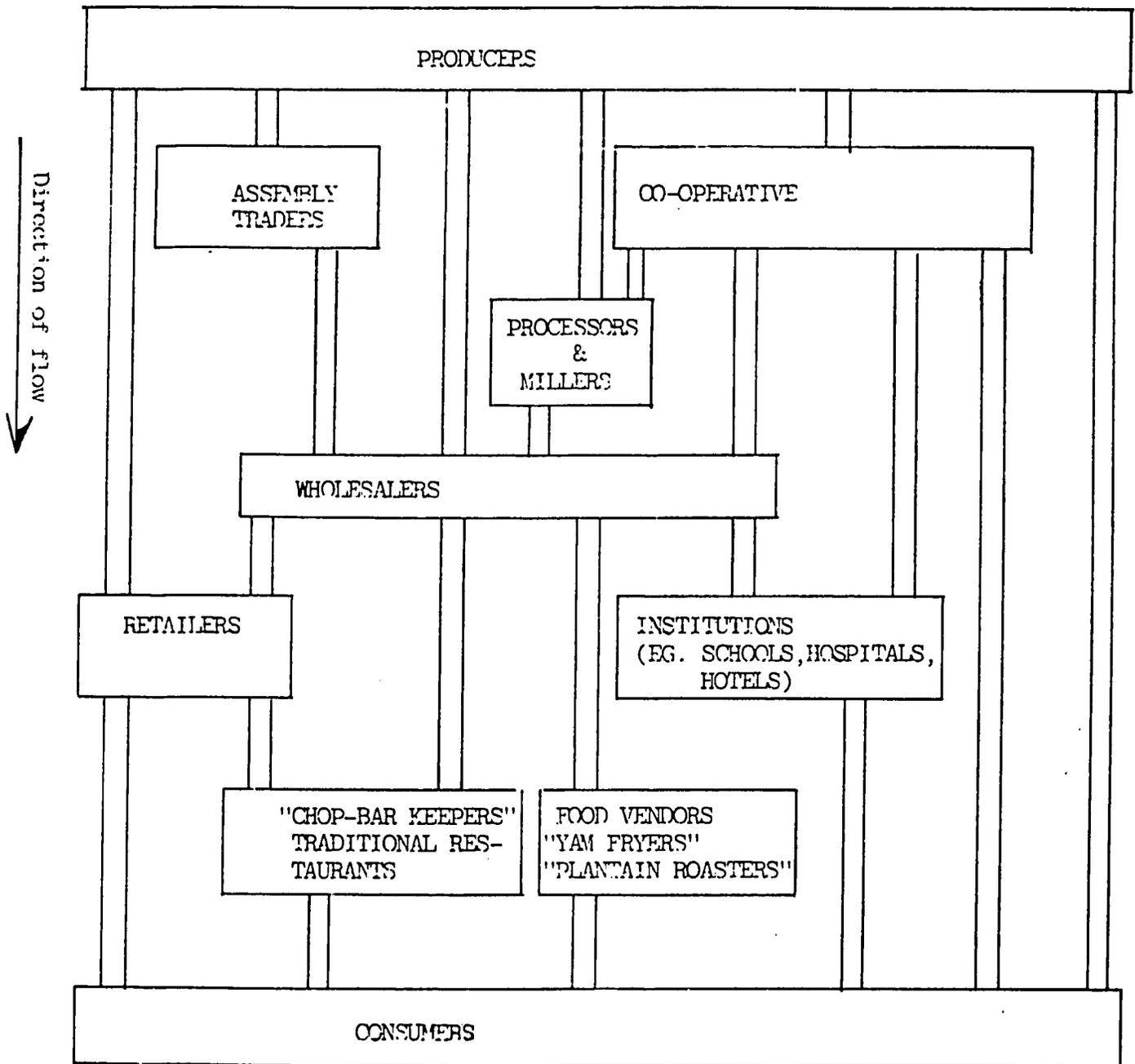
2.8 Whereas most small-scale private traders depend on trucks or truck-owners for moving their purchased produce to the marketing center, the state marketing agencies own their trucks. By owning trucks to haul their purchased produce, the state marketing agencies are able to control transporting time after purchase and also the cost of transportation. The dependence of the bulk of marketed surplus on the general transport system appear to weaken their control over the speed with which produce can be moved to the consuming centres. The owning of transport by crop producers' associations will go a long way to solving the problem of unreliable transportation of commodities. The high transport charges are due to unavailability of transport, bad roads, high cost of petroleum products and spare parts and the inaccessibility of many rural areas during the rainy season. It is generally observed that no proper packaging is done by traders prior to transporting their produce. This, coupled with inappropriately-designed trucks for transportation of food commodities (especially vegetables) results in high post-harvest losses.

Storage

2.9 Post-harvest handling of cereals and roots in Ghana is underdeveloped and is based on simple and inefficient methods. These vary widely across the country. Storage of the grains is carried out by the farmer, the private marketing intermediaries and government marketing agencies. Storage losses are relatively low in the dry northern savannah but higher in the more humid areas. Maize

Fig. 2.i

A SCHEMATIC FOOD MARKETING CHANNEL



produced is stored in the traditional way; stored on the cob for two to three months to dry before shelling, and stored in bags. In recent years, most farmers have planted improved varieties. Planting of higher-yielding varieties of maize which results in higher volumes of output is also associated with higher pest infestation. Thus first harvesting of crops should be early to avoid infestation in the field.

- 2.10 The private traders store their grains in the market stores. These are not specialized facilities for storage. As such, high storage losses occur. This is normally passed on to the final consumer in the form of higher prices. In recognition of this problem, the Post-Harvest Development Unit of the MOA received assistance from FAO to strengthen the MOA staff. These trained staff are expected to assist in the assessment of annual crop losses to enable a more accurate crop availability forecasting after production. In addition, a diploma course in post harvest technology was started in the University of Ghana in 1986 to train personnel for the MOA.
- 2.11 The state marketing system under the GFDC and GWC has modern storage facilities with a capacity of about 45,000 mt., located mainly in Tema and the major maize producing areas of Ashanti, Brong Ahafo and Western Regions. About 133,000 mt of bulk and bagged storage facilities are to be added in two phases with finance provided from the Saudi fund and the Danish International Development Agency.
- 2.12 Yam is the only root crop which can be stored for any length of time after harvest up to six months. Weight losses are as high as 50%. There are no appropriate storage and processing facilities for yam either in the private or public sector. Cassava, also a root crop, has a very short shelf life (one to three days). It is however, processed, using several methods in Ghana. The most common of the cassava processing methods is drying the peeled tuber to make flour "kokonte" or fermenting and frying to produce garri. The starch extract is processed into tapioca or industrial starch. Garri and tapioca can be stored for up to six months in a dry place.

2.13 Formal Agro-processing Subsector

The formal subsector comprises mainly of state-owned and controlled industries and some private industries that use relatively modern machinery and equipment and are large-scale. They process commodities such as pineapples, tomatoes, citrus, maize, rice, groundnuts, cottonseed and cassava, etc. (Table 2a)

- 2.14 These industries, especially the SOEs, were established to act as a market for agricultural commodities and to stimulate increased agricultural production. Since establishment, most of these industries have operated below installed capacity usually because of inadequate raw material supply. In addition, some have become import-dependent. Most of the agro-based industries have serious liquidity problems due to lack of working capital. Part of the problem is due to lack of a clear sales and marketing strategy, poor production planning, lack of spare parts supply for effective maintenance, and inefficient management. These modern industries are mostly located in the urban centres requiring long haulage of raw materials from producing areas. Recovery rates are observed to be low for rice (45-65%) and for palm oil (55%). The combination of underutilization of capacity, inefficient long haulage of bulk raw material, and the low recovery rate is passed on to the final consumer in the form of higher prices. Processing inefficiency can also be due partly to the absence of adequately trained food technologists to operate these industries.

Informal Agro-processing Subsector

- 2.15 This subsector of the agro-processing industry is generally controlled by women. They employ traditional and simple methods to produce foods that are of high demand in the country. The strengths of the informal agro-processing industries include their being widely spread throughout the country, their wider range of commodities than the formal sector, and their orientation toward locally available materials in the villages.
- 2.16 Technologies adopted or employed by the actors in the subsector need no or very little imported input component, making them very competitive in times of

Table 2.a Commodities handled by Agro-Industries in Ghana

Commodity	Formal	Informal
CEREALS		
Maize	+	+
Rice	+	+
Sorghum	-	+
Millet	-	+
LEGUMES		
Cowpea	-	+
Groundnut	+	+
OILSEED		
Cottonseed	+	-
Coconut	+	+
Palm Kernel	+	+
Palm fruit	+	+
ROOTS		
Cassava	+	+
Yam	-	+
STARCHY FRUIT		
Plantain	-	+
FRUITS		
Pinapple	+	+
Oranges	+	+
Lime	+	+
VEGETABLES		
Tomato	+	-
IMPORTED CEREALS		
Wheat	+	+
Barley	+	-
FISH		
Marine	+	+
Freshwater	-	+
MEAT		
	+	+
POULTRY		
	+	-

+ commodity handled - commodity not handled

Source: Sefa-Dedeh S., Kwadzo G.T-M, Plahar W.A.,
 Agro Industries in Ghana
 August 1989 Table 1

foreign exchange crisis. The processing of raw materials in this subsector is quite extensive in coverage. One characteristic of participants in the subsector is that they are more able to cope with fluctuations in commodity price by adjusting their production levels or shifting to the processing of other commodities that appear more profitable. This may be due to the low capital involved and the multipurpose nature of their equipment.

- 2.17 Despite the above strengths, certain weaknesses and constraints are observed within the informal sector. Recovery rates are generally quite low (eg 15.7% for sheanuts) and product quality relatively poor compared with similar imported goods or even those from domestic modern factories. No quality control and standardisation is practiced. These inefficiencies are normally passed on to the consumers in the form of higher prices.

Grading

- 2.18 Grading of food commodities is very rudimentary. At best, they are usually grouped in terms of sizes, colour, and dryness which are not standardized. The consumers are therefore made to pay for produce without being aware of its true value. Traders are likely to take advantage of this situation.

Packaging

- 2.19 Very crude and unsanitary packaging of produce is practised in the traditional food marketing system. Products are offered to the final consumer in old newspapers, banana leaves, etc. Almost all food commodities are handled this way. The purchaser is responsible for providing the appropriate packaging. The same situation is observed for the processed food -garri, palm oil, kernel oil, tapioca, cassava dough, etc. It is only in recent times that some processed foods are sold in transparent polythene bags. The packaging is done at the time of sale. The modern processing factories do packaging. The products are normally decorated with a paper covering the packaging material with only the brand name provided. Fruits and vegetables are canned and labelled. Rice comes normally in 50kg bags and oil in 202 litre drums.

No information is provided as to source and content. Consumers just buy in good faith.

Rural Market Structures

- 2.20 Rural markets are the most primitive in terms of structure and facilities available. Common features of such markets are makeshift structures which cannot stand any rainstorm, gullies created by water erosion within the market, very poor sanitation, lack of toilet facilities, lack of drinking water, lack of proper demarcation among the various produce being sold, fresh produce lying on open, ungravelled ground, and lack of fencing around the perimeter of the market.

Semi-Urban or District Markets

- 2.21 Semi-urban markets are generally located in the district capitals. Most often, a positive correlation exists between the rate of development of the town and physical facilities available in the markets. In many semi-urban markets, toilet facilities and drinking water are available but they are not meant for the market per se. They have been provided for the general use of the inhabitants living within the neighbourhood of the market. Maintenance of the market is usually a serious problem. Most markets within this category have been fenced and attempts have been made to group the traders according to the commodities being handled. These markets are not regulated, are poorly managed, and highly congested especially on market days. The absence of proper management, lack of basic facilities and services, and inadequate space for loading and unloading have hampered the operational efficiencies of the semi-urban markets.

Urban Markets

- 2.22 Urban markets are located in the cities and all the regional capitals of Ghana. They are relatively advanced when compared with the rural markets. Most markets are completely walled with specific entrances. Sellers are grouped to a certain extent, according to produce. Toilet facilities and good drinking water are provided but not well maintained. Like the rural markets, urban markets are poorly managed and highly congested, and lack basic facilities and services.

Pricing Structure

2.23 Price formation in the traditional marketing system depends basically on the demand and supply forces, with attempts here and there towards price-fixing by the crop associations headed by a "commodity queen" in the urban consumer markets. This tends to raise consumer prices higher than it should be in a free market. On the other hand, prices for export commodities are predetermined through negotiations with representatives of farmers, central government, and COCOBOD. The COCOBOD enjoys a legal monopsony with regard to cocoa, coffee and sheanuts.

2.24 Producer Price Support Scheme. The government's domestic price support programme via the GFDC has remained ineffective. Reasons for GFDC's ineffective domestic price support function include: liquidity problems, inadequate staffing, inadequate transport system, lack of storage, and an inefficient management. Because of those problems, the level of GFDC's maize purchase remain small (5-10%) relative to the marketable surplus, despite the fact that in some years the Guaranteed Minimum Price (GMP) has been higher than market prices for maize, as shown in Table 2.b. Data on rice show that the farmgate price has been higher than the GMP from 1983 to 1986.

Consumer Price Stabilization

2.25 Consumer price stabilization through rigid price control has been abolished due to many problems. Current government policy is consumer price stabilization through the maintenance of adequate levels of buffer stock of grains, particularly maize and rice. The buffer stock, however needs to be a substantial proportion of marketable surplus to have a noticeable impact on price. The financial and storage requirements of an effective buffer stock policy would be very high.

Criteria for Setting Administered Prices

2.26 One major price policy instrument in maize and rice, the Guaranteed Minimum Price (GMP), is aimed at reducing price uncertainty for both producers and consumers. The GMP is announced before the start of each cropping season. It enables a farmer who adopts a certain minimum

Table 2.b Produce Prices for Maize and Rice
(Cedis per mt)

	Rice Harvest Season				Maize Harvest Season			
	GMP 1/ Whole- sale	Farmgate 2/ Whole- sale	GMP as proportion of farmgate (%)		GMP	Whole- sale	Farm Gate	GMP as proportion of farmgate (%)
1979	80	170	102	78.4	120	282	169	71.0
1980	100	434	260	38.5	290	599	359	80.8
1981	165	606	363	45.5	420	1 593	955	44.0
1982	500	797	472	105.9	550	2 628	1 576	35.0
1983	1 800	2 294	1 377	130.7	1 000	6 480	3 888	25.7
1984	1 000	1 081	648	154.3	1 800	4 486	2 691	66.9
1985	2 000	1 750	1 050	190.5	2 000	5 273	3 163	63.2
1986	2 600	2 625	1 575	165.1	2 500	7 943	4 765	52.5
1987	4 200	5 387	3 600	116.7	1 000	6 000	3 600	111.1

1/ Guaranteed Minimum Price.

2/ Assumed 60% of wholesale prices.

Source: Ministry of Agriculture.

agronomic practice to earn roughly 25% return on his investment in agriculture. The 25% is made up of 15% profit margin and 10% for risks if the farmer achieves a certain pre-determined yield per hectare for the crop in question. For 1988, the average farmer was expected to achieve a minimum of 22.5 bags of 100kg each (or 2.25 mt) of maize per hectare and 22.5 bags of 82kg each (or 1.8mt) for paddy rice, in order to obtain the 25% returns on his investment.

2.27 The GMP is set on a cost-plus basis. It is composed of the production costs, interest cost at 70% financing level, and 5% each for management and contingency costs.

2.28 The need to produce very high quality maize and paddy rice has made it necessary to institute three prices for Grades A, B and C in 1989. Grade A maize must be free of foreign matter such as stones, dirt and seeds of other crops. Maize that does not meet this measure is sold as Grade B or C. The same applies for paddy rice. Such grading method is not standardized, much less sensitive to fine quality differences. Also, the bulk of marketed maize and rice have their prices determined in the open market where no grading exists except the use of some indication of dryness which is itself not standardized.

Food Imports

2.29 Substantial food production increases have been achieved after 1983. However, Ghana continues to import foods such as wheat, rice, sugar, and milk powder. The GNPA is responsible for the procurement of those imported commodities. Under the current trade liberalization policy, a wide spectrum of food items including rice and sugar can be imported through private channels.

Table 2.c Import and Food Aid of Cereals 1981 - 1988
('000 Metric Tons)

Years	Wheat	Rice	Maize	Total Imports	Food Aid
1981	83.5	31.9	63.9	179.3	80.3
1982	52.7	30.5	10.0	93.2	68.8
1983	60.0	31.1	61.8	152.9	108.8
1984	55.0	50.4	49.3	154.7	102.3
1985	72.0	20.6	0	92.6	97.7
1986	77.0	25.0	0	102.0	76.3
1987	78.0	37.7	10	125.7	81.0
1988	124.2	43.0	0	167.2	70.0

Source: PPMED, MOA.

2.30 The cereal deficits have been covered by large cereal imports through commercial channels as well as through food aid.(Table 2.c). Table 2.d indicates the values of food and live animal imports, compared with the values of cereal imports computed at world prices. The data indicate that food and live animal imports have been quite substantial in the last few years and constituted between 8.8 to 65.6 percent of total imports. In spite of the shortfalls in supply of some staple food items, Ghana exports traditional staples such as yam and plantain, in addition to such non-traditionals as pepper (chilli), ginger, citrus and pineapples mostly to Europe. Such exports have become more important in recent years particularly in line with the export diversification programme under the ERP.

Unofficial Cross-Border Trade

2.31 Ghana is surrounded on three sides by CFA countries and the Atlantic Ocean in the south. Due to the macro-economic policies pursued in the past by the Government of Ghana, the cedi became overvalued and discouraged official export but favoured the development of an active, private cross-border trade. As a result, official exchange reserves declined, and the demand for foreign currency could not be met. A fixed official exchange regime was in operation so the cedi fell in value in the parallel market. (Table 2e). Given the wide

Table 2.d Cost of Cereal and Other Food Imports 1980 - 88

Year	Imports of Food and Live Animals (Cedis mln) (1)	Imports of Food and Live Animals (US\$ mln at Off. Exchange rate) (2)	Value of Cereals Imports ^{4/} (US\$ mln) (3)	Value of Total Merchandize Imports ^{5/} (US\$ mln) (4)	Proportion of Food Imports to Total Imports % (5)	Value of Total Merchandize Exports fob (US\$ mln) (6)	Proportion of Food Imports to Total Merchandize Exports (7)
1980	241.5	87.8	40.7	972	9.0	1 104	9.0
1981	247.3	89.9	32.8	1 021	8.8	711	8.8
1982	276.3	100.5	19.9	631	15.9	641	15.9
1983	1 220.0	353.7	31.2 ₁ (138.4 ₂)	539	65.6	439	65.6
1984	n.a.	123.0 ₁	26.4 ₁	681	18.1	566	18.1
1985	n.a.	123.0 ₁	16.0 ₁	727	16.9	632	16.9
1986	n.a.	133.0 ₁	10.1 ₂	780	17.1	773	17.1
1987	n.a.	n.a.	37.7 ₃	n.a.	n.a.	n.a.	n.a.

^{1/} Computed using marketing year prices, eg. 1983/84 prices used for 1983 figures, etc.

^{2/} Computed using 1985/86 world prices.

^{3/} Based on provisional estimates and using 1985/86 world prices.

^{4/} Computed from data in Quarterly Digest of Statistics, Statistical Service June 1989.

^{5/} Figure for cereal imports (translated at official exchange rates) reported in the 1983 External Trade Statistics

^{6/} World Bank Estimates from, Ghana Towards Structural Adjustment, 1985 Vol I.

Sources: IFAD, Special Programming Mission Report, 1988.

difference between the official and parallel rates, even goods imported at the official rate were re-exported by private individuals. The foreign exchange earned from this trade was partly held abroad.

2.32 Generally, because of the wide gap between the official and parallel market prices, and with strict price controls in force in Ghana, there was strong incentive to sell in neighbouring countries, resulting in huge windfall profits. Trade in all commodities were evident. Food crops were exported to Togo and Burkina Faso, while cocoa went to the Cote d'Ivoire and Togo. The most adverse effect was on cocoa export. This is because COCOBOD, being a parastatal could only pay the farmer at the official exchange rate. According to World Bank estimates, between 45000 and 90000 metric tonnes of cocoa was smuggled annually during the late 1970s and early 1980s.

Table 2.e Exchange rates (Cedis/US Dollar)

Year	Official rate per dollar (1)	Parallel rate per dollar (2)	Ratio (2):(1)
1980	2.75	15.87	5.77
1981	2.75	26.25	9.55
1982	2.75	61.67	22.43
1983	20.33	76.58	22.20
1984	35.99	135.00	4.04
1985	54.37	160.00	2.67
1986	89.21	180.00	2.0
1987	162.37	250.00	1.50
1988	202.35	285.00	1.41
1989	255.85	320.00	1.25
Feb. 1990	305.0	355.00	1.16

Sources: 1. Statistical Service, Quarterly Digest of Statistics various copies.
2. IFAD, Special Programming Mission Report 1988

2.33 With the devaluation and depreciation of the cedi vis-a-vis other foreign currencies, combined with the higher prices paid to the cocoa farmer, the incentive to smuggle has lessened. In addition,

strict control of the borders is in force to stop cocoa smuggling. These factors are believed to have led to greater supply of cocoa being marketed through official channels. Cocoa production has increased from 154,000 metric tons in 1983 to 255,000 metric tons in 1988. Despite these favourable developments, parallel foreign currency markets are still active even with the auction system.

Annual Price Movements

2.34 Rapid annual price increases have characterised the Ghanaian economy in the past decade. Substantial price increases were observed in the late seventies and early eighties but more gentle thereafter. As shown in Table 2.f, whereas the consumer Food Price Indexes for National, Urban and Rural areas have increased about 60 times over the decade, that of combined national consumer price and minimum wage indexes have increased about 80 and 46 times, respectively. The implications are that because of the more rapid food price increases than the wage increases, the real income of wage earners have been steadily eroded, which have a negative welfare effect.

Table 2.f Consumer Food Price Index (1977 = 100)

Year	Wages	National (1)	Urban (2)	Rural (3)	Combined National (4)
1978	141.0	159.4	163.8	155.0	173.1
1979	166.3	257.7	248.7	266.8	267.3
1980	244.4	392.5	342.2	442.7	401.2
1981	407.4	828.8	755.2	903.3	868.7
1982	410.3	1125.4	1059.3	1212.8	1062.4
1983	558.2	2754.6	2645.9	2863.2	2367.4
1984	1039.1	3058.5	2932.4	3178.4	3304.2
1985	2229.7	2717.7	2496.1	2939.4	3647.2
1986	3077.3	3268.8	3000.1	3537.4	4543.1
1987	3600.5	4527.1	4279.5	4774.8	6352.0
1988	4650.1	6071.0	5859.1	6283.0	8343.9

Source: Republic of Ghana, Quarterly Digest of Statistics
Vol.VII No.1 March 1989.

Note: (1) National food price index
(2) Urban food price index
(3) Rural food price index
(4) Aggregate consumer price index

PERFORMANCE OF THE AGRICULTURAL MARKETING SYSTEM

- 2.35 Against the background of the agricultural marketing structure, we analysed the efficiency performance of the marketing system. The criteria used in assessing the performance include price variation over time (temporal); price variation over space (spatial integration); structure of margins and costs; and the quality of services. In an efficient market, there is a high degree of price integration over space and time. The assessment would provide a basis to identify constraints and potentials, and suggest possible improvements.

Temporal Price Variations

- 2.36 Very substantial price variability within the marketing year is exhibited in the staple food markets in Ghana. For the storable cereals like maize and rice, the prices in the lean season are usually much higher than at harvest time. Table 2.g and Fig.2.ii illustrate the average wholesale prices for maize, rice, cassava, and yam. In eight out of 9 seasons for maize, the lean season prices were more than 100 percent higher than the harvest time prices. In the case of rice, the pattern is less pronounced except for the period 1979 -83. The low values for the 1983/84 season is because in this year of extreme drought, food aid started arriving in the middle of 1984, depressing national prices in the lean season.
- 2.37 Staple rootcrops with very short storage life after harvest, such as cassava and yam, exhibited very substantial price variations only in the drought year 1982/83 (Table 2.h and Fig.2.iii) The following year, due probably to the inflow of food aid, the normal lean season prices were lower than the harvest season prices. Generally, inter-seasonal price variations are more moderate with the rootcrops. This may be due to the availability of short-season varieties (6 months) of cassava which means two harvests can be achieved in a year. Similarly, yam in the Brong Ahafo Region is normally harvested in February, which augments the supply from the Northern Region and the Volta Region harvests between September and October.
- 2.38 The wholesale price index for maize in September was 85 as compared with 176 in June (the highest index).

Table 2.9 Intra-Seasonal Variation of Monthly National Wholesale Prices of Maize and Rice, 1979 -1988

(Prices in cedis per bag)

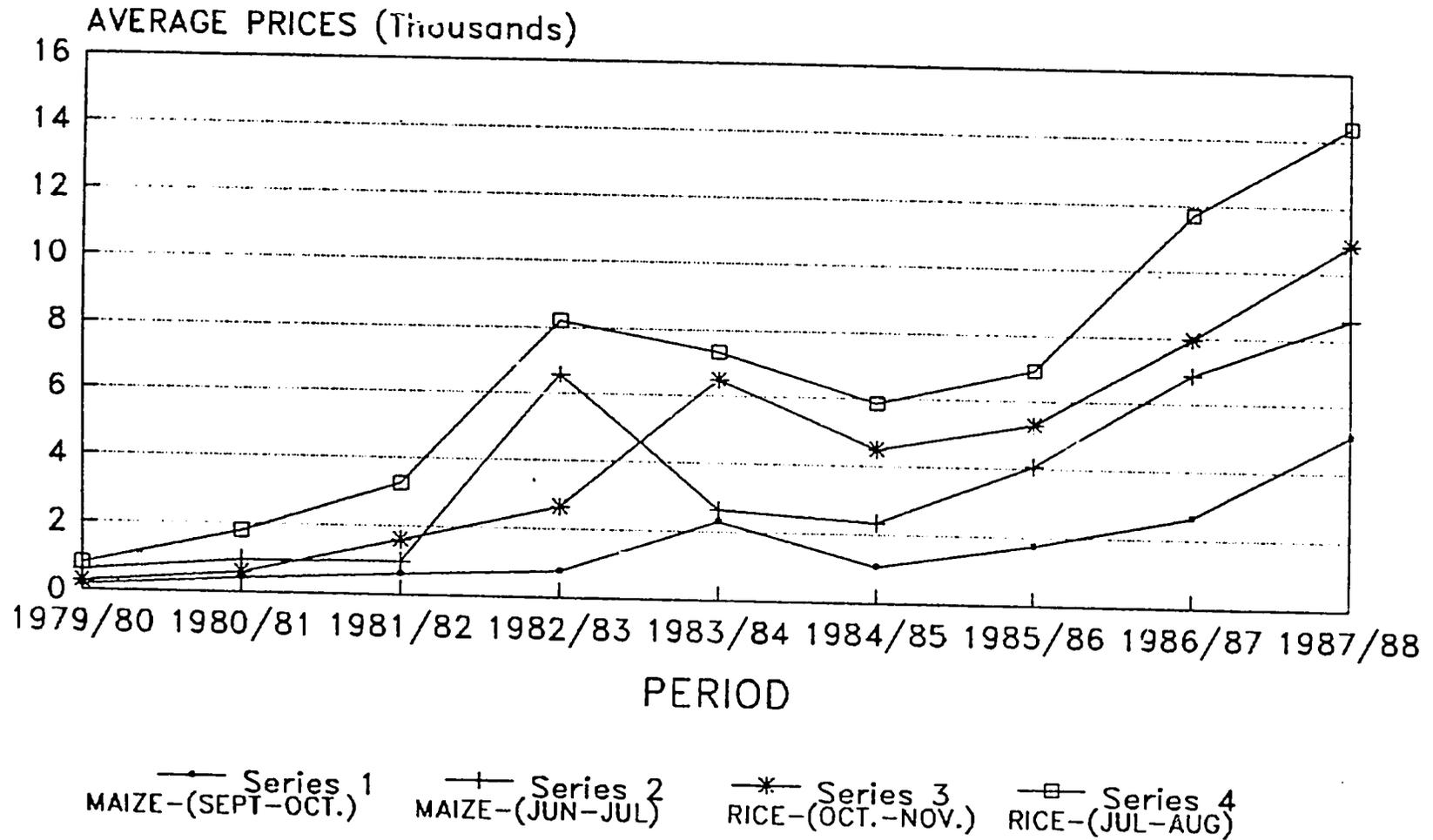
Year	Maize				Rice			
	%age Diff. b/n Min. & Max. Mthly Prices w/n Mktng Yr.	Ave.Price Sept-Oct.	Ave.Price June-July	%age Diff. b/n late & early season Prices 3/	%age Diff. b/n Min. & Max. Mthly Prices w/n Mktng Yr.	Ave.Price Oct-Nov	Ave.Price July-Aug	%age Diff. b/n late & early season Prices 3/
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1979/80	340.6	170.7	605.6	254.7	301.4	282.1	795.8	182.1
1980/81	168.9	434.1	952.0	119.3	327.7	599.3	1789.1	198.5
1981/82	100.6	606.3	974.4	60.6	268.4	1593.5	3231.8	102.8
1982/83	974.0	787.5	6552.5	732.0	266.0	2628.8	8204.2	212.0
1983/84	79.5	2294.4	2627.9	14.5	45.3	6480.6	7329.1	13.0
1984/85	159.5	1082.0	2338.4	116.1	33.6	4485.4	5849.2	30.3
1985/86	167.9	1750.8	4054.0	131.6	90.2	5273.2	6921.2	31.3
1986/87	225.2	2625.0	6852.0	161.0	78.2	7943.5	11706.0	47.4
1987/88	108.2	5068.0	8578.0	69.3	51.3	10850.0	14384.2	32.6

Source: Computed from data provided by PPHE, MOA.

- Notes: a) A bag of maize is 100kg, a bag of rice is 93kg.
 b) The Marketing Year for Maize was assumed to be August-July, while that for rice was assumed to be October-September.
 c) (4) = [(3) - (2)] x 100 / (2), Similarly column (8) = [(7) - (6)] x 100 / (6)

Fig. 2ii

Intra-Seasonal Var. of Monthly Wholesale Prices of Maize and Rice, 1979-1988



Prices in cedis per bag

Table 2.n Intra-Seasonal Variation of Monthly National Wholesale Prices of Cassava and Yam, 1980 -1988

(Prices in cedis per unit)

Year	Cassava				Yam			
	%age Diff. b/n Min. & Max. Mthly Prices w/n Mktng Yr.	Ave. Price Aug-Oct.	Ave. Price May-June	%age Diff. b/n late & early season Prices 3/	%age Diff. b/n Min. & Max. Mthly Prices w/n Mktng Yr.	Ave. Price Oct-Nov	Ave. Price July-Aug	%age Diff. b/n late & early season Prices 3/
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1980/81	247.3	176.5	356	108.5	143.8	1000.5	1903.5	90.3
1981/82	46.4	424.5	328.5	-22.6	141.4	1400.0	2749.0	96.4
1982/83	675.9	336.0	224.6	565.1	404.6	2304	8973.5	289.5
1983/84	184.2	1694.5	1037.5	-45.2	68.7	8429	5905.0	-29.9
1984/85	109.3	764.5	947	23.9	106.4	5546.5	7290.0	131.4
1985/86	138.0	652.5	1358.5	108.2	97.9	6044.5	9849.0	62.9
1986/87	159.9	1626.0	3490.5	114.4	91.5	91.5	11415.5	21.30
1987/88	41.8	3573.5	2696.0	-19.0	178.9	10456.5	20748.0	98.4

Source: Computed from data provided by PPME, MOA

Note: 1. Measure of cassava unit is 91kg. 100 tubers of yam average 280 kg.

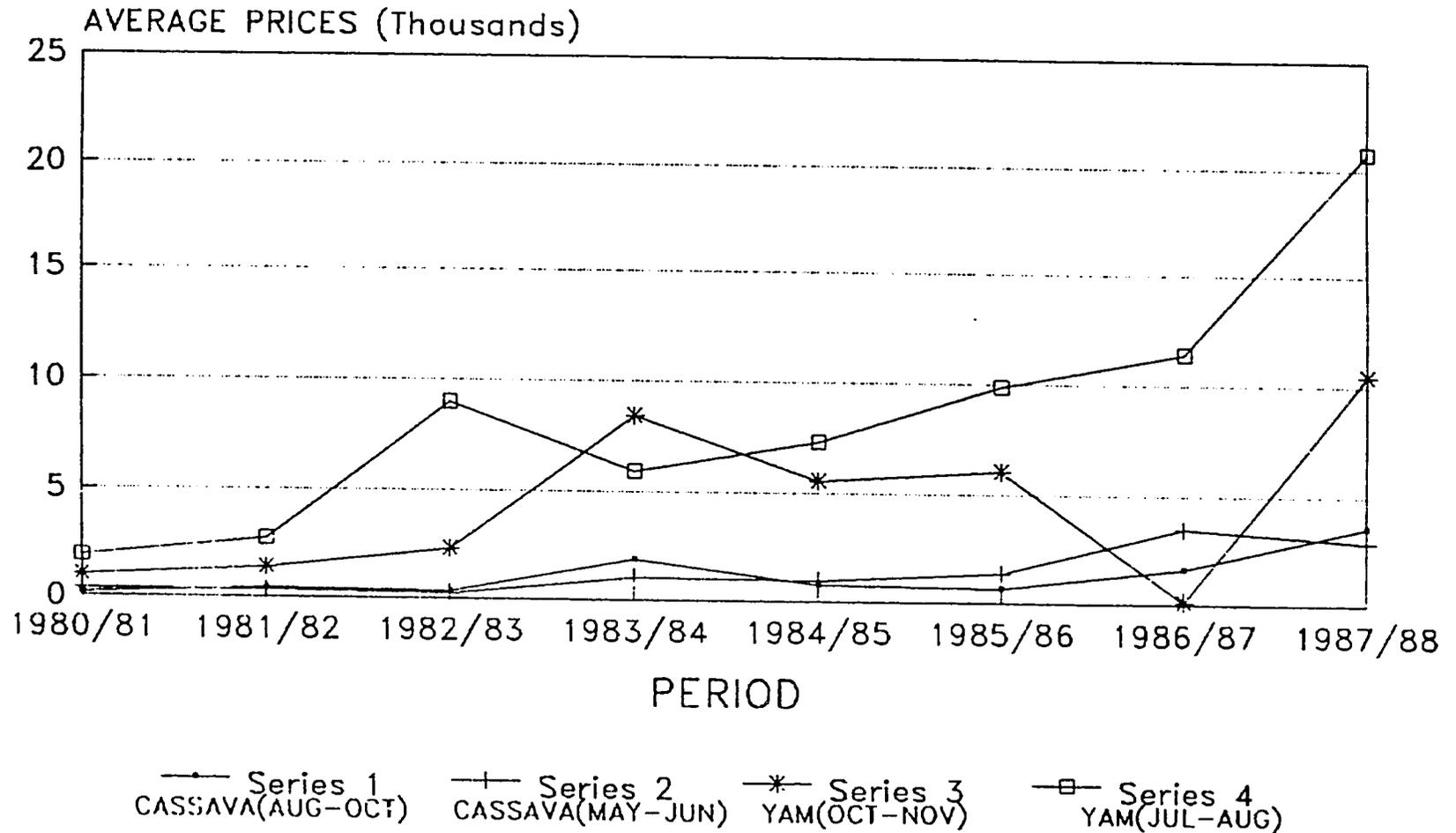
2. Calculations of the price variation indexes:

$$a) \text{ Column (4)} = \frac{[(3) - (2)] 100}{(2)}$$

$$b) \text{ Column (8)} = \frac{[(7) - (6)] 100}{(6)}$$

Fig 2iii

Intra-Seasonal Var. of Monthly Wholesale Prices of Cassava and Yam, 1980-1988



Prices in cedis per Unit

The price spread between the period just before harvest and just after harvest is 107 percent. Based on a study on the economics of grain storage in the northern region, we calculated that 30.3 and 76.7 percent of the high price spread for maize consisted of profit and storage costs, respectively. Where the avenue exists, maize producers who harvest early in the year may be better off to sell by July. The net benefit from such "off-season" production is higher prices for producers.

2.39 The price spread for rice is lower (40 percent), of which one-third is storage cost and the rest was profit. The seasonal price spread as shown in Table 2.i and Fig.2.iv is lowest in January, which is the peak harvesting period for rice produced in the north. The availability of other foodstuffs eg. maize, during the period immediately before rice harvest and the arrival of substantial amounts of imported rice (commercial and food aid) which coincide with this time of the year serve to dampen the seasonal price movements for rice.

2.40 Yam is mainly grown in the Northern, Brong Ahafo and the Volta Regions. Harvesting normally reaches its peak in October-November. The seasonal price of yam does not peak just before harvest as was the case with maize. The wholesale price index for yam peaks (140) between May-July, followed by a sharp decline in August-September.

Table 2.1 Seasonal Wholesale Price Index for Selected Commodities (1980-88)

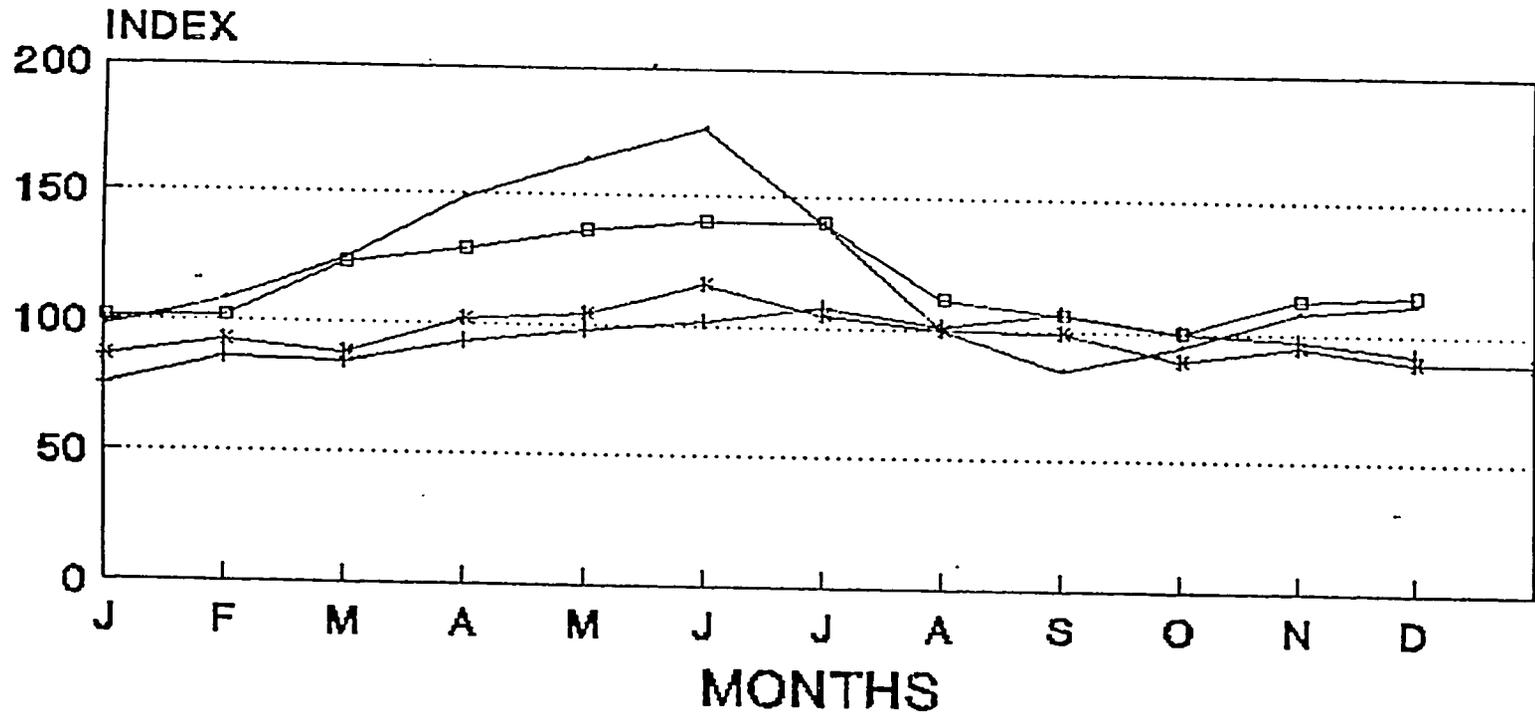
Crop	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Price Spread %
Maize	97	108	124	143	153	175	140	100	85	94	106	112	107
Rice	76.6	85.7	84.8	93.2	87.2	102	107.7	101	106.9	100	97.5	92.3	42
Cassava	86	92	98	102	104	115	105	100	99	29	95	89	35
Yam	101	102	123	122	135	140	140	112	106	100	113	115	40

Source: Computed from data provide by PPME, MOA.

Note: Price spread was calculated as

$$\frac{\text{Maximum index} - \text{Minimum index}}{\text{Minimum index}}$$

SEASONAL PRICE VARIATION INDEX FOR SELECTED COMMODITIES



— Series 1 MAIZE

+ Series 2 RICE

* Series 3 CASSAVA

□ Series 4 YAM

Table 2.j Seasonal price spread comparison for maize, rice, cassava and yam (1980 = 1989)

Crop	Lowest Wholesale Price Index	Highest Wholesale Price Index	Spread (Highest-Lowest)	Spread as % of Lowest Wholesale Price Index
Maize	85	176	91	107
Rice	77	108	31	40
Cassava	86	116	30	35
Yam	100	140	40	40

Source: Computed from Table 2.i.

- 2.41 Among the crops under study, cassava shows the least price variation of 35% within the season. The wholesale price index peaks in June (116) like maize and yam, and is lowest (86) in January. The reason for this may be partly due to the fact that cassava can be planted throughout the year, availability of short (6 months) and long (12 months or more) season varieties, and the ease with which it can be processed into garri, starch, tapioca and cassava powder (kokonte).
- 2.42 Table 2.j shows that the variation in price is largest for maize and smallest for cassava while that for rice and yam (40) was not significantly different. The wide price spread for maize may be due to the fact that maize availability follows the traditional seasonal production and supply pattern. On the other hand, rice, cassava and yam exhibit different seasonal price variations.
- 2.43 In summary, the seasonal price variations suggest that other factors aside from storage costs may explain the inter-temporal price variations for maize, rice, yam and cassava. Based on storage costs alone, one would have expected the peak price for rice to occur in September. Cassava and yam, which are more perishable crops, exhibit more gentle price spreads. This is due to their being less seasonal than grains.

Spatial Market Integration

- 2.44 Where the marketing system operates efficiently, wholesale prices in various markets should be highly correlated in movement. In Ghana, the various urban markets are relatively near each other. The distance between Wa and Accra, two most separated urban markets, is about 717km. It takes only about a week or less by truck and other means to move produce from the Upper region to Accra even under the worst of weather conditions. As such, the expectation is that prices in major marketing centres should move together. However, our empirical studies show that this is not necessarily the case.
- 2.45 The correlation coefficients for pairs of markets obtained from our analysis, which considered wholesale prices for maize, rice, cassava, yam and tomato for different markets, are presented in Table 2.k. The results show that the cereal markets in Ghana are correlated to a great extent. Over 75 percent of the cereal markets show correlation coefficients of 0.75 or above. In spite of the limitation to the approach used in testing spatial integration, the results clearly show that there is a strong linkage of the cereal markets studied. In the case of the root crops, 66 and 51 percent for yam and cassava, respectively, showed correlation co-efficients of 0.75 or above. The implication is that the market linkage is weaker for these commodities. Tomato showed the weakest linkage between markets. Only 50 percent of the correlation coefficients were 0.75 or more. These results, especially for the grains, are corroborated by other earlier studies on spatial integration of selected food crops in Ghana.
- 2.46 Additional analysis was made using monthly wholesale price data in six rural producing and three urban consuming markets for the period 1984 to 1988 for maize, rice, yam, garri, cassava and tomato. Pairwise percentage differences between the prices of the various markets were computed. Where prices in different markets move in unison, the percentage difference of monthly prices across regions/markets should not vary considerably and therefore, the standard deviation of these price differences should be relatively low.

Table 2.k. Correlation of wholesale prices among pairs of markets in Ghana 1984 - 88

Correlation co-efficient	<u>Number of market pairs with corresponding correlation coefficients</u>				
	Maize	Rice	Yam	Cassava	Tomato
0.950-1	20	12	10	17	11
0.900-0.949	11	6	2	3	2
0.850-0.899	8	7	6	2	6
0.800-0.849	2	9	4	1	4
0.750-0.799	3	4	8	3	4
0.700-0.749	3	3	4	2	6
0.650-0.699	3	2	3	2	3
0.600-0.649	2	1	2	0	2
0.550-0.599	3	1	1	1	3
0.500-0.549	0	1	1	1	3
0.00 -0.499	0	6	4	19	10
<u>Total no. of pair markets</u>	<u>55</u>	<u>52</u>	<u>45</u>	<u>51</u>	<u>54</u>
<u>Percentage of total pairs with corresponding correlation coefficients.</u>					
Correlation co-efficient	Maize	Rice	Yam	Cassava	Tomato
0.950-1	36.36	22.22	22.22	33.33	20.04
0.900-0.949	20.00	11.11	4.44	5.88	3.70
0.850-0.899	14.55	12.96	13.33	3.92	11.11
0.800-0.849	3.64	16.67	8.89	1.96	7.41
0.750-0.799	5.46	7.41	17.78	5.88	7.41
0.700-0.749	5.46	5.56	8.89	3.92	11.11
0.650-0.699	5.46	3.70	6.67	3.92	5.56
0.600-0.649	3.64	1.85	4.44	0	3.70
0.550-0.599	5.46	1.85	2.22	1.96	5.56
0.500-0.549	0	1.85	2.22	1.96	5.56
0.00 -0.499	0	11.11	8.89	37.26	18.52

Source: Computed from data obtained from PPMED, MOA, Accra. See Annex II 2-6 for details.

2.47 Annex II.1 shows the mean, minimum, maximum, and the standard deviation values of the percentage differences between major urban consuming centres and major rural producing areas. All these

differences are expected to be positive on the average as the commodities generally flow from rural to urban centres. Similarly the range between the minimum and maximum values should not be too large and the standard deviations should be small if there is a continuous flow from rural to urban areas.

- 2.48 For almost all commodities, counter-intuitive relationships were observed. As a result, 21 of the 105 pairwise percentage price differences yielded negative mean values. (Annex II.I) This can be explained by the fact that the major staple cereal imports under food aid are distributed mainly in the urban areas. Secondly, the production of some staple crops in the rural areas is limited, but at the same time we experience a high concentration of these produce in the urban centres which depresses prices. This is particularly true for Accra. Similar arguments can be given for cassava prices between Ashanti urban -Accra rural, Ashanti urban -Northern rural and Eastern urban -Upper East rural. The same observation is made for price relationship between Eastern urban - Accra rural for tomato. Cassava for garri production is not cultivated in the Upper East Region. As such the mean price differences between the Upper East rural and the urban centres are all negative.
- 2.49 The ranges between the highest and lowest percentage of spatial price difference for a given product and market are substantial. For example, the difference between the highest and lowest observed percentage price difference between the Accra Urban, Ashanti Urban and Eastern Urban on the one hand and Brong Ahafo rural on the other, are more than 100 percent. The spread covers transport, storage, losses and profit.
- 2.50 The highest range of 1,733 percent is observed between Eastern Urban and Brong Ahafo rural for garri. The standard deviations are quite substantial. This implies that very large variations in the monthly differences in prices between the pair centres exist. By restricting the analysis to months just after or before harvest for the cereals, the distributions narrow but the general pattern stays the same. It thus appears from the above analysis that markets for staple food crops are not very well integrated spatially.

Farm - Retail Price Spread

2.51

A farm-retail price spread is the difference between the retail price of a product and its farm price. It indicates the farmer's share of the consumer's cedi. Generally, the price spread includes the actual costs and profits enjoyed by the intermediaries from farmers to consumers. These charges include the payments for such services as assembly of raw material from scattered farms, sorting, grading and processing, packaging, storage and transportation. Price spreads have been shown in various studies to have either of the following relationships:

- a) Constant percentage spread, that is
 $M_o = K P(r)$, though it is not necessary to assume that the percentage remains the same for all levels of transaction.

$$\text{Therefore } P(r) = P(f) + KP(r)$$

$$\text{or } P(f) = (1 - K)P(r)$$

Where
 $P(r)$ = retail price
 $P(f)$ = farm gate price, and
 K = percentage of retail price (parameter)
 M_o = margin

- b) Absolute spread: Add a specific amount to farm gate price to obtain retail price.
That is $p(r) = p(f) + M_o$
- c) Price spread and quantity handled. It is assumed that the price spread is a linear function of the quantity handled (q).

$$M = a + bq.$$

$$\text{Thus } p^r = a + bq + p(f)$$

2.52

Despite the fact that the three models stated above could suit various situations, it seems appropriate to assume that price spreads are determined by a combination of percentage and absolute margins. It is generally observed that while wholesalers use constant percentage mark-up, retailers make use of absolute margins. Thus, the margin, expressed as a linear function of retail prices, takes the following form: $M_j = L_j + B_j P_j(r)$

Table 2.1. Marketing Margin as a Function of Retail Price (95% Confidence Level)

Brong Ahafo Rural MAIZE

Consumption Location	Regression Estimates		
	L	B	R ²
Accra	633 (not sig)	-0.03 (sig)	76.6
Sekondi/Takoradi	180 (not sig)	0.18 (sig)	67.0
Kumasi	1293 (sig)	-0.24 (sig)	84.6
Tamale	-678 (not sig)	0.03 (sig)	48.0

Source: Annex II-7 Table a

Northern Rural RICE

Consumption Location	Regression Estimates		
	L	B	R ²
Accra	-4264 (sig)	-0.61 (sig)	35.1
Sekondi/Takoradi	2736 (not sig)	0.16 (sig)	36.8
Kumasi	95 (not sig)	0.27 (sig)	62.0
Tamale	-1781 (not sig)	0.28 (sig)	58.4

Source: Annex II-7 Table b

Brong Ahafo Rural YAM

Consumption Location	Regression Estimates		
	L	B	R ²
Accra	1506 (not sig)	-0.03 (sig)	58.4
Sekondi/Takoradi	-5507 (not sig)	0.70 (sig)	14.7
Kumasi	-1343 (not sig)	0.32 (sig)	48.2
Tamale	-4407 (not sig)	0.18 (sig)	50.6

Source: Annex II-7 Table c

Northern Rural YAM

Consumption Location	Regression Estimates		
	L	B	R ²
Accra	3653 (not sig)	0.44 (sig)	70.0
Sekondi/Takoradi	-445 (not sig)	0.67 (sig)	43.0
Kumasi	3381 (sig)	0.31 (sig)	71.7
Tamale	317 (not sig)	0.28 (sig)	77.6

Source: Annex II-7 Table d

Where M_j = margin on commodity j .
 L_j = absolute component, and
 B_j = percentage component

- 2.53 The attempt here is to verify whether the general relationship that marketing margin is a linear function of a fixed absolute amount, L_j and a fixed percentage B_j of the retail price $P_j(r)$, applies to the Ghanaian market for maize, yam and rice.
- 2.54 Maize The results of the analysis show that in the local market, marketing margins for maize generally obey the relationship $M_j = B_j P_j(r)$ at 95 percent confidence level except for the Kumasi market which shows the relationship $M_j = L_j + B_j P_j(r)$. Using the results in Table 2.7, the marketing margin for maize has been estimated to be about 3 percent of the retail price for Accra, Kumasi and Tamale, but 18 percent for Sekondi-Takoradi. The variation in marketing margin is a reflection of seasonal changes in prices resulting from seasonal variations in the availability of agricultural produce. The ability to store maize reduces price variations and maintain low and relatively constant marketing margins.
- 2.55 Rice The regression results in Table 2.7 show that the relationship of the marketing margin and retail price can be expressed as $M_j = B_j P_j(r)$ except for the Accra Rice Market, for which the model $M_j = L_j + B_j P_j(r)$ applies. The estimated marketing margin as a proportion of retail prices are: 16% for Sekondi-Takoradi, 27% for Kumasi, 28% for Tamale and 36% for Accra in 1988. The higher marketing margins in rice relative to maize may be partly due to the premium status given to rice by the Ghanaian consumer.
- 2.56 Yam The results obtained for yam from both Northern and Brong Ahafo rural markets are similar. They show that the relationship of the marketing margin and retail price can be expressed as follows: $M_j = B_j P_j(r)$ (Table 2.7). The marketing margin is highest for Sekondi-Takoradi, followed by Accra, Kumasi and Tamale in that order.
- 2.57 In an earlier section, it was shown that price fluctuations follow a seasonal pattern. This price fluctuation was highest for maize followed by rice and yam, in that order. (Table 2.i). This implies that the marketing functions of storage and

processing are too weak to dampen the price movements of perishable products.

Structure of Marketing Margins and Costs

- 2.58 Generally, due to the inefficient marketing system in Ghana, marketing margins take up a huge proportion of the consumer cedi despite very little and poor quality of services between the farmer and the consumer. Estimates of the marketing margin for various commodities ranged from 17% for paddy rice to 82% for gari, and from 27% for coffee to 58% for cocoa. These estimates are presented in more detail in Annex II-8.

Marketing Margins for Domestically-Produced Foods

- 2.59 The marketing margin as percentage of consumer price varies widely (Annex II-9.) For grains, maize and rice in particular, the marketing margins are low relative to the retail price (lower than 34%). On the other hand, the margin for cassava is quite substantial (over 66%) and moderate for groundnuts (40 - 47%). The highest marketing margin (82%) was found in gari, due probably to processing.
- 2.60 Further analysis shows that over 90% of the marketing margin in maize and rice, is attributable to actual marketing costs. Thus, the profit mark-up on these crops appear to be small. Estimates of actual marketing costs for cassava range between 56% -58% and that for groundnuts 40-47%. These imply that profits are higher for these commodities than for maize and rice. However, gari, a derivative of cassava, appears to yield the highest profit margin.

The possible explanations for why traders in groundnuts and cassava appear to reap higher profits relative to rice and maize traders are the following:

- a) Maize and rice trading is more competitive because they are more atomistic;
- b) More information flows in the market about price and availability of rice and maize.
- c) There is relatively more market integration in the case of maize and rice.

- d) Groundnuts (and to some extent cassava) appear to have a thinner market. Groundnuts have less turnover than most staples.
- e) Groundnuts and cassava are more perishable and susceptible to spoilage and toxicity, so more spoilage risk, and
- f) Possibly oligopolistic and manipulative practises in the groundnut market.

The possible explanations for the higher profit associated with trading in gari relative to palm oil, which are both processed products are:

- a) The staple nature of gari relative to palm oil.
- b) Palm oil has numerous vegetable oil substitutes on the market, and
- c) The higher loss associated with the processing of palm oil.

Marketing Margins for Imported Foods

- 2.61 Marketing margins are generally smaller in imported foods relative to domestically produced and consumed ones. The marketing margin is about 75% for wheat, 64% for sugar, and 57% for rice. Of these margins, 55.3%, 26.4%, 61.2% and 48.4% are eaten up by actual marketing costs for wheat, wheat flour, sugar, and rice, respectively. This implies that milled flour yielded the highest profit to the marketing agents. This is due partly to value-added in processing. Imported rice appears to generate a higher profit than local rice, probably because of better quality.

Marketing Margins for Export Commodities

- 2.62 The commodities analysed here are cocoa and coffee. Generally, marketing margin up to the Tema port is about 58% and 27% of the FOB prices for cocoa and coffee, respectively. These imply that the profit level is higher in cocoa than in coffee. The possible explanation is the outright monopoly over cocoa by the COCOBOD.
- 2.63 Generally, actual marketing costs as proportion of the marketing margin are highest for domestically produced and consumed commodities and lower for export commodities like cocoa.

Table 2.m. Percentage Distribution of Marketing cost for selected crops and locations

Producing Point	Consuming Point	Distance km.	Commodity	Transport	Storage	Processing km.	Market toll	Losses	Unspecified
<u>Producers to Consumers (Domestically - Produced Foods)</u>									
Mampong (AsR)	Accra	340	Maize	37.88	22.08	-	2.81	23.99	13.24
Techiman (BAR)	Accra*	416	Maize	40.53	31.53	-	4.87	23.07	-
Tamale (NR)	Accra	560	Local rice	26.20	35.12	13.60	-	18.06	7.02
Mampong (AsR)	Accra	340	Fresh cass.	30.54	42.34	-	7.71	12.56	7.05
Techiman (BAR)	Accra	416	Fresh cass.	33.64	37.43	-	8.64	11.55	8.74
Techiman (BAR)	Accra	416	Garr:	19.95	29.83	32.17	4.16	11.34	2.54
Tamale (NR)	Accra	560	Groundnuts	37.54	39.97	-	2.76	19.62	-
Mampong (AsR)	Accra	324	Groundnuts	45.60	38.09	-	7.42	22.30	-
Kade (ER)	Accra	120	Palm Oil	12.86	10.67	32.89	-	39.95	3.71
<u>Importers to Consumers (Imported Foods)</u>									
Tema Harbour	Kumasi	299	Wheat	18.71	18.30	36.99	-	1.20	24.56
Tema Harbour	Kumasi	299	Sugar	8.21	6.92	-	-	10.57	74.30
Tema Harbour	Kumasi	299	Imp. rice	17.22	5.63	-	-	10.84	66.31
<u>Producers to Exporters (Export Commodities)</u>									
Nsuta	Tema port	367	Cocoa	27.20	29.24	-	-	43.55	-
Dormaa Ahenkro	Tema port	421	Cocoa	33.76	22.65	-	-	43.58	-
Jumapo	Tema port	128	Cocoa	24.84	36.32	-	-	38.35	-
Dormaa Ahenkro	Tema port	421	Coffee	7.89	12.0	6.7	-	76.52	3.6

Source: Derived from Annex II.9.

This may be due to more price control in the latter, and possibly better integration. The general conclusion that can be drawn from the above observations is that marketing inefficiencies are more prevalent in the domestic marketing of food commodities. To reduce such inefficiencies, one needs to know the share of actual marketing costs and the quality of the marketing functions corresponding to those costs.

Structure of Marketing Costs

- 2.64 In this section, crop losses after harvest are considered costs to the marketing process. Other costs include transport, storage, processing, market toll, and miscellaneous costs (overheads, duties, bank charges etc). The analysis is based on data from a 1988 study by the PEME/MOA and our own interviews of traders and truckers. The analysis conducted is based on the direction of trade and the characteristics (perishable, semi-perishable etc) of the commodity. It is generally observed that transport costs per kilogram per kilometer are very variable. (Table 2.m).
- 2.65 Highly Perishable Commodities. These include cassava and groundnuts. The actual costs for fresh cassava from both Mampong and Techiman show basically the same pattern (Table 2.m). The highest component was storage cost, followed by transport, post-harvest losses and miscellaneous costs, in that order. Groundnuts are less perishable than cassava when properly stored. The cost is similar for groundnuts coming from Tamale and Mampong to Accra.
- 2.66 Semi-Perishable Commodities Rice and Maize are commodities grouped under this heading. It was earlier observed that these two commodities have high marketing costs as a percentage of marketing margin. Transport costs, storage and post-harvest losses are the dominant contributors to marketing costs. Marketing costs for grains can be reduced by as much as 20 percent if losses could be eliminated through proper post-handling functions.
- 2.67 Processed Commodities The two processed commodities considered in the study are gari and palm oil. Processing cost is about 32% of the total marketing costs in both cases, but post-harvest losses

account for almost 40 percent of the marketing costs in the case of palm oil, and only 11 percent in the case of gari.

- 2.68 Imported Food Commodities Of the three food commodities imported for consumption, only wheat is processed further within Ghana, into wheat flour. Processing cost contributes 40 percent of the total marketing cost (Table 2.m). This is followed by miscellaneous costs (mostly overheads), transport and storage. For imported commodities that are not processed further in Ghana, such as sugar and rice, overheads constituted over 66 percent of the marketing cost. Post-harvest losses constitute just over 10% of the marketing costs; this may be due to theft and poor handling. Transport and storage costs are low (under 10%). This is probably because most of these commodities are sold in the urban centres by government parastatals who have better storage facilities, and where the roads are quite good.
- 2.69 Export Crops Cocoa exhibits approximately the same marketing cost structure irrespective of the point of production (Table 2.m). This is possibly due to the legal monopoly enjoyed by the COCOBOD in this trade. Generally, post-harvest losses are relatively high, about 40 percent of the total marketing costs. Data available on coffee, which undergoes some processing, show that over 76% of the marketing cost is due to losses.
- 2.70 In the foregoing analysis, it is observed that commodities with high actual marketing costs (over 80% of marketing margin) include maize, local rice and palm oil. These are mostly domestically produced and consumed commodities. On the other hand, the lowest marketing costs (under 10%) are associated with the export crops of cocoa and coffee. This clearly indicates the efficiency differences between the internal and export marketing systems.
- 2.71 For domestically-produced and processed commodities, post-harvest losses are high, implying low recovery rate, among others. Miscellaneous costs for imported commodities are high, largely due to the high overhead and inefficiencies of the SOEs that handle those commodities.

2.72 Transport costs on a weight per distance basis showed wide variations, between 0.01 and 0.03 cedis. Such relatively high and variable transport costs are due to a combination of the following factors:

- a) the bad condition of the roads.
- b) the volume of traffic on the roads relative to the demand.
- c) the bulky nature of the commodity;

2.73 Quality of Marketing Services The marketing services provided between the producer and consumer in Ghana are limited in most cases. Some rudimentary sorting and grading are performed, but these are not standardized. Processing and packaging are the two least-developed services in the agricultural marketing system. However, marketing margins for processed staple foods range between 62% and 72% of the retail price. These percentages are comparable to those in developed economies like the USA. But the important difference is that in Ghana, the marketing system does not provide the same quality of transformation, processing, packaging and distribution functions on the agricultural produce. In other words, input costs of the Ghanaian agricultural marketing system are high in relative terms, but output values are low. Therefore, the marketing system's throughput efficiency is quite low, relative to more efficient marketing systems. That, in essence, is what marketing efficiency is all about: not just the size of the marketing margins or the farmers' share of the consumer's cedi, per se, but what the consumers get from those costs in terms of quality and value.

CHAPTER III

CONSTRAINTS AND PROBLEMS IN THE AGRICULTURAL MARKETING SYSTEM

Agricultural Marketing Constraints in the Context of Agribusiness Development

- 3.1 In this Report, the constraints in agricultural marketing refer to the various factors that impede the smooth flow of farm commodities from the farmers to the final consumers. The constraints harm the marketing system by causing bottlenecks and imbalances, either individually or in combination with other constraints.
- 3.2 Any agricultural product passes through a vertical commodity system consisting of operators, supporting elements, and co-ordinating mechanisms. A diagram of a typical agribusiness commodity system is presented in the next page as Figure 3.i.
- 3.3 Operating Participants

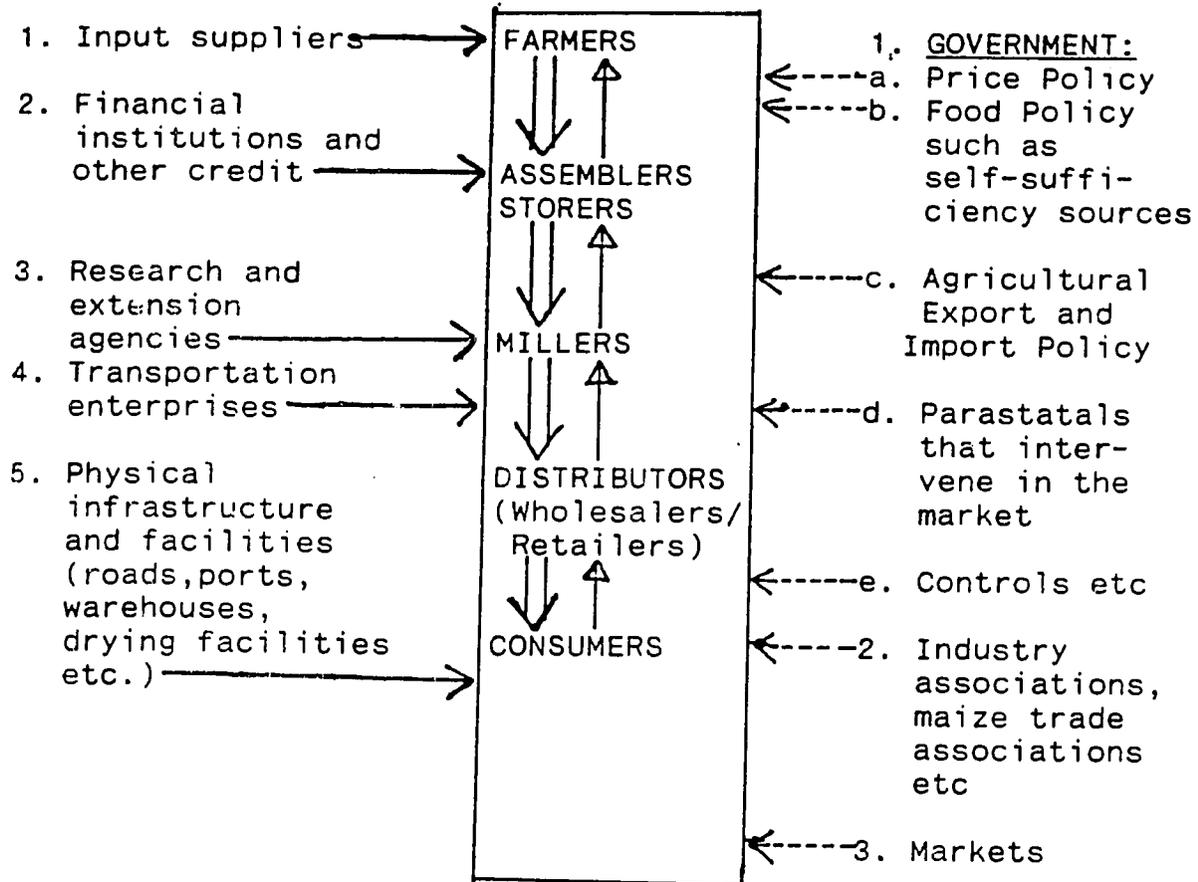
The operators in the vertical commodity system are the farmers, marketing agents, and processors who transform the inputs from upstream to an edible output (maize) downstream until it reaches the consumer's table. The farmers combine land, seeds, water, sunlight, fertilizers, pesticides, family labour and his own labour and management skills to produce ripe maize grains. After harvest, the various marketing agents add utility or values to the grains by moving them (place utility), storing them (time utility), and milling them (form utility). The operators, therefore, are interdependent participants that take risks in the production and flow of the commodity down the vertical system.

3.i. A Typical Agribusiness Commodity System (e.g. Maize) in a Developing Country

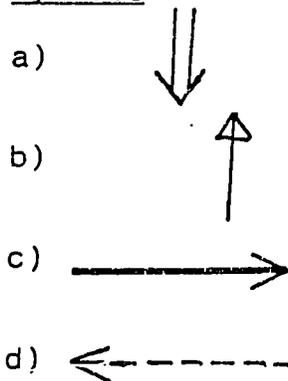
SUPPORTING ELEMENTS

OPERATING PARTICIPANTS

COORDINATING MECHANISMS



Symbols



Meanings

a) Downstream flow of commodities among the system participants.

b) Upstream flow of payments and credit among system participants

c) Flow of inputs and supporting services into the system.

d) Flow of policies, price signals and other coordinating activities into the system.

Supporting Elements

3.4

The supporting elements consist of various institutions and services that facilitate the production and flow of the particular commodity.

- a) The input suppliers provide the fertilizers and chemicals that the farmers use to "feed" his maize plants and combat pests.
- b) The banks and other credit sources provide financing to facilitate transactions between the operating participants (commodity flow is always accompanied by payment/credit in every transaction.)
- c) The transportation firms physically transfer the commodity from production areas to consumption centers, and from surplus to shortage areas;
- d) Research and extension agencies, including universities, continuously generate the technologies to improve the capability of the system to produce and satisfy the quality and quantity requirements of the final consumers.
- e) Finally, the physical infrastructures provide the means by which the operating participants move and add utility to the agricultural commodity.

Coordinating Mechanisms

3.5

In a developing country, food commodity systems are so politically and economically important that governments generally intervene in the system through various policies, regulations, controls, and state-owned enterprises that directly intervene in the market. On the other hand, in advanced countries that are not centrally-planned, spot and futures markets as well as trade/industry associations perform most of the coordinating functions.

3.6

While it is easy to understand the roles of the operating participants and the supporting elements, the functions of coordinating mechanisms are not as straightforward. Essentially, the coordinating mechanisms are the stabilizers of the vertical system. For example, the Government, through a favourable support price, motivates the farmers to

plant a crop. At the same time, through a ceiling price, it protects the final consumers from going hungry, especially the low-income ones. By having those lower and upper price limits in a strategic commodity (eg. staple) many governments stabilize the system. However, if the price policy is not realistic or does not reflect true opportunity costs, the policy also stunts the system, i.e. short-run stability but long-term imbalances.

- 3.7 The maize traders' association helps coordinate and stabilize the system by articulating aspirations and interests of the operating participants in bargaining or negotiating with the government, financial institutions, etc.
- 3.8 Finally, the markets perform the most important coordinating function of all: that of communicating price signals up and down the system. The price signals affect the allocation decisions of the farmers, processors and traders, and therefore the eventual supply situation. On the other hand, the price also affects the consumers' consumption decisions, and thus, the demand situation. In the final analysis, therefore, the price that the markets provide, whether free or regulated or distorted, determine the supply-demand equilibrium or imbalances in an agribusiness commodity system.

Constraints in the System

- 3.9 In a very interdependent structure like the previously diagrammed commodity system, a bottleneck can occur at any stage of the system, impeding the smooth flow of the commodity. When that happens, the whole system is affected. For example, a shortage of trucks can prevent the maize assemblers from moving the harvested grains to the warehouses and mills. The bottleneck will soon be communicated downward in terms of shortage, and a corresponding higher price signal would be communicated upward sooner or later.
- 3.10 Our experiences in diagnosing agribusiness systems in developing countries in Asia and Latin America invariably show that the system constraints generally fall under two categories, namely:
- a) Inadequacies in the supporting elements (credit, infrastructures, extension, inputs, etc.);

b) Shortcomings in the coordinating mechanisms, inappropriate government policies and other market distortions that create disincentives in the system.

3.11 In this Report, the Ghanaian agricultural marketing system is analyzed using the above agribusiness systems perspective to shed light on the critical constraints in the system and to search for feasible solutions.

Infrastructure Constraints

3.12 The most important single constraint to the agricultural marketing system is the inadequacy and poor conditions of feeder roads, bridges, ports, vehicles, and market centers. One way of quantitatively showing the constraining effects of lack of marketing infrastructures is by comparing the domestic resource costs (DRCs) for market levels. For 1988, it was estimated that the maize DRCs were as follows:

Farming technology	Farmgate level	Rural market	Urban Wholesale
a) Traditional Farming	0.68	0.76	1.72
b) Improved, with draft animals	0.40	0.53	1.39
c) Improved, with machineries	0.38	0.46	1.51

Since a DRC of less than one indicates comparative advantage, and comparative disadvantage if greater than one, the above data indicate how comparative advantage in the farms changes into comparative disadvantage in the urban areas, which implies the substantial costs needed just to bring the same grain of maize to the urban markets.

Feeder Roads

3.13 Ghana has a feeder road network of 24,000 kilometers (km), including 10,000km in cocoa areas. Over 60% of the feeder roads are in poor conditions, generally accessible only in the dry

season, as the government could only maintain about 18% of the feeder roads annually. The rapid deterioration of the feeder roads, caused by rains and heavy trucks, has forced the government to shift more of its feeder roads funds from development of new ones to maintenance of existing ones.

Transport Vehicles

- 3.14 The main problem with the transport vehicles in terms of agricultural marketing is that they are both inadequate in number and are generally inappropriate for hauling perishable and easily-damaged fruits and vegetables. Many trucks are without cover, padding, and appropriate containers for delicate agricultural crops. Such vehicles, travelling on badly-maintained feeder roads, result in high losses in weight and quality in transit. It should not be surprising, therefore, to discover that in Ghana, transportation costs contribute as much as 30-50% of the total marketing costs. Table 3.b shows transportation costs in selected routes; most of the highest charges per kilometre were found in routes with very poor roads.

Market Structures

- 3.15 The market structures constrain the agricultural marketing system in two ways, namely:
- a) Generally inadequate number and low density of village, district and urban markets relative to population and area; the lack of nearby markets force the farmers to either store the crops in his house or sell them to the traders who come during the harvest season;
 - b) Poor condition and lack of market facilities (water, toilet, etc) in the existing markets, including urban ones;
 - c) Poor lay-out, unsystematic operations, and inefficient management of the markets.

Post-Harvesting Handling Constraints

- 3.16 Storage, drying, and preservation facilities/methods

There are ample evidences in the studies and experiences of FRI and the MOA that post-harvest

Table 3.a. Comparative Transport Rates for Selected Commodities, 1989

Commodity	From	To	Distance	Charge/ Bag	Charge/ Bag/Km
			KM	Cedi	Cedi
Maize	Techiman	Accra	390	733	1.88
	"	Takoradi	494	300	0.64
	Wenchi	Techiman	29	733	25.30
	Bechem	Mansin	5	275	55.00
	Abutia	Denu	144	1,000	6.94
Groundnuts	Saabum	Atebubu	60	600	10.00
	Ankuruma	Kintampo	5	300	60.00
	Kintampo	Kumasi	176	600	3.04
Cowpeas	Techiman	Takoradi	494	800	1.62
	Adanso	Atebubu	56	400	7.14
Garri	Akatsi	Accra	142	200	1.41
	Mafi- Kumasi	Dabala	80	350	4.40
	Akatsi	Dabala	24	200	8.30

SOURCE: Data compiled from PPME Market Reports.

Notes on Weights per bag

- a) Maize : 100 kg
- b) Groundnuts : 82 kg
- c) Cowpeas : 109 kg
- d) Garri : 68 kg

losses in quantity and quality of the crops are substantial. One study calculated that losses in cereals range from 8% after one month to 20% after four months of storage by traditional methods. Higher losses are incurred at the farm level because of lack of on-farm storage and drying facilities. Farmers merely use traditional cribs and bins for storing their reserves for home consumption and seeds. There is very little storage facility in the marketplace. Altogether, the lack of storage facilities at the farm level and rural markets, when combined with poor roads and lack of transport facilities, tends to magnify the price difference between the farms and markets (spatial variation) as well as between the harvest and lean seasons (temporal variation).

- 3.17 Another problem with storage is the fact that some government corporations possess storage capacities that are unused at certain times but which are not readily accessible to farmers and traders who need storage space. The reasons for such a mis-match between storage needs and availability include distance, costs, and the farmers not knowing about space available (they are not advertised), as well as the warehouse/silo management not knowing about the demand for storage space.

Agroprocessing

- 3.18 Processing performs important functions in agribusiness development:
- a) it extends the shelf-life and availability of perishable products (supply smoothing over time);
 - b) it enhances the value of the raw production; and
 - c) it satisfies the changing consumer preferences toward better-prepared and packaged foods.

The two critical constraints in rural agro-processing are:

- a) The ineffective dissemination of appropriate techniques from R & D or pilot stage to commercialization, and
- b) Lack of reliable electricity and water supply in the rural areas.

Pricing and Related Constraints

3.19

The pricing constraint in food crops consists basically of price formation and support price implementation, manifested in the following forms:

- a) Price instabilities and uncertainties due to weak farm-market linkages, cycles of good and bad harvests, and lack of market integration.
- b) The Guaranteed Minimum Price (GMP) policy for maize and rice suffers from the following defects that dilute its effectiveness:
 - . The GMP is set and periodically adjusted based on three factors, namely, production costs, financing costs (at 70% borrowing level), and 5% each for management and contingency costs. The GMP's determination does not consider international (border) prices at all. Indeed, the GMP has historically tended to exceed international prices, especially for rice. Such a policy is biased against economic efficiency and cost-competitiveness.
 - . At harvesting time and during a bountiful season, market prices decreased to below the GMP level in some areas, particularly those that are far from markets;
 - . GFDC cannot always implement or support the GMP because of shortage in operating capital and storage facilities. On the average, GFDC could only handle about 5% of the volume of marketed production, which is too low to achieve its price stabilization and income enhancement goals.
 - . The GMP is set and implemented as a fixed point, regardless of quality level such as moisture content; this does not encourage good drying and post-harvest practices.

Financial Constraints

3.20

This problem, especially as it concerns small farmers, is a much-researched topic in universities and development institutions. However, there is a dearth of studies on the nature and magnitude of the financing needs of the marketing system (traders, processors, distributors). One wonders

why virtually no studies have been done on credit needs of agricultural marketing intermediaries. This seeming bias in analytical orientation and development assistance is probably due to an egalitarian concern for the poor small farmers, and a general perception that traders do not deserve financial assistance because they tend to exploit farmers. Nevertheless, despite the widespread concern for financing small farmers, we note a generally myopic concern of farm credit schemes that fail to consider the financing needs of farmers in marketing his produce. Thus, loans become due right after harvest, forcing the farmers to sell at the same time, with price-depressing effects. In conclusion, the financing problems in agricultural marketing generally take the following forms:

- a) Inadequate financial capital for farmers to enable them to store their harvests and wait for better prices;
- b) Inadequate working capital among traders and processors;
- c) Weak institutional credit delivery system, as manifested in insufficient rural branches, lack of technically-trained staff for credit appraisal and supervision, and insufficient loanable funds.
- d) A financial problem of a different nature, but equally constraining to the system, is the lack of sufficient fiscal resources to construct marketing infrastructure and increase credit flows to agriculture, especially since the Structural Adjustment Programme (SAP) requires fiscal prudence. In fact, the share of agriculture, fishery and forestry from the total institutional credit in Ghana fell from 32% in 1983 to 16% in 1988.

Lack of Facilitating Marketing Services

3.21

The key services needed by the agricultural marketing system, but which are currently lacking, are the following:

- a) Research, development, and effective dissemination of better drying, food preservation, packaging, and small-scale agro-processing methods.
- b) Usable and timely information on prices, stock, and flow of food crops (daily and by key market areas).

The present marketing information service at the MOA is limited to price, too infrequent (weekly, at best), and not even widely disseminated. The price monitoring process is basically oriented to diagnosing statistical trends overtime for the use of policy makers. On the other hand, what the system needs more is daily information on "spot" market situations for the farmers, traders, and consumers.

Institutional Problems

3.22 This problem area is generally complex because it involves entrenched bureaucracies, antiquated procedures, low morale, poor management and general inefficiencies. Many studies by the World Bank and FAO, among others, have documented such institutional problems. Nevertheless, it is possible to summarize those institutional problems that affect Ghana's agricultural marketing system in the following manner:

- a) Poor credit delivery system;
- b) Weak institutional capacity to package and effectively disseminate to the marketing system the existing results and pilots of research, such as those from DAPIT, FRI, and even from abroad (For example, Canada's IDRC has a Center for Appropriate Technology in Singapore).
- c) Poorly-managed and fiscally-draining SOEs; while the government has a divestiture and privatisation programme, its implementation is hampered by politics and lack of private-sector interest and capacity to buy and run those SOEs;
- d) Weak internal organizational and management systems, and poor coordination among the relevant government agencies that impinge on the agricultural marketing system, including the following:

- . MOA
- . MIST
- . MLGCD
- . GFDC
- . GWC
- . GEPC

- e) Too much centralization in Accra offices of the policy formulation process with insufficient grassroots inputs and participation; once formulated, many policies cannot achieve their developmental and social equity objectives because the institutional infrastructure (operating procedures, trained staff, monitoring and feedback system, and budget) is inadequate.

Constraints to Expanding External Trade

3.23

Ghana's overdependence on traditional exports like cocoa makes its foreign exchange earnings and development expenditure highly vulnerable to the international cocoa market changes. In recognition of this vulnerability, the government has created a programme to increase its non-traditional exports, under the coordination of the Ghana Export Promotion Council (GEPC). Judging by its performance, the effort of Ghana to expand its exports seems to be constrained by the following:

- a) Inadequate information and contacts from new markets, such as Japan and the USA.
- b) Generally similar resource endowments and agricultural potentials with its ECOWAS partners, which means trade largely by comparative advantage and competitive edge, about which very little systematic research has been done;
- c) While the ERP has helped increase the capacity of the agricultural sector to feed the population with cereals and tubers/root crops, fruits, vegetables and other horticultural products have not increased as much.
- d) The traditional exports sector has been primarily run by state-owned enterprises (SOEs) and multinational corporations. This has limited the spread and development of an indigenous exporting mentality, which is a

kind of culture that consists of an overriding concern for quality, cost-consciousness, competitive attitude, and aggressive promotion in markets abroad.

- e) Lack of export "hardware" such as cold storage at the airport for perishable fresh products, and "software", such as simplified export procedures, tax incentives, and foreign exchange retention policies.

CHAPTER IV

RECOMMENDATIONS AND OPPORTUNITIES

4.1 Part 1 of this chapter will deal with the recommendations for improving upon the Agricultural Marketing System and Part II with opportunities that would arise as a result of an improved marketing system. Recommendations for the improvement of the Agricultural Marketing System would be categorized under the following major headings:

- a) Marketing infrastructure
- b) Post-harvest handling
- c) Financial/credit delivery system
- d) Developmental Policies
- e) Facilitating Services, including the institutional strengthening of key agencies

Marketing Infrastructure

4.2 Roads. In most parts of Ghana, 85% of marketed production is carried by headloads from farmgate to point of sale. The poor state of our roads (bearing in mind the high cost of road construction of about C8m per km of feeder road) has been identified as one of the major causes of the high costs of moving farm produce from the producer to the consumer. The implication is that an improvement in the road network of the country would improve accessibility and facilitate marketing of produce from producing areas to the urban centres and, thereby, substantially improve availability and price.

4.3 Action Recommendations

- a) Communal labour and labour-intensive methods in road construction should continue to be utilized.
- b) Realistic yearly programmes of repair and maintenance of crucial feeder roads under the PIP need to be drawn and strictly implemented.
- c) Experimentation in the use of substitute locally-available materials like limestone should be carried out.

4.4 Transport Vehicles. The transport component currently ranges between 30-50% of the marketing costs for prices of food crops. This is a

result of unavailability of vehicles owing to the initial high cost of purchasing transport vehicles and the accompanying high cost of spares and maintenance. Vehicle owners are generally choosy as to where their vehicles should ply. Since most of the food-producing areas invariably have bad access roads, vehicle owners and drivers alike have preferred not to operate within those areas. The resultant factor is the acute lack of transportation and their high costs.

4.5 Action Recommendations

- a) Encourage and expand the use of alternative means of transportation like the waterways, rail transportation, horse carts, donkey carts where appropriate, thereby increasing market access and lowering marketing costs;
- b) Initiate special schemes for cooperative transport ownership, hire-purchase agreements and plant pools.
- c) Introduce specially-constructed vehicles for agricultural produce (with padding and suitable containers, for example).
- d) Continue policy of duty-free importation of commercial vehicles.

4.6 Sea Ports. The Ghanaian ports were specifically constructed to serve the traditional exports of cocoa and minerals (which are outside this study) and the importation of imported food (mainly wheat and rice). There was no provision for other agricultural produce that require freezing or regulated temperatures like our new agricultural exports such as fruits. The sea ports, though equipped with railroad terminals, are hardly used for the non-traditional agricultural exports. Also, the ports are limited in number (1 in Takoradi, the other at Tema), and have remained basically the same in size, but now handling greater volumes. Two years ago, some expansion programmes have been initiated.

4.7 Airports. There is only one international airport in Ghana that can be used for the export of non-traditional exports like fresh agricultural products. However, lack of adequate and appropriate storage facilities cause produce quality to deteriorate prior to loading.

4.8 Action Recommendations

- a) Construct more inland ports in addition to Akosombo and Buipe to enhance the improved waterways system.
- b) Install suitable storage at the airport including freezing facilities for the export of fresh fruits and vegetables and other horticultural products.

4.9 Market Centres. The low density of markets constrains distribution in the sense that producers, traders and consumers have to travel relatively long distances to trade with each other. Aside from being few in number, many of these markets are in poor condition, temporary in nature, ill-equipped, and badly managed, except for some urban markets.

4.10 Action Recommendations

- a) Construct efficient, cost-effective market structures (urban, district, rural). Their locations should be based on production potentials, and synchronized with the feeder roads network.
- b) Provide training and technical assistance to market managers and management bodies such as district councils so that they can be motivated to render services to the traders, instead of just collecting fees.

Post-Harvest Handling

4.11 Storage. The lack of adequate storage, the non-practicability of some structures, poor management, climate, location and poor methods of storage all contribute to heavy post-harvest losses which have been reported to reach as high as 30% after 6 months for most cereals. If we can only reduce that loss by even just half, it would be equivalent to expanding hectareage by 15%! In 1985, the amount of loss of maize alone at farm level storage was estimated at 50,000 metric tons.

4.12

Action Recommendations

a) Increase on-farm storage capacities and improve structures.

Farmers should be exposed to the methods of constructing improved cribs. Private marketing enterprises and District Councils should be encouraged to invest in storage structures at vantage places and rent them out for a fee. In addition, farmers should be encouraged to form groups or cooperatives to be able to construct economic-size storage structures. Private investors should be encouraged as well.

b) Effectively package and disseminate new, improved food preservation and processing techniques from the research agencies to the farmers and marketing participants.

Research findings on improved preservation methods and the use of pesticides, etc. should be efficiently disseminated to farmers. There should also be an improved physical handling of produce from farms to markets and down to consumers through demonstrations to minimize damage to produce.

c) Rationalize Existing and Planned Storage Capacities of Public Institutions and their Utilization

The GFDC owns 25,950 mt of storage capacity, consisting of 16,350 mt capacity of warehousing space and 9600 mt of silos. In addition, the GFDC rents warehouse space totalling a capacity of 18,530 mt. The highest quantity of cereals purchased by GFDC was 22,860 mt in 1988. This just about filled the 22,950 mt of GFDC's storage capacity in working order, and in the case of GWC, (with 10,000 mt) it has never been able to utilize its capacity to the fullest since its inception. Such underutilization amidst overall shortage of storage space is economically wasteful.

4.13

Action Recommendations

- a) GFDC and GWC should maintain their storage facilities in perfect working condition.
- b) Improve management and training of staff at GFDC and GWC.

- c) Whenever idle storage capacity arises, it should be announced and rented out for a fee.
- d) On-farm storage should be appropriate to the humid climate and the resource constraints of farmers and rural traders.

4.14 Agro-processing. Agro-processing enhances the usefulness of farm products in many respects. Preservation methods help in extending shelf life for both distributors and consumers. Packaging assists storage as it protects the contents from damage and deterioration. Agro-processing mainly consists of rice milling, cassava to garri, palm fruit to palm oil, palm nut to palm kernel oil, etc. Overall, the linkage between agriculture and industry is quite weak because of low level of agro-processing activity in general, crude technologies in village-level processing, and obsolescence in the SOE factories.

4.15 Action Recommendations

- a) Package and effectively disseminate improved processing techniques and equipment from DAPIT, FRI, and ITTUs to the users.
- b) Agro-based industries should be located near the source of raw materials in order to save on transport costs and shrinkage, increase rural employment, and generally improve life in the rural areas.
- c) Accelerate the rehabilitation of obsolete machineries of key SOEs, e.g. the Tema Food Complex.

Financial/Credit Delivery System

4.16 The farmer requires credit for storage after harvest. Market intermediaries need credit to purchase the produce, and pay for transportation and warehousing costs. The government agencies need credit for operating capital. Food processors need credit to stock raw materials. Such credit demand, however, cannot be fully satisfied by the inadequacies of loanable funds and the institutional credit delivery system.

4.17 Action Recommendations

a) Strengthen the rural banking and cooperative banking system.

A system should be introduced by the government whereby rural banks would receive capital from the central bank, insurance companies, and social security trusts at relatively low interest rates. With adequate capitalization, the rural banks should be required to improve their management and expand their services to the agricultural marketing system, such as the financing of warehouses, transportation enterprises, agro-processing, and the operating capital needs of traders and farmers after harvest.

b) Introduce Integrated Agricultural Financing in the Credit System

While at the initial stages the rural banks could deal with short term and relatively smaller credits, the well established commercial, investment and development banks could look at integrated agricultural financing and support complete projects where activities from the production to the marketing stage are financed as a system. The more common projects of this nature are palm oil and pineapple plantations with processing plants. They generally require huge long-term investments.

Integrated agricultural financing can also be used to alleviate the constraints on working capital among small crop farmers. The concept of an integrated financing is akin to a revolving credit line concept. The objective is to encourage a farmer to diversify his farming system horizontally to other cash crops, and vertically to post-harvest activities that add value to his harvests. These diversifications of his farming system or his mini-enterprise is constrained by the traditional production credit that becomes due and collectible at or soon after harvest. Such integrated agricultural financing will allow the farmer to finance the storage of his harvests, and the costs of waiting for a better price. He will then strengthen his bargaining position vis-a-vis the assemblers and traders who exploit their financial leverage at harvest time. The World Bank has implemented such integrated agricultural and

agroindustrial financing scheme in Brazil, amounting to about \$300 million. It is currently in the process of formulating a similar package of \$200 million for Indonesia. Under both packages, interest rates are at market levels, without subsidies.

Developmental Policies

4.18 Once a government's path of development is determined i.e. whether Agricultural, Agroindustrial or Industrial in orientation, ultimate success or failure would depend to a large extent on the policies of the government and participation of the private sector. Currently, the agricultural marketing policies in the country are either unclear or unenforced. Whatever policies on marketing exist are ad-hoc and are not implemented due to lack of concrete plans and programmes to translate policies into action.

4.19 Action Recommendation on Macro-policies

The government should adopt a system's perspective in policy formulation. Almost every macro-economic policy (eg. trade, foreign exchange, fiscal, and monetary policies) affects the food and agricultural sector, which consists of both production and marketing systems. Therefore, the dynamics of the production-marketing linkage in agriculture should always be considered and anticipated, aside from the broader agriculture-industry linkages in the economy.

4.20 Pricing Policies. Agriculture in Ghana is predominantly smallholder-based, as indicated earlier in this Report. As such, pricing policies serve as a very crucial mechanism for stabilizing and enhancing farm incomes. With the traditional exports, regular price reforms have been administered successfully over the years, eg. in cocoa, coffee, and tobacco. On the other hand, a guaranteed minimum price (GMP) is applied to maize and paddy rice. The problem is that the GMP is not sensitive to fine quality differentials. Another problem is that the GFDC, which implements the GMP, sometimes cannot enforce the policy for lack of money and storage space.

4.21 Action recommendations

- a) The GFDC should be given the necessary support by the government in terms of adequate storage capacity and working capital.
- b) Pricing policies should encourage grading and post-harvest functions; therefore the GMP should vary by quality (moisture content, size, etc.)
- c) Pricing policies should be regularly reviewed and any revision should be announced before planting.

Facilitating Services and Institutional Strengthening

4.22 Market Information Systems. The PPME of the Ministry of Agriculture, with the help of international agencies like the USAID, UNDP, World Bank and F.A.O., has been trying to build up data and information on agricultural marketing. However, the analysis, packaging and dissemination of those data do not seem to benefit the farmers and the traders, probably because of their limited coverage and untimeliness.

4.23 Action Recommendations and Marketing Information

- a) Better data-collection systems should be designed and used, such as comprehensive reporting sheets for extension officers, regional directors, and other information collectors. These must be properly filled out on a regular basis. Regular visits to farmers, market centres and intermediaries at different locations should be conducted to verify the accuracy of the data.
- b) Market information should not be limited to the national boundaries. Demand, supply, and prices should also be gathered at the regional and international levels.
- c) We recommend the setting up of an Agricultural Marketing Information Unit separate from the PPME unit at MOA, with trained personnel and up-to-date equipment. This unit should be charged with collection, processing and analysis of all kinds of marketing information. Such a unit should have two basic functions; firstly, inform the farmers and traders of the daily situation on prices, availability, and movement of key

commodities; and secondly, provide the policy makers with feedbacks and impact studies concerning the price policies.

4.24 Action Recommendations on Extension and Training

- a) Agricultural extension officers should not limit themselves to production techniques. They should be trained in agricultural marketing and post-harvest functions. They should enhance the incomes of farmers, not just their production. For that, they need to be trained in marketing.
- b) Steps should be taken to improve the caliber of participants within the marketing system at all levels of the hierarchy. With the assistance of the universities and the agricultural research institutions, the bulk of training could be done locally, especially in areas like handling and storage, market operation and management, packaging, price analysis, etc. However, the need for overseas training and exposure to various Agricultural Marketing Systems would have to be considered at the professional and middle management level. In this area, co-operation and assistance should be sought from the international agencies like USAID, F.A.O., and U.N.D.P.

4.25 Action Recommendations on Grading and Standardization

- a) Processing and packaging companies should offer a premium for good quality produce, based on measurable criteria such as weight, size, moisture content, etc.
- b) Consumer groups should be organized and educated on quality and value, so that they will exert pressures for quality control on the marketing system.
- c) Government should come out with directives relating to grade premiums and specific packaging standards.

4.26 Weights and measures Currently, different methods are used as measures for the sale of various cereals. Various baskets and wooden crates are used for the sale of fruits and vegetables. The net effect is that producers, intermediaries and

consumers try to cheat each other or feel cheated in many transactions. Meanwhile the gathering of comparable market information becomes tedious, if not impossible. The metrication committee was set up in August 1970, but not much progress has been made up to now.

4.27 Action Recommendations on Weights and Measures

- a) The Metrication Committee should revive active education through publications, mass media, etc.
- b) Marketing extension officers should educate farmers and cooperative groups on advantages of metrication.
- c) Government agencies involved in the marketing system should insist on purchasing by weights and measures.

4.28 Tax and Investment Incentives. Various tax concessions and investment incentives have been operational for many years. Examples include farming projects that are exempt from income tax for the first five years, and a special low tax rate for factories located in the rural areas. Whether these concessions have achieved their desired results is highly debatable. A successful commercial farming venture requires substantial capital which is not always available to the majority of Ghanaian farmers or market intermediaries. The few who have had access to capital and have ventured into farming have not had their expected rate of return owing to poor project analysis and financial projections, not to mention the absolute lack of insurance schemes and the near total dependence on the weather. One result is that small-scale farmers continue to dominate the agricultural sector. Also, the low level of economic activity, coupled with the lack of basic utilities like water and electricity in the producing areas, is hardly attractive to the risk-averse investors. The only notable exceptions are SOEs like GIHOC and a multinational company (U.A.C.).

4.29 Action Recommendations on Investment Promotion

- a) Improve the promotion of new farming and agro-processing enterprises by developing and disseminating project profiles of viable projects, promoting and supporting contractual

arrangements between agro-processing plants and farmer groups, such as the Nucleus Estates and Smallholders (NES) projects financed by the World Bank in Indonesia.

Opportunities and New Initiatives

4.30 Expanding Trade with Neighbouring Countries (ECOWAS)
In spite of the honourable objectives of the Ecowas and other trade pacts, official intra-regional trade with neighbouring countries have not flourished as expected. Evidences suggest that a sizeable portion of the relatively small trade Ghana has with the ECOWAS region has been unofficial (smuggling), especially in the past when the cedi was overvalued. Intra-regional trade can be encouraged if detailed studies are conducted into the comparative advantages and potentials for specialization and complementation among the ECOWAS members. An approach like this would help optimize the use of scarce resources in the region. It would facilitate regional consensus and collective political will if such a rigorous study can be implemented.

4.31 Trends in Non-Traditional Agricultural Exports, 1986-1988: Ghana's overdependence on cocoa (60% of export earnings; \$475 million in 1987) as foreign exchange earner makes its economy quite vulnerable to international price movements, such as the glut in the market that has depressed cocoa prices in recent years. The government, therefore, has started a programme to promote non-traditional exports, both agricultural and non-agricultural, implemented by the Ghana Exports Promotion Council. The programme involves non-traditional products and non-traditional markets. Our analysis of the performance of the programme during 1986-1988 using data from GEPC and other sources shows that Ghana's non-traditional agricultural exports are still disappointingly low, averaging at about 3.3% of total agricultural exports in 1986 and 1987. However, as a percentage of total non-traditional exports, non-traditional agricultural products comprised 75% and 67% in 1986 and 1987, respectively.

The non-traditional agricultural exports that exceeded US\$1,000 in value in 1988 were the following (more detailed information is in Annex IV-I):

- a) Fresh pineapples, \$1,408,000, almost all of which went to Western Europe;

- b) Fresh mangoes, \$6,630; all to U.K.;
- c) Fresh banana, \$2,690, all to West Germany;
- d) Fresh oranges, \$1,100' almost all to U.K.;
- e) Fresh coconut, \$4,110, all to West Germany;
- f) Assorted fruits and nuts, \$4,020, almost all to EEC countries;
- g) Garden eggs, \$2,260, all to U.K.;
- h) Fresh tomatoes, \$2,000, all to Togo;
- i) Plantain, \$6,840, almost all to U.K.;
- j) Yam, \$183,300, almost all to U.K.;
- k) Tuna fish, \$14,298,200, 40% of which went to the U.S.A.;
- l) Medicinal plants, \$84,500, almost all to U.K.;
- m) Kola nuts, \$1,031,900, almost all to ECOWAS countries;

4.32

From the preceding information on destinations of non-traditional exports, the following assessments can be easily derived:

- a) The destination of Ghana's non-traditional agricultural exports is oriented mainly toward the European Economic Community (EEC), particularly the United Kingdom (UK). This situation is due largely to the traditional trade relations and trade preferences that exist between Ghana and UK/other EEC countries. Such relations and preferences are now being threatened and will likely be undermined when the 12-nation EEC enters a new phase of economic integration in 1992. The prognosis is that starting that year, the agricultural exports of the poorer members with warmer climates (Spain, Portugal, Greece) will be preferred and protected by the whole community.
- b) Ghana's trade with its ECOWAS partners is quite negligible. The only exports of note were kola nuts, fresh pineapples, fresh tomatoes, tuna and yam. The breadth of the commodities and their

volumes are considered by both the GEPC and the private sector as too low, relative to Ghana's productive potentials, and relative to the opportunities for regional trade.

- c) The third conclusion about Ghana's performance is that the pattern of volumes and values over the last 3 years has been more erratic than stable, except for pineapples, yam, tuna fish, and medicinal plants. For the majority of the products, the erratic pattern manifested itself in wide fluctuations in volumes and values, even going down to zero in some years for some commodities.

4.33 There have not been studies in Ghana on the reasons for such a pattern, but we can offer the following as plausible reasons, based on our experiences in similarly-situated countries:

- a) Erratic harvests of Ghana's producers, both in quality and quantity;
- b) Erratic supply (gluts and shortages) and changing competitive situations in the importing EEC and ECOWAS countries;
- c) Generally passive nature of Ghana's exporters, i.e., waiting for foreign orders, rather than aggressively searching for contacts and buyers abroad;
- d) Finally, the GEPC's non-traditional export program is still relatively young. It is still passing through the early phases of its "learning curve".

4.34 Action Recommendations

- a) Conduct a systematic analysis of Ghana's comparative advantage and its competitive edge in non-traditional agricultural exports, vis-a-vis ECOWAS and other new markets (e.g. Japan and USA).
- b) Accelerate and strengthen the promotion of non-traditional exports, by focusing on the following:
 - . Strengthen the institutional capability and flexibility of the GEPC to respond quickly to

rapid changes in the international markets;
explore the feasibility of making GEPC a "one-stop service and documentation center" for non-traditional exports:

- . Formulate appropriate incentives and simplified procedures for exporters:
- . Aggressively establish contacts with Japan, USA, and the newly-industrialized countries (NIC) of East Asia;
- . Improve quality control;
- . Assist the private sector in putting up a cold storage facility at the airport for perishable fruits, vegetables, and other horticultural products;
- . Organise exporters, and train them, and instill an "exporter's mentality" (e.g. quality consciousness and cost-competitiveness).

CHAPTER V

SOME OPPORTUNITY WINDOWS FOR MEANINGFUL IMPACT FROM USAID ASSISTANCE

Criteria for Identifying Opportunities

- 5.1 USAID's basic goal in Ghana is to contribute to increasing per capita income growth through private business sector development and employment. Its main thrust in the 1988-1991 period is to support the government's Economic Recovery Program through fast-disbursing program assistance (eg. foreign exchange auction), alleviating the social costs of adjustments, management of population pressures, food aid, and training activities (in-country, third-country, and in the USA).
- 5.2 In identifying strategic and impactful areas of assistance, we have considered the following general guidelines that govern USAID's strategic options, which require that USAID intervention should:
- a) Improve the institutional enabling environment;
 - b) Be able to obtain Government approval and support;
 - c) Complement other donors without duplication;
 - d) Promote microenterprise development;
 - e) Enjoy private sector support;
 - f) Generate productive employment;
 - g) Mobilize private savings and investments;
 - h) Promote value-added production;
 - i) Generate foreign exchange;
 - j) Be consistent with USAID human and financial resource strengths and limitations.
- 5.3 In addition to the above general guidelines, the team also considered the following criteria that are specific to agricultural marketing systems, as follows:
- a) The assistance should remove or loosen one or more critical bottlenecks in the marketing system;
 - b) It should focus on those bottlenecks and gaps in which there is a relative dearth or inadequacy of foreign assistance;
 - c) It should yield visible and measurable impact over a relatively short time;

- d) In the process of removing or loosening a marketing constraint, the assistance should also build up managerial capabilities and technical skills of the marketing system participants, aside from introducing innovative and efficiency-enhancing structures, systems and procedures; and
- e) Finally, the assistance should try to benefit the poorer segments of the rural societies of Ghana, or at least minimize socio-economic inequities.

Key Recommendations for USAID Assistance in the Medium Term

5.4 In accordance with the above guidelines and criteria, we would like to recommend the following as deserving of USAID assistance in agricultural marketing and agribusiness development:

- a) Continue and if possible increase assistance for rural infrastructures, especially feeder roads development and rehabilitation;
- b) Promotion and development of small and medium-scale agribusiness enterprises, with priority on post-harvest handling, drying, storage, grading and agro-processing - all of which add substantial values to raw farm produce.
- c) Integrated agricultural financing, with emphasis on operating capital for marketing activities.
- d) Systematic collection and dissemination of agricultural marketing information.
- e) Promotion of non-traditional agricultural exports.

5.5 All of the above areas of assistance can reinforce each other and result in cumulative system synergies which, in 2-3 years, would position USAID as a lead developer of Ghana's agricultural marketing and agribusiness.

Rural Infrastructures: Feeder roads and other conveyances

5.6 Ghana at independence and up to the early 1960s had a good network of roads and a railway system which hauled the bulk of cocoa and minerals to the ports for export. From the late 1960s until the launching

of the ERP in 1983, the rural infrastructure became completely run down due to lack of maintenance, foreign exchange constraints on the importation of the vital spare parts, and inadequate budgetary allocations. The poor condition of roads and the unreliability of transport led to higher transport costs in marketing agricultural produce.

- 5.7 The Government's plans and programmes to modernize the rural areas through the provision of good roads, health and educational facilities as well as good drinking water are outlined in the annual budget. In addition, bilateral and multilateral agencies are involved in the rural infrastructure development of Ghana, including the following:

<u>Donor Agency/Country</u>	<u>Amount</u>	<u>Purpose</u>
a) USAID	\$6 million	Feeder roads improvement over 3 years. In 1990, about 400 km are programmed for rehabilitation
b) World Bank and IFAD	Part of \$42 million	Feeder roads development and drilling of bore holes in the Volta Region
c) World Bank/IDA and African Development Bank	\$30 million	Water systems rehabilitation
d) IFAD	\$2.25 million	670 kms feeder roads rehabilitation in Northern Region

- 5.8 As can be readily seen from existing studies cited in this Report, the above projects and that of the Government are not enough. Much more needs to be done, as manifested by the high percentage in marketing costs accounted for by transportation costs. Therefore, our first recommendation for USAID

is increased financial support for the development of new feeder roads and rehabilitation of critical ones in state of disrepair.

5.9 As the previous sections of this Report have shown in clear, quantitative terms, transportation costs have invariably been eating up sizeable percentages of the total marketing costs of farmers, ranging from 30% to 50%. The higher transportation costs tend to be incurred in regions where the feeder roads are in worst conditions (unpaved, full of potholes, muddy in the rainy season and dusty in the dry, etc.) In our interviews with some enterprises hauling agricultural and other goods to and from the villages, we were informed that their transport charges were determined based on the following factors: conditions of the roads, distance, nature of the goods, and the demand for truck space in the area.

5.10 The priorities for feeder road development should be based on three key criteria, as follows:

- a) Volume of agricultural production, both current and potential;
- b) Level of transportation costs, standardized on the basis of weight or volume per kilometer (the higher, the more urgent; see Table 3.a. for comparative costs);
- c) State of disrepair of existing feeder roads

5.11 In our analysis, the feeder roads will likely have the highest marginal contribution to the welfare of small farmers and other rural families because of the following direct effects and externalities:

5.11.1 Direct Effects

- a) Improved access to village, district and urban markets;
- b) Increased availability of farm inputs. Greater availability will mean reduced average prices sooner or later, making the adoption of improved production technologies more affordable for the small farmers.
- c) Increased availability of basic necessities (consumer goods from urban areas) such as soap, fuel, cooking oil, clothing, etc. Again, since prices reflect scarcities, greater availability will reduce average price levels relative to a situation with unconnected rural and urban areas.

5.11.2 Indirect Effects and other Externalities from New and Improved Feeder Roads

- a) More price stability due to greater market integration brought about by interconnections among markets. Agricultural products differ from industrial ones in that the former are seasonal, subject to unpredictable weather and other natural risks, and are highly perishable. Those factors make for supply uncertainties that manifest themselves in oscillating surpluses and shortages. On the other hand, the demand for food is inelastic and stable. Therefore, prices rise and fall in inverse relationship to the volume of seasonal supply. Such price fluctuations increase the risks and uncertainties for the farmers, because quantitatively, the degree of risk is proportional to the extent of variation over time, as measured by the standard deviations around a central tendency (eg. mean, average, etc.) Therefore, to the extent that feeder roads can connect producing and consumption areas, they can reduce supply-demand imbalances. This can result in greater price stability, a situation that is desirable for both farmers and urban consumers, which means enhanced national social welfare.
- b) Increased bargaining power of farmers vis-a-vis traders. Some field-level studies in Ghana's rural areas (eg. student dissertations at the University of Ghana's Department of Agricultural Economics, interviews with Catholic Relief Services staff, etc.) show that at harvest time, many assemblers and traders exploit their financial leverage at the expense of the cash-needy farmers. A dispassionate analysis may somewhat justify such "unequal exchange" situation (a more passionate treatment would call it "exploitation"), by arguing that the traders/assemblers incur high transport costs due to inadequacies of roads and vehicles. Be that as it may, additional feeder roads can better equalize the exchange process, as the increased market access would allow more farmers to go directly to village and district markets, and as the number of traders who come to the farms to assemble farm products increase.
- c) Greater national socio-economic integration in the long run. Feeder and secondary roads increase social contacts among Ghanaians, not just economic

transactions. Such social contacts, in the long run, will make for improved communication and understanding among the various segments of the society: rural; urban; farmers, traders, tribal groups, etc.

Other Conveyances for Agricultural Products

5.12 The USAID might also consider helping in the other constraints in rural infrastructure. For instance, some studies have suggested that the following infrastructures also deserve investments in rehabilitation and development:

- a) Railways, such as in the Brong Ahafo and Western regions;
- b) Volta Lake transport system: clearing of the waterways for navigation, opening of more ports along the waterways;
- c) Rehabilitation of the fishing harbour.

5.13 Promotion and Development of new small Agribusiness Enterprises in the Rural Areas

This is a wide-open opportunity window for USAID, where foreign assistance is surprisingly lacking. As such, agribusiness development in the rural areas is an opportunity for a unique contribution for USAID. Most foreign assistance organisations tend to emphasize farm production, food aid, rural credit and infrastructures. The impact from those interventions, especially food aid, is quite immediate. But they tend to ignore second-generation types of post-harvest problems which, sooner or later, would dampen the first-generation production initiatives.

5.14 There are ample evidences that the ERP has had a beneficial impact on agricultural production and productivity. Processable surpluses have sporadically emerged in some corn-producing regions. As more and more farmers adopt improved production technologies, given affordable modern inputs and favourable price incentives, more processable or at least storable surpluses in root crops and cereals would be harvested. This will increasingly exert pressures on the marketing system's capabilities to dry, store, classify, transform and distribute agricultural produce.

5.15 The time for initiating the emergence of a viable and dynamic rural agribusiness system has come for Ghana. And USAID can position itself as the prime mover of such a forward-looking assistance program. Some of the key requisites for encouraging the emergence of a small-scale rural agribusiness subsector are the following:

- a) Financing for start-up investments and working capital;
- b) Training cum demonstration of simple food science and agro-processing techniques suitable to cottage/home enterprises;
- c) Training on basic entrepreneurship, simple record-keeping, and selling techniques;
- d) Training for existing production or consumer cooperatives or other forms of self-help rural organisations, eg. private voluntary organisations (PVOs);
- e) Adequate infrastructure such as feeder roads, electricity and water, as well as common facilities such as village godowns, drying equipment, etc.

5.16 The above key requisites can serve as timely entry points for USAID assistance, particularly the first three, namely; seed fund for lending to small but viable agribusiness enterprises, and rural training on food processing and small-scale entrepreneurship/management.

Systematic Collection and Dissemination of Agricultural Marketing Information

5.17 At present, marketing information collection at the Ministry of Agriculture is basically limited to price, and its dissemination is mainly oriented toward the needs of policy-makers rather than the farmers and traders. One way by which USAID can help improve this is by attaching a hands-on agricultural information expert at the Ministry of Agriculture. The expert should;

- a) install a simple but fast-turnaround marketing information system, which is trade-oriented and useful on a daily basis especially around the harvesting season.

- b) train the staff at the MOA on market monitoring, information processing, packaging, and timely dissemination: including the writing of suitable guidelines and manuals for the staff;
- c) develop the appropriate software, on the scale of a personal computer or mini-computer at most, for fast processing of data on price, stock availability, regularly up-dated harvest forecasts of key commodities, cyclical trends, and response elasticities of production and consumption activities, among others.

5.18 In addition to the financing of the expert for about 12-18 months, the USAID should finance the procurement of computers and possibly broadcasting equipment, while the MOA can provide counterpart funding for the staff salaries, printing and dissemination costs (via print and broadcast media).

Promotion of non-traditional Exports and Regional Trade (Ecowas)

5.19 This is another relatively untapped but high-potential intervention area. As shown by the analysis in the preceding chapter, the performance of Ghana in non-traditional agricultural exports is still quite low relative to its production potentials and available opportunities.

Ghana's exports to its ECOWAS partners are even more disappointing. The little exports in 1988 to ECOWAS that exceeded \$1000 in value have been concentrated on fresh pineapples (\$3,360), fresh tomatoes (\$2,000), tuna fish (\$2.7 million), yam (\$2,500), and kola nuts (\$1 million).

USAID's assistance in the promotion of non-traditional exports should involve the following:

5.20 Initiate and support a regional study among ECOWAS countries of the distinctive comparative advantages of the individual countries in strategic agricultural commodities. The study can be performed in this manner:

- a) Organise a study team in each country member, composed of nationals of each country, preferably academicians and professional consultants rather than bureaucrats;

- b) The task of each team is to identify its country's comparative advantage among a longer list of strategic commodities predetermined on the basis of resource endowments and consumption needs of ECOWAS member countries;
- c) The country teams should finish their studies within one year. At the end of the analysis phase, a regional conference/workshop should be organised by USAID to discuss and compare the country's findings, perhaps this time in collaboration with the ECOWAS Secretariat.
- d) On the basis of the above regional conference, a regional consensus can emerge on product specialization based on hard evidence of comparative advantage (rather than political rhetoric). Such a consensus can provide a modest but meaningful beginning for activating regional trade and economic integration.

5.21 Organise and sponsor private sector delegations of Ghanaian exporters (present and potential) to the USA, and also visits of groups of investors and international traders from the USA to Ghana. Aside from educating both countries' delegations on trade opportunities, this activity can also encourage similar exchanges with Japan (through JICA), and EEC countries.

5.22 Strengthen the institutional capability of the GEPC in promoting non-traditional agricultural exports, by assisting it in international market demand forecasting, developing it as a one-stop export processing office with simplified procedures, disseminating information on quality standards and economical packaging techniques, etc.

Integrated Agricultural Financing

5.23 Experiences on subsidized agricultural lending for small farmers by the World Bank, the regional development banks of Asia (ADB), Latin America (IADB), and Africa (AfDB) and government-owned agricultural banks of many developing countries have invariably yielded the following lessons:

- a) Administratively-allocated credit generally leads to rationing by the lending banks, who then tend to favour larger farmers to minimise lending costs and risks;

- b) Small farmers are more sensitive to speed of approval and disbursement than to the level of interest rate;
- c) Subsidized and administratively-allocated credit generally undermine the financial health of lending government-owned banks due to high default rates, perception of hand-outs by the borrowers, inefficiencies, and corruption.

5.24 In view of the above experiences, we recommend that USAID take the initiative for the design and implementation of a pilot project in integrated agricultural financing, with the following objectives and features:

a) Objectives

- . To finance feasible and viable marketing and agro-processing operations of individuals or cooperatives;
- . To encourage farming system diversification into cash crops and export-oriented products through a revolving credit-line loan package;

b) Innovative features

- . Credit is for 1-2 years, with close monitoring and supervision, instead of the traditional 6-month credit for production of a single crop;
- . Post-harvest activities that enhance the value of the crops are encouraged by extending the loan maturity beyond the harvesting season;
- . By removing subsidies and charging market interest rates, the lending banks are motivated to improve their services to the farmers, at the same time ensuring that only the financially viable projects get credit.

CHAPTER VI

SOME COSTS AND EXPECTED BENEFITS FROM MARKETING SYSTEM IMPROVEMENTS

Some Indicators of Investment Requirements

6.1

Priority improvements in the agricultural marketing system of Ghana will require the following four categories of investments from both the private and the public sectors:

a) Investments in physical infrastructures from the Government, including foreign-assisted ones:

- . roads, bridges, ports and other transport infrastructures
- . village, district, and urban market structures and facilities;
- . storage facilities in the villages and districts, silos and other bulk storage/handling facilities, airport cold storage, etc;
- . communication facilities for broadcasting and disseminating market information.

b) Investments in physical facilities from the private sector:

- . transport vehicles and equipment;
- . rural small-scale post-harvest facilities such as driers and warehouses;
- . agro-processing facilities, ranging from simple cold storage and freezing chambers to canning factories;

c) Investments from the government, private sector and external agencies in making available credit to the various participants in the marketing system, including farmers who need working capital to postpone selling after harvest;

d) Investments in institutional strengthening at the Ministry of Agriculture, GEPC, and other key government agencies, in terms of upgrading their capacities for policy analysis, formulation, and

implementation. These "software-types" of investments involve training, installing functional organisations and administrative systems, divestiture of selected SCEs, formulating appropriate policies and incentives for marketing entrepreneurs and exporters, etc.

6.2 It should be clear from the above four categories of investments that a comprehensive approach to improving the agricultural marketing system will require substantial financial and manpower resources from the government, the private sector, and external assistance organisations. Indeed, it would be quite presumptuous of us to even put a definitive total amount for the comprehensive "hardware and software" needs of the marketing system. Suffice it to say that improving the agricultural marketing system will probably require less total investments than equivalent improvements in the production system, as the latter requires heavy investments in irrigation, research, extension, fertilizers, chemicals and credit, among others.

6.3 Nevertheless, we have tried to put together some indicative estimates of investment requirements, as follows:

- a) Rehabilitation of the Tema Food Complex Corporation (TFCC), consisting of a flour mill, vegetable oil mill, fish mill, fish canning, fish smoking, animal feed mill, and cold storage, amounting to about C3,432 million over 2 years;
- b) Community-initiated social and economic infrastructural projects, which include access roads and markets, construction of which would be assisted and supervised by the DMECD/MLGCD, about C1,393 million over three years;
- c) Labour-intensive feeder roads project in the Eastern region primarily to generate employment (under PAMSCAD), but which will improve market access of the Eastern Region farmers, about C6,955 million (including foreign exchange component of \$20 million).
- d) Sites and structures for agricultural shows and exhibitions in Kumasi (Ashanti), about C140 million over 3 years, for land clearing and constructing booths to be rented out to exhibitors.

- e) Improvements in storage and dissemination of cost-effective post-harvest handling methods (storage, preservation and processing techniques), about C156 million over 2 years, almost all from UNDP.
- f) Bulk storage and handling facilities for GFDC:
 - . In 1986, total storage capacities for 17,500 tons were finished in major maize-producing areas in Ashanti, Brong-Ahafo, Central, and Western regions. It cost \$2.5 million, financed by a loan from the U.K.;
 - . A second phase will construct additional capacities totalling 33,750 tons in bulk and bagged storage facilities in Tamale, Kumasi, Accra, Techiman, Nkoranza, Atebubu, Sunyani, Goase, Mprumen, Forifori and Lambushie. Total cost would be C3,734 million, including \$10.5 million in foreign costs, to be financed by the Saudi fund, Danida, World Food Programme, and GFDC's own resources.
- g) Research and development on improved processing, preservation, storage, and marketing of food at the Food Research Institute, including their dissemination, pilot plant construction, and fabrication of appropriate machines:
 - . C26 million already spent in 1986-88;
 - . C546 million planned for continued research and development, including \$1.3 million in foreign costs from the EEC and the Netherlands.
- h) Development and application of intermediate technology (DAFIT) for the generation and delivery of appropriate technologies to farmers and small-scale industries in the rural areas; total cost over three years would be about C10.8 million, 50% of which is provided by USAID.
- i) Promotion of non-traditional exports, with the goal of increasing the contribution of non-traditionals to total exports from 5% to 15% over the short term, to be implemented through the GEPC. Up to 1988, some \$500,000 and C19,000 million have already been spent on this programme. An additional amount of \$61.7 million in foreign costs is budgeted over 3 years, to be financed by UNDP, ITC (Norway), and the Commonwealth Secretariat.

- j) Rehabilitation of GIHOC Cannery in Nsawam (pineapple and citrus processing facilities), amounting to a total of C86 million over 2 years;
- k) Rehabilitation of the Kool Bottling factory, for processing local fruits from the Brong Ahafo and Ashanti regions into juice, costing about C960 million over two years:

6.4 If the investment requirements for roads, bridges, ports and other infrastructures are included, the total financial requirements would easily exceed Ghana's own resource capabilities. The government's Public Investment Program has earmarked C5,580 million for the periodic maintenance of feeder roads for 1989-1991, with the goal of increasing the maintenance coverage from 18% in 1987 to 35% by 1991. It should be noted at this point that due to budgetary constraints, the government has to shift its relative emphasis from construction of new feeder roads to maintaining existing ones.

Expected Benefits from Marketing Improvements

6.5 The principal benefits from the four categories of marketing investments mentioned in 6.1 above are the following:

- a. Increases in farm productivity as a direct effect of access roads that can increase the availability and reduce the costs of modern farm inputs, as well as indirect motivating effects of more marketing access and alternatives; flexible, rational pricing policies, and other marketing incentives;
- b. Increase in farm incomes as a direct effect of better market access; improved storage, drying, agro-processing and other value-enhancing post-harvest handling activities; more flexible and rational pricing policies;

6.6 It should be emphasised that increased farm productivity and production would not automatically lead to increased farmers' income if the farmers lack marketing access, options, and capabilities. Indeed, if farms are isolated from markets, increased production can even lead to decreased net income as average prices are depressed by bumper harvests. This would then discourage farmers from planting the same crop during the succeeding season,

which would cause a lower harvest and higher prices. Such an alternating cycle of surpluses and shortages, with accompanying low and high prices (similar to a cob-web) can only be moderated or minimized if the marketing system can give the farmers better access and options. This makes any effort to improve market access not only economically sound but also imperative on social equity grounds.

6.7 Unfortunately, it requires a large amount of cross-sectional and time-series data from the rural villages of Ghana to quantify the empirical benefits of improved marketing system. Nevertheless, to give some idea of the magnitude of the benefits to be expected from marketing system improvements, we would like to cite briefly some ex post experiences in India.

6.7.1. To measure the income effects of increased marketing activities by farmers, field-level surveys were conducted across fifteen villages over a period of about 10 years.

Key findings:

- a) Higher marketed surplus, expressed as percentage of farm production rather than in absolute volume, was highly correlated with higher average income (coefficient of correlation of 0.84).
- b) Positive impact of increased commercialization was even higher than irrigation access, not only for all rural households but also on the incomes of marginal farmers and agricultural labourers;
- c) Increased commercialization initially increased income inequality in the rural villages as those with more resources took advantage of the new marketing facilities; however, absolute poverty was reduced;

6.7.2. Another study calculated the impact of market access on agricultural productivity. A spatial equilibrium model was empirically tested with cross-sectional time-series data on thirteen states of India over ten years. The dependent variable was average food-grain production in tons/hectare. The explanatory variables were high-yielding varieties, fertilizers, irrigation, annual rainfall and marketing access

variables, namely density of roads and markets, availability of trucks, and freedom of movement of food (In India, interstate trade of food grains was controlled at that time. But this should not invalidate the learning value of the Indian experience since spatial trading restrictions by regulations have the same effect as barriers to trade caused by physical isolation from markets due to lack of roads and vehicles.)

The major findings:

- a) Other things being equal, a shift from restricted trading to a totally free movement of food grains across the thirteen states implied an increase in aggregate productivity of 5%, significant with a time lag of two years; in general, market access variables had positive signs, except distance to nearest market, which had a negative sign (farm productivity decreased with increasing distance from market);
- b) Among the infrastructure variables, road density had the most significant positive effect on productivity; an interesting twist, however, was that in villages with below-average yields, infrastructure had less impact, probably because more roads meant more food imports into food-deficit villages with its depressing effect on food prices and farm incomes.
- c) Fertilizer, irrigation, high-yielding varieties, and rainfall all had highly-significant positive impacts;
- d) All the infrastructure, input and market access variables together explained 79% of the variations in aggregate farm productivity.

6.8 The foregoing empirical studies in India took more than ten years and a substantial amount of financial and high-level manpower resources. That is not quite easy to duplicate in Ghana, where a reliable field-level data base is expensive to generate and maintain. But we can benefit from the Indian studies by being cognizant of the following policy implications:

- a) Free movement of agricultural products significantly increase productivity. Trade restrictions and lack of market access decrease

overall productivity, as comparative advantages are not exploited to the fullest. This empirical finding justifies building roads and markets in the rural areas of Ghana. By logical extension, this argument can also be used to plea for lowering the protectionistic barriers in the EEC and other trading partners of Ghana, especially in the context of 1992:

- b) The productivity benefits from increased market access would be felt after about 2 years;
- c) The density of surfaced roads will increase farm productivity and income, though to a lesser extent in low-yield, tradition-bound farms; in the long run, even they will benefit as more inputs reach their farms;
- d) Density of market structures (village, district and urban markets) positively affect farm productivity, regardless of traditional or improved technology. The impact would seem to increase at a decreasing rate, reaching a saturation point at 132-161 markets per 100,000 square kilometers, beyond which density had no more productivity effects. Given an average productivity increase of about \$3 per hectare brought about by one new market per 2,000 square kilometres (radius of about 22 kilometres), and assuming an economic life of 15 years and annual operating costs of 7% of the initial investment, the internal rate of return of a new market was calculated at about 43%.
- e) Increased market access is not neutral to scale, which means in the short run, it can widen income inequalities in the rural areas. However, absolute poverty is reduced relatively fast, and as the poorer farmers catch up on important technologies and exercise more marketing options, the income inequality would decrease.
- f) Finally, because of the close interdependencies among the infrastructures, input usage, and market access variables, it is impossible, and probably useless, to try to isolate or attribute the productivity impact to any single investment, like roads, or irrigation, or price policy, or more credit. Those variables are auto-correlated, and tend to affect farm productivity and income levels in a simultaneous and

synergistic manner. But if a policy-maker must prioritize the investments in the marketing system of Ghana, we are confident in giving the top three spots to infrastructure (feeder roads and public markets), post-harvest handling facilities, and marketing credit.

Annex I-1 Changes in some Key Economic Indicators under the ERP, 1980 - 87, in percentages

	1980	1981	1982	1983	1984	1985	1986	1987
Population	2.8	2.6	2.6	2.6	2.7	2.7	3.0	3.1
Real GDP	1.3	-21.8	-2.5	-4.5	5.3	14.9	19.7	4.3
Real GDP per capita	-1.4	-23.8	-5.0	-6.9	2.8	11.9	16.2	1.2
Money supply	31.1	54.7	19.0	49.3	60.6	42.7	44.0	52.6
Quasi-money (b)	47.7	40.2	38.5	12.7	24.9	64.6	66.0	56.2
CPI (c)	50.1	116.5	22.3	122.8	39.6	10.4	24.6	39.6
Food Price index (c)	52.3	111.2	35.8	144.8	11.0	-11.4	20.3	38.3
Millions of US dollars (actual figures)								
Current a/c	29.2	-420.8	-108.6	-174.1	38.3	-134.2	-43.0	-96.9
Merchandise exports (fcb)	1103.6	710.7	607.0	439.1	565.9	632.4	773.4	625.8
Merchandise imports (fcb)	-908.3	-954.3	-588.7	-499.7	-533.0	-568.7	-712.5	-951.5
Direct investment	15.6	16.3	16.3	2.4	2.0	5.6	4.3	4.7
Millions of cedis (actual figures)								
Government revenue	2951	3279	4856	10242	22642	40311	73626	111040
Budget deficit	-1808	-4707	-4848	-4933	-4843	-7579	+239	+8911
Dollar equivalent of one cedi								
Exchange rate	0.3636	0.3636	0.3636	0.0333	0.020	0.0167	0.0111	0.0057

Source: International Financial Statistics, November 1988 and May 1987
 Quarterly Digest of Statistics, Statistical Services, Ghana Vol.6 No.1 March 1988.

Annex I-2 Ghana - Key Economic Indicators

	Actual		Prelim.		Projected		
	1984	1985	1986	1987	1988	1989	1990
----- in % -----							
GDP Growth Rate	8.6	5.1	5.3	4.5	5.5	5.0	5.0
GDY Growth Rate <u>a/</u>	5.6	4.2	6.1	4.5	5.5	5.0	5.0
GDY/Capita Growth Rate <u>a/</u>	2.3	0.9	2.8	1.2	2.2	1.7	1.7
Total Consum./Capita Growth Rate	-	0.0	1.1	-0.6	0.4	1.0	1.0
Debt Service, MLP (in US\$ M) <u>b/</u>	403	415	366	567	561	464	376
Debt Service/GS <u>c/</u>	59.7	59.2	44.6	60.5	56.1	41.8	30.1
Debt Service/GDP	5.4	6.1	8.0	12.3	11.3	8.8	6.4
Gross Investment/GDP	6.9	8.0	10.7	13.0	15.0	16.9	16.0
Domestic Savings/GDP	4.1	5.2	7.2	9.9	11.5	11.7	11.8
National Savings/GDP	4.0	4.1	6.5	8.2	10.3	11.2	12.0
Marginal National Savings Rate	-	40.0	32.8	45.8	39.3	23.0	22.5
Public Investment/GDP	2.5	3.8	5.9	7.9	7.8	8.2	8.4
Public Savings/GDP	-0.6	0.1	1.7	3.2	2.8	3.4	3.6
Private Investment/GDP	4.4	4.2	4.8	5.1	7.2	8.7	9.6
Private Savings/GDP	4.6	4.1	4.7	5.0	7.5	7.6	8.3
Ratio of Public/Private Invest.	0.56	0.92	1.21	1.57	1.09	0.94	0.67
Government Revenues/GDP	8.0	10.4	13.6	14.0	13.5	14.0	14.0
Government Expenditure/GDP	10.9	14.1	17.8	19.1	18.9	19.1	16.9
Deficit (-) or Surplus (+) GDP	-2.9	-3.7	-4.2	-5.1	-5.4	-5.1	-2.9
Export Growth Rate	-	22.4	12.3	8.7	9.1	4.6	5.4
Export/GDP	8.0	9.8	16.6	19.3	19.1	19.0	18.4
Import Growth Rate	-	6.8	13.0	2.4	5.6	12.0	9.3
Imports/GDP	10.7	12.5	20.1	22.4	22.5	24.2	24.5
Current Account (in US\$M)	-214	-263	-203	-220	-231	-299	-356
Current Account	-2.6	-3.9	-4.2	-4.8	-4.6	-5.6	-6.0

Source: World Bank Estimates

a/ GDY per capita = GDP per capita adjusted for changes in the terms of trade.

b/ Includes IMF and payments of arrears but excludes repayments of short-term oil facility borrowings.

c/ Includes private unrecruited transfers.

Annex I-3 Contribution of Various Crops to (Agricultural) GDP 1987

<u>C R O P</u>	<u>1987 Production (ton)</u>	<u>Average Price C/Ton (Wholesale)</u>	<u>C million Revenue</u>	<u>Share of GDP</u>
Cassava	2,000,000	40,000	80,000	17%
Manze	470,000	40,000	18,800	4%
Pige	350,000	80,000	28,000	6%
Cocoa	210,000	352,000	74,000 (1967)	15%
Cotton	2,000	225,000	450	-
Tobacco	2,000	136,000	272	-
Sorghum/Millet	300,000	25,000	7,500	2%
Rice	71,000	80,000	5,700	1%
Oil Palm	50,000	90,000	4,500	1%
Yam	800,000	70,000	42,000	9%
Piantain	1,000,000	60,000	60,000	13%
Cocoyam	1,000,000	50,000	50,000	10%
Vegetables	125,000	100,000	12,500	3%
Poultry (birds)	6,000,000	600	3,600	1%
Sheep	500,000	4,000	4,000	1%
Goats	500,000	3,000	3,000	-
Cattle	200,000	100,000	20,000	4%
Forestry Others*			60,000	13%
Total Agric. GDP (1987)			475 billion	100%

* Estimate.

Source: PPME, Ministry of Agriculture (1987).

Annex I-4 Livestock Population 1970-86

<u>Year</u>	<u>Cattle</u>	<u>Sheep</u>	<u>Goats</u>	<u>Pigs</u>	<u>Poultry</u>
1970	90,300	1,315,200	1,412,400	256,500	6,674,000
1984	1,077,843	1,977,331	1,678,001	417,693	8,693,123
1985	1,064,778	1,987,284	1,605,755	413,114	10,024,408
1986	1,119,976	1,809,524	1,696,755	547,553	5,306,066

Annex I-5 Fisheries Production 1983 - 86

	1983	1984	1985	1986
	<u>(Metric Tonnes)</u>			
Canoe Fishery	137,026	171,233	159,899	190,196
Inshore Vessels	68,155	60,284	17,976	21,893
Distant Water & Tuna	-	-	56,338	57,053
Total Income	205,183	231,517	234,216	269,142
Inland Fishing	45,000	48,000	50,000	50,000
Total Production	250,183	279,517	284,216	319,142

Source: M.O.A., 1988.

Annex I-6 = Production of Selected Crops: 1982 = 1988

(Thousand tonnes)

	1982	1983	1984	1985	1986	1987	1988	1989
CEREALS	544.0	308.0	1055.0	999.0	867.0	918.0	995.0	1024.0
Maize	346.0	172.0	696.0	554.0	555.0	553.0	590.0	610.0
Rice	36.0	40.0	65.0	68.0	70.0	81.0	95.0	100.0
Millet	76.0	40.0	133.0	112.0	116.0	271.0	390.0	314.0
Guinea Corn	86.0	56.0	172.0	145.0	126.0	--	--	--
STARCHY STAPLES	4431	3656	11173	9376	6016	5949	5315	7450
Cassava	2470.0	1728.0	6186.0	5193.0	2676.0	2943.0	3300.0	3500
Cocoyam	628.0	720.0	1866.0	1569.0	1005.0	1000.0	1115.0	1300
Yam	556.0	866.0	1178.0	987.0	1043.0	1001.0	1200.0	1400
Plantain	745.0	342.0	1943.0	1629.0	1067.0	1005.0	1200.0	1250

Source: Policy Planning, Monitoring and Evaluation; Ministry of Agriculture.

Annex I-7 = Area under Selected Crops

(Thousand hectares)

	1982	1983	1984	1985	1986	1987	1988
CEREALS	825.0	835.0	1276.0	1034.0	880.0	926.0	1051.1
Maize	373.0	400.0	724.0	579.0	472.0	469.0	551.0
Rice	61.0	40.0	69.0	68.0	76.0	82.0	92.1
Millet	175.0	175.0	231.0	185.0	156.0	355.0	408.0
Guinea Corn	216.0	220.0	252.0	202.0	175.0	--	--
STARCHY STAPLES	735.0	738.0	1765.0	1411.0	959.0	593.0	449.0
Cassava	339.0	339.0	813.0	650.0	387.0	422.0	449.0
Cocoyam	145.0	113.0	396.0	317.0	207.0	--	--
Yam	110.0	143.0	223.0	178.0	174.0	171.0	--
Plantain	141.0	143.0	333.0	266.0	191.0	--	--

Source: Policy Planning, Monitoring and Evaluation; Ministry of Agriculture.

Annex 1-8 Cereal Production-Demand in Ghana ('000 metric tons)

Year	Pop. (m:n)	Demand					Production					Production for consumption 2/	Surplus (+) Deficit (-)	Surplus/ Deficit as % of Demand	
		Wheat	Maize	Rice/	Sorghum/	Total	Wheat	Maize	Rice	Sorghum/	Total				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1970	6.56	31.4	251.0	66.5	135.9	547.8	0	482.0	45.0	337.0	864.0	858.5	57.7	10.6	
1971	6.79	32.7	266.9	70.3	140.8	562.8	0	455.0	55.0	303.0	813.0	861.6	15.6	3.4	
1972	6.92	34.1	282.7	73.2	144.3	577.3	0	402.0	70.0	259.0	731.0	816.7	-58.6	-10.2	
1973	6.28	35.6	274.8	74.1	146.2	592.6	0	427.0	62.0	275.0	764.0	841.7	-50.9	-8.6	
1974	6.51	37.1	288.3	75.1	148.2	606.6	0	466.0	70.0	331.0	867.0	850.3	21.7	3.6	
1975	6.63	37.6	297.4	77.0	154.1	616.3	0	343.4	59.6	257.0	670.0	476.1	-140.2	-22.7	
1976	6.75	38.5	301.5	78.0	156.0	624.0	0	266.0	55.6	333.4	659.0	469.3	-134.7	-21.6	
1977	6.85	39.1	304.9	78.8	157.6	630.4	0	312.2	62.9	272.6	647.7	459.7	-170.7	-27.1	
1978	6.99	39.9	308.7	79.9	158.8	639.3	0	265.3	60.8	256.2	588.3	417.9	-221.4	-34.6	
1979	10.12	40.7	344.1	81.0	161.9	647.7	0	306.6	63.0	307.2	676.8	481.5	-166.2	-25.7	
1980	10.24	41.4	348.2	81.9	163.6	655.3	0	354.0	64.1	292.6	710.7	503.9	-151.4	-23.1	
1981	10.37	42.2	352.6	83.0	165.9	663.7	0	334.2	43.6	301.2	679.0	479.7	-184.0	-27.7	
1982	10.50	43.0	357.0	84.0	168.0	672.0	0	264.3	37.1	246.3	547.7	387.1	-284.9	-42.4	
1983	11.99	71.9	407.7	95.9	191.6	767.3	0	140.8	26.9	220.2	387.9	274.2	-493.1	-64.3	
1984	12.29	73.7	417.9	96.3	196.6	786.5	0	574.4	76.0	315.0	965.4	683.4	-103.1	-13.1	
1985	12.60	75.6	426.4	100.8	201.6	806.4	0	395.0	80.0	305.0	780.0	554.0	-252.4	-31.2	
1986	12.92	77.5	439.3	103.4	206.7	826.9	0	578.0	82.7	290.8	936.7	662.0	-164.9	-19.9	
1987	13.24	79.4	450.2	105.9	211.6	847.3	0	553.0	81.0	271.0	905.0	641.6	-205.7	-24.3	
1988	13.65	81.9	452.2	109.2	216.4	861.7	0	600.0	95.0	300.0	995.0	706.0	-155.7	-18.1	
1989	14.00	84.0	465.8	112.0	224.0	885.8	0	610.0	100.0	314.0	1024.0	726.6	-159.0	-17.9	
Per Capita Demand (kg 1988)		6	34	8	16	64									

1/ Paddy rice

2/ Physical production is reduced by 35% for maize, sorghum and millet and millet and 20% for rice to allow for seed, feed, wastage, etc Proportions supplied by MOA.

3/ (12) = 0.7 x (8) + 0 x (9) = 0.7 x (10)

4/ (13) = (12) - (6)

5/ (14) = [(13) x 100]/(16)

6/ Estimate

Source: Computed from figures provided by Ministry of Agriculture.

Annex II-1 Percentage Differences of Monthly Wholesale Prices Between Major Urban Consuming and Rural Producing Areas (1984 - 88)

Consuming Market	Accra Urban						Eastern Urban						Ashanti Urban					
	Ac.R %	Ash.R %	E.R %	B.A.R %	U.E.R %	N.R %	Ac.R %	Ash.R %	E.R %	B.A.R %	U.E.R %	N.R %	Ac.R %	Ash.R %	E.R %	B.A.R %	U.E.R %	N.R %
Products																		
Maize																		
Mean	-1.42	21.79	11.99	47.54	6.92 ^a	53.37	-4.03	26.42	7.68	42.68	5.63	51.31	-13.36	10.90	-2.20	28.05	-2.98	35.94
Minimum Value	-21.15	-0.48	-30.76	7.43	-35.40	-25.70	-25.25	-8.82	-28.89	-22.00	-43.07	-37.59	-36.77	-18.12	-11.58	-55.65	-15.98	-25.25
Maximum Value	30.63	54.23	56.41	275.16	90.34	153.22	33.98	123.47	40.61	305.90	74.41	173.61	25.34	50.20	112.05	68.77	139.67	33.98
Standard Deviation	8.98	13.27	16.54	41.19	30.66	33.40	9.30	24.87	10.72	47.92	34.20	42.90	15.12	12.01	29.30	30.70	34.56	9.30
Rice																		
Mean	-6.26 ^a	11.55	-0.76	23.74	10.73	21.01	1.68	35.98	14.32	39.67	22.20	39.29	4.44 ^a	4.49	-1.50	17.81	4.14	16.38
Minimum Value	-22.09	-15.39	-38.76	-45.53	-26.23	-52.51	-52.94	-85.62	-24.52	-31.82	-37.01	-30.72	-55.81	-87.16	-52.58	-49.74	-52.50	-47.11
Maximum Value	15.94	78.53	153.39	209.45	157.65	129.77	65.12	199.52	190.29	240.42	205.74	162.53	141.91	43.79	229.0	197.32	99.27	141.90
Standard Deviation	14.35	17.39	40.19	46.43	40.24	25.14	29.33	46.15	43.25	50.48	46.50	31.27	48.12	28.52	50.44	36.66	38.02	29.33
Yam																		
Mean	-3.70 ^a	40.39	38.15	73.77	30.19	136.06	-2.64	94.79	25.97	69.56	24.56	98.50	-19.95 ^a	23.00	8.20	36.28	3.53	68.60
Minimum Value	-43.35	-56.36	-31.47	-11.91	-45.80	-32.14	24.02	6.33	-17.68	-15.75	-15.59	1.76	-44.55	-190.81	-75.56	-75.34	-61.08	-43.36
Maximum Value	19.12	67.48	471.02	353.83	122.20	1125.00	35.67	475.00	521.98	420.80	97.30	232.21	13.54	64.14	493.01	196.27	68.43	163.0
Standard Deviation	17.71	21.13	86.40	67.35	33.68	182.22	17.00	87.05	81.05	80.42	26.28	60.73	16.88	38.52	87.65	53.54	29.79	56.90
Cassava																		
Mean	13.79	30.43	28.84	142.60	NA	-3.88 ^a	1.85	92.11	10.18	117.63	-23.68 ^a	NA	-13.14	18.96	-8.54	73.84	NA	-45.30 ^a
Minimum Value	-86.61	-579.28	-24.87	-38.95	NA	-47.69	-41.94	-51.28	-62.59	-52.62	-61.25	NA	-67.49	-123.90	-52.36	-35.53	NA	-69.18
Maximum Value	70.57	76.28	96.85	389.08	NA	17.65	92.42	659.78	173.91	686.27	0.00	NA	47.22	64.40	121.57	385.97	NA	-21.41
Standard Deviation	22.51	87.86	32.50	97.94	NA	24	30.36	127.31	43.17	128.31	20.98	NA	28.57	33.97	28.73	74.88	NA	17.51
Tomato																		
Mean	44.92	69.15	138.7	271.23	185.35	321.89 ^a	-13.03	110.59	23.71	110.57	77.63	122.80	-31.50	18.86	3.44	68.23	55.53	104.67 ^a
Minimum Value	-55.63	-8.24	-51.79	2.50	-26.74	73.83	-95.60	8.94	-15.90	-10.26	-52.79	-18.24	-94.72	-417.70	-85.60	-76.75	-61.56	62.16
Maximum Value	288.94	91.30	393.18	552.91	542.17	507.79	162.98	310.28	198.75	326.38	361.69	225.11	83.58	76.05	100.37	197.95	380.40	174.38
Standard Deviation	68.21	15.87	102.04	137.55	157.09	190.06	53.92	77.11	42.20	77.05	105.55	89.24	42.99	85.99	41.51	59.16	102.37	44.43
Gari																		
Mean	10.12	10.73	32.95	54.66	-16.27	50.96	22.78	36.86	20.13	68.18	-0.42	37.10	15.59	8.53	9.69	35.57	-17.37	19.41
Minimum Value	-61.50	-120.95	-54.33	-78.39	-57.46	-49.73	-40.60	-100.00	-29.47	-58.92	-50.79	-23.47	-44.04	-130.92	-76.63	-56.94	-88.50	-66.66
Maximum Value	64.54	92.35	1285.83	1463.83	44.49	1206.43	117.50	400.38	64.96	1673.82	89.12	154.49	112.38	91.38	106.77	797.06	73.53	90.82
Standard Deviation	24.96	40.79	32.95	217.27	28.87	184.73	29.63	69.48	19.93	252.04	34.11	47.78	42.43	34.55	36.29	121.49	26.97	33.18

Source: Computed from data provided by PPHE, MOA.
 Note: NA - Data not available to allow computation.

ANNEX 11-2

CASSAVA: CORRELATION COEFFICIENTS FOR WHOLESALE PRICES FROM PAIRS OF MARKETS (JAN 1987 - SEPT 89)

	ACCRA	SEKONDI TAKORADI	CAPE COAST	K'DUA	K'SI	SUNYANI	TAMALE	BOLGA	WA	HO
ACCRA	1	0.286	0.255	0.761	0.491	0.235	-0.048	0.542	-0.791	-0.993
SEKONDI/ TAKORADI		1	0.090	0.597	0.257	0.400	-0.064	0.949	0.982	-0.908
CAPE COAST			1	0.230	0.695	0.676	0.447	0.826	0.700	-0.913
KOFORIDUA				1	0.496	0.795	-0.248	0.979	-0.444	0.377
KUMASI					1	0.704	0.100	-0.933	0.300	0.860
SUNYANI						1	-0.063	-	1.000	-
TAMALE							1	1.000	0.451	1.000
BOLGATANGA								1	-	-
WA									1	1.000
HO										1

ANNEX II-3

RICE: CORRELATION COEFFICIENTS FOR WHOLESALE PRICES FROM PAIRS OF MARKETS (JAN 1987 - SEPT 89)

	ACCRA	SEKONDI/ TAKORADI	CAPE COAST	K'IDUA	K'ASI	SUNYANI	TAMALE	BOLGA	WA	HO
ACCRA	1	0.818	0.827	0.903	0.670	0.212	0.870	0.716	0.936	-0.851
SEKONDI/ TAKORADI		1	0.799	0.877	0.814	0.246	0.814	0.570	0.856	-0.660
CAPE COAST			1	0.933	0.091	-0.661	0.759	0.914	0.830	-0.990
KOFORIDUA				1	0.750	0.244	0.861	0.801	0.850	-0.750
KUMASI					1	0.512	0.826	0.744	0.225	-0.783
SUNYANI						1	0.473	0.755	-0.995	-
TAMALE							1	0.831	0.805	-0.705
BOLGATANGA								1	0.635	-0.260
WA									1	-0.915
HO										1

ANNEX II-4

MAIZE: CORRELATION COEFFICIENTS FOR WHOLESALE PRICES FROM PAIRS OF MARKETS (JAN 1987 - SEPT 89)

	ACCRA	SEKONDI/ TAMORADI	CAPE COAST	K'DUA	K'SI	SUNYANI	BOLGA	TAMALE	HO	WA
ACCRA	1	0.924	0.906	0.879	0.909	0.925	0.818	0.918	0.995	0.775
SEKONDI/ TAMORADI		1	0.897	0.910	0.874	0.850	0.739	0.853	0.985	0.677
CAPE COAST			1	0.971	0.918	0.850	0.642	0.798	1.000	0.594
KOFORIDUA				1	0.866	0.900	0.625	0.726	0.975	0.569
KUKASI					1	0.925	0.653	0.792	0.995	0.557
SUNYANI						1	0.712	0.811	0.999	0.685
BOLGATANGA							1	0.921	0.993	0.984
TAMALE								1	0.997	0.850
HO									1	1.000
WA										1

ANNEX II-5

YAM: CORRELATION COEFFICIENTS FOR WHOLESALE PRICES FROM PAIRS OF MARKETS (JAN 1987 - SEPT 89)

	ACCRA	SEKONDI/ TAKORADI	CAPE COAST	K' DUA	K' SI	SUNYANI	BOLG	TAMALE	WA
ACCRA	1.000	0.429	0.762	0.879	0.727	0.880	0.843	0.864	0.659
SEKONDI/ TAKORADI		1.000	0.522	0.879	0.790	0.878	0.359	0.655	0.476
CAPE COAST			1.000	0.831	0.626	0.762	0.692	0.816	0.775
KOFORIDUA				1.000	0.604	0.860	0.753	0.755	0.735
KUMASI					1.000	0.584	0.764	0.702	0.774
SUNYANI						1.000	0.720	0.915	0.968
BOLGATANGA							1.000	0.455	0.908
TAMALE								1.000	0.806
WA									1.000

ANNEX II-6

TOMATOES: CORRELATION COEFFICIENTS FOR WHOLESALE PRICES FROM PAIRS OF MARKETS (JAN 1987 - SEPT 89)

	ACCRA	SEKONDI/ TAKORADI	CAPE COAST	K'DUA	K'SI	SUNYANI	TAMALE	BOLGA	WA	HO
ACCRA	1	0.708	0.714	0.771	0.848	0.592	0.686	0.382	0.204	0.863
SEKONDI/ TAKORADI		1	0.837	0.842	0.878	0.725	0.302	0.564	0.029	0.601
CAPE COAST			1	0.930	0.892	0.742	0.542	0.702	0.192	0.749
KOFORIDUA				1	0.903	0.764	0.612	0.752	0.233	0.698
KUHASI					1	0.784	0.533	0.544	0.227	0.860
SUNYANI						1	0.316	0.418	0.868	0.570
TAMALE							1	0.989	0.460	-
BOLGATANGA								1	0.579	0.305
WA									1	0.817
HO										1

Annex II-7 An Econometric Verification of the Relationship between the Farmgate and Retail Prices of Commodities.

The ordinary least squares method of analysis is adopted. Therefore the equation is transformed to include an error term e . Thus, $M_j = L_j + B_j P_j(r) + e$. If we define $P_j(r)$ and $P_j(f)$ as the retail and farmgate (rural market) prices, respectively, of a given commodity, then the margin can be expressed as the difference between them. $M_j = P_j(r) - P_j(f)$

Therefore $P_j(r) = M_j + P_j(f)$

But $M_j = L_j + B_j P_j(r) + e$

Therefore $P_j(r) = P_j(f) + L_j + B_j P_j(r) + e$

Transposed $P_j(f) = L_j + (1 - B_j)P_j(r) + e$

Which gives $P_j(f) = a_j + b_j P_j(r) + e$

The last equation gives a simple regression equation of rural market price [$P_j(f)$] as a function of retail price $P_j(r)$. If a_j is rejected, L_j must also be rejected because $a_j = -L_j$. Since $b_j = 1 - B_j$ if b_j is non-significant then B_j is not significantly different from 1 implying that the farm level price may not change with a change in retail price.

After estimating the values for a_j and b_j , L_j and B_j can be determined. The values for L_j and B_j can now be substituted in the original equation and define the market margin with known and tested estimates of the parameters.

If both estimates of a_j and B_j are significant, then estimates of both L_j and B_j are also significant. In which case, the equation will be $M_j = L_j + B_j P_j(r)$ (i)

On the other hand, if only a_j is found to be insignificant, then L_j is also insignificant and the function becomes

$$M_j = B_j P_j(r) \quad (ii)$$

Similarly, if b_j is found insignificant then $1 - B_j = 0$ and $b_j = 1$ so that the function takes the form.

$$M_j = L_j + P_j(r) \quad (iii)$$

Thus the monthly marketing margin over the relevant period can be computed for specific commodities from either equation (i), (ii), or (iii), depending on whether the parameters of the primary equation for the particular commodity are significant or not. The results obtained are presented in Annex II-7a to d.

REGRESSION RESULTS: REGRESSION OF RURAL MAIZE PRICES ON RETAIL (CITY) MAIZE PRICES

Annex II-7a Brong Ahafo Rural Maize

Independent Variable	Constant	Parameter	-2 P &	F	SIG F	D.W.	n
Accra	-633.18319 (0.89833)	1.03440 (6.73025)*	78.58	75.21733	0.00000	1.848 ⁺	24
Sekondi/ Takoradi	-179.66371 (0.21909)	0.82366 (6.90265)*	58.98	47.54555	0.00000	1.285 ⁺	24
Kumasi	-1283.07466 (2.12767)**	1.24286 (11.27672)*	84.58	127.16433	0.00000	2.185 ⁺	24
Tamale	675.27250 (0.56657)	0.96697 (4.30916)*	48.04	18.56905	0.00042	1.385 ⁺	20

- Notes: 1. Figures in parentheses are the computed t values
 2. Levels of significance of parameter estimates are represented by asterisks as follows:
 * - 0.01; ** - 0.05; and *** - 0.10
 3. D.W. = Durban Watson Test Statistic; +, - and ^o mean positive, negative and no auto-correlation respectively (^o inconclusive).
 4. -2
 R^2 = adjusted coefficient of determination; F = the F ratio; SIG F = exact level of significance of the regression; n = sample size.
 5. Explanatory notes in appendix.

REGRESSION RESULTS: REGRESSION OF RURAL RICE PRICES ON RETAIL (CITY) RICE PRICES

Annex II-7b Northern Rural Rice

Independent Variable	Constant	Parameter	-2 R(X)	F	SIG F	D.W.	n
Accra	4264.13011 (2.3279)**	0.38947 (3.43576)*	35.07	11.80443	0.00277		21
S/Takoradi	-2736.36222 (0.73553)	0.83659 (3.55307)*	36.76	12.52432	0.00212	1.704 ⁺	21
Kumasi	-94.91921 (0.05477)	0.73270 (5.79487)*	61.96	33.58050	0.00001	2.137 ⁺	21
Tamale	1780.92690 (1.01390)	0.71792 (5.1208)*	58.36	26.22284	0.00009	2.226 ⁺	19

REGRESSION RESULTS: REGRESSING RURAL YAM PRICES ON RETAIL (CITY) YAM PRICES

Annex II-7c Northern Rural Yam

Independent variable	Constant	Parameter	-2 R(%)	F	SIG F	D.W.	n
Accra	-3653.20277 (1.67093)***	0.56112 (6.53689)*	69.88	42.73090	0.0000*	0.653*	19
S/Takoradi	-445.52201 (0.15492)	0.32649 (3.62127)*	43.04	14.60213	0.00137	0.522*	19
Kumasi	-3381.35927 (1.64530)***	0.66409 (6.83099)*	71.73	46.56219	0.00000	1.538*	19
Tamale	-316.89587 (0.21213)	0.71858 (7.51781)*	77.63	56.51746	0.00000	1.844*	17

Notes: As above.

Annex II-7d Brong Ahafo Rural Yam

Independent Variable	Constant	Parameter	-2 R(%)	F	SIG F	D.W.	n
Accra	-1506.48331 (0.50596)	0.66928 (5.51763)*	58.37	30.44424	0.00002	1.392'	22
S/Takoradi	5507.86257 (1.28957)	0.29453 (2.14968)**	14.71	4.62112	0.04460	0.699+	22
Kumasi	1343.06751 (0.44833)	0.67746 (4.52802)*	48.15	20.50301	0.00020	1.641*	22
Tamale	4407.21709 (1.59280)***	0.81525 (4.29290)*	50.62	18.42903	0.00056	1.469*	18

Notes: As above.

Annex II-8

Structure of Marketing Margins and Costs for Selected Domestically Produced Commodities Consumed in Accra (Cedis Per Kilogram)

Production Location	Commodity	Retail Price	Farm Gate Price	Marketing Margin	Marketing Cost	(5)/(3) %	(6)/(3) %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wampong (AsP)	Maize	72.80	52.10	20.70	18.62	26.4	90.2
Techiman (EAP)	Maize	71.20	47.60	23.60	21.76	33.1	92.2
Tamale (NP)	Paddy Rice	57.00	47.20	9.80	6.50	17.2	65.7
Wampong (BAR)	Cassava	49.00	16.39	32.61	19.04	66.6	52.4
Techiman (EAP)	Cassava	48.00	13.40	34.60	19.21	72.1	55.9
Techiman (EAP)	Gari	132.35	13.83	108.52	61.77	82.0	56.9
Tamale (NP)	Groundnuts	127.40	67.50	59.90	28.14	47.0	47.0
Wampong (AsP)	Groundnuts	127.40	76.70	50.70	20.48	39.8	40.4
Kade (EP)	Oil Palm						
	Fruits	23.80	15.80	8.00	3.29	33.6	41.1
	Palm Oil	170.00	112.57	57.43	54.68	33.8	95.5

Structure of Marketing Margin and Costs for Selected Imported and Domestically Consumed Commodities in Ghana: Tema Port to Kumasi (Cedis Per Kilogram)

Commodity	Retail Price	CIF Price	Marketing Margin	Marketing Cost	(4)/(2) %	(5)/(2) %
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Wheat	98.32	24.24	74.08	40.98	75.3	55.3
Killed Flour	136.56	33.94	102.62	27.07	75.1	28.4
Sugar	102.38	36.79	65.59	40.11	64.1	51.2
Rice	112.80	46.13	66.67	31.29	57.3	45.4

Structure of Marketing Margins and Costs for Selected Export Commodities from Producing Point to Tema Port (Cedis Per Kilogram)

Production Area	Commodity	Retail Price	Farm Gate Price	Marketing Margin	Marketing Cost	(5)/(3) %	(6)/(3) %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nsuta (AsR)	Cocoa	324.19	134.97	189.22	13.02	58.4	5.9
Dorma							
Ahenkro (BAR)	Cocoa	324.19	134.50	189.69	14.58	56.5	7.7
Jumapo (ER)	Cocoa	324.19	134.82	189.37	10.59	58.4	5.6
Atakrom (BAR)	Coffee	208.10	152.36	55.74	2.91	26.8	5.2

Annex II-9

Distribution of Marketing Cost Among Marketing Functions (C/kg)

<u>Producer to Accra Consumer</u>								Post-	
Producing Point	Distance km	Commodity	Total Transport	Transport /km	Storage	Processing	Market toll	harvest Losses	Miscellane- ous
Wabong (ASPI)	340	Maize	9.3	0.03	5.42	-	0.69	5.89	3.22
Techiman (BAR)	416	Maize	11.45	0.03	6.94	-	1.38	6.54	-
Tanale (NR)	560	Local rice	4.7	0.01	6.3	2.44	-	3.24	1.26
Wabong (ASPI)	340	Fresh cass.	6.6	0.02	9.12	-	1.66	2.64	1.52
Techiman (BAR)	416	Fresh cass.	6.33	0.02	7.71	-	1.78	2.38	1.60
Techiman (BAR)	416	Garra	6.76	0.02	13.13	14.16	1.63	4.99	1.12
Tanale (NR)	560	Groundnuts	9.40	0.02	9.98	-	0.69	4.90	-
Wabong (ASPI)	324	Groundnuts	10.20	0.03	6.52	-	1.66	4.99	-
Kade (ER)	120	Palm Oil	2.70	0.02	2.24	6.89	-	6.39	0.78
<u>Importer to Kumasi Consumer</u>									
Tema Harbour	299	Wheat	8.60	0.03	8.41	17.1	-	0.55	11.29
Tema Harbour	299	Sugar	3.58	0.01	3.02	-	-	4.61	32.41
Tema Harbour	299	Imp. rice	6.05	0.02	1.96	-	-	3.81	23.30
<u>Producer to Exporter at Tema Harbour</u>									
Nsuta	367	Cocoa	6.14	0.02	6.6	-	-	9.83	-
Dormaa Ahenkro	421	Cocoa	8.08	0.02	5.42	-	-	10.43	-
Jumapo	128	Cocoa	4.22	0.03	6.17	-	-	6.60	-
Dormaa Ahenkro	421	Coffee	0.75	0.00	1.14	.64	-	7.27	0.34

Source: Computed from data in PPME, MCA Report, Studies on Marketing Costs and Margins March 1988.

ANNEX IV-1 Trends in Ghana's Non-traditional Agricultural exports, 1986-1988

Commodities and Destinations	(Values are in thousand US dollars)			
	1986 Value	1987 Value	1988 Value	%
<u>Fruits and Nuts</u>				
1. Fresh pine-apples	433.43	899.65	1,408.37	100.00
<u>Selected Destinations</u>				
a) EEC (UK)	331.09 (329.51)	612.68 (569.82)	744.50 (528.94)	52.86 (37.56)
b) ECOWAS	0.06	-	3.36	0.24
c) USA	-	-	3.09	0.22
d) Switzerland	101.78	279.83	439.39	31.20
e) Other countries	0.5	7.14	218.03	15.5
2. Fresh mangoes	26.64	14.36	6.63	100.0
<u>Selected Destinations</u>				
a) EEC (UK)	21.56 (21.56)	14.36 (14.36)	6.63 6.42	100.0 96.8
b) Others	-	-	0.21	3.2
3. Fresh banana	0.10	12.04	2.69	100.0
a) ECOWAS	0.10	-	-	-
b) West Germany	-	12.04	2.69	100.0
c) Others	-	-	-	-

Commodities and Destinations	(Values are in thousand US dollars)			%
	1986 Value	1987 Value	1988 Value	
4. Fresh avocado pears	0.54	-	.02	100.0
(All have gone to EEC countries, UK, Holland & FRG); none to ECOWAS				
5. Fresh water-melon	0.27	-	0.53	100.0
a) EEC	-	-	0.41	77.8
b) ECOWAS (Togo)	0.27	-	0.12	22.2
6. Fresh oranges	-	0.45	1.10	100.0
a) EEC (UK)	-	-	0.87	79.1
b) ECOWAS	-	0.45	0.13	20.9
7. Fresh coconut	-	0.2	4.11	100.0
EEC (FRG)	-	0.2	4.11	100.0
8. Assorted fruits and nuts	-	2.16	4.02	100.0
a) EEC	-	1.28	3.63	90.3
b) ECOWAS	-	0.88	0.39	9.7
<u>Vegetables</u>				
9. Garden eggs	-	0.73	2.26	100.0
a) EEC (UK)	-	0.73	2.24	99.3
b) Others	-	-	.02	0.7

Commodities and Destinations	(Values are in thousand US dollars)			%
	1986 Value	1987 Value	1988 Value	
10.Fresh tomatoes	-	-	2.0	100.0
ECOWAS (Togo)	-	-	2.0	100.0
11.Fresh ginger	0.97	0.20	0.78	100.0
a) EEC (UK)	0.97 (0.97)	0.20 (0.07)	0.06 0.01	7.7 (0.6)
b) ECOWAS	-	-	0.72	92.3
12.Fresh pepper	0.42	1.28	0.72	100.0
a) EEC (UK)	0.41 (0.40)	1.28 (0.25)	0.70 (0.54)	97.5 (75.4)
b) ECOWAS	0.01	-	-	-
c) Others	-	-	0.16	24.6
13.Cucumber	0.54	-	0.92	100.0
a) EEC	-	-	0.92	100.0
b) ECOWAS	0.54	-	-	-
14.Plantain	-	0.64	6.84	100.0
a) EEC (UK)	- -	0.64 (0.64)	6.76 (6.06)	98.8 (88.6)
b) Sweden	-	-	0.08	1.2
15.Sweet potato	0.15	-	0.15	100.0
a) EEC (UK)	0.15	-	0.14	93
b) Sweden	-	-	0.01	7

Commodities and Destinations	(Values are in thousand US dollars)			%
	1986 Value	1987 Value	1988 Value	
16. Cocoyam	-	-	0.45	100.0
a) EEC (UK)	- -	- -	0.44 (0.35)	99.3 (77.6)
17. Yam	84.3	106.6	183.3	100.0
a) EEC (UK)	83.9 (83.4)	106.4 (104.5)	175.5 (172.9)	95.8 (94.4)
b) ECOWAS	-	0.2	2.5	1.4
c) Others	0.4	-	5.3	2.8
<u>Marine and Fisheries</u>	14,614.4	14,351.5	20,977.7	-
18. Tuna Fish	12,747.2	11,095.2	14,298.2	100.0
a) USA	12,747.2	11,095.2	5,415.8	37.9
b) ECOWAS	-	-	2,663.8	18.6
c) Others	-	-	6,218.6	43.5
19. Assorted Flowering Plants	0.4	0.9	-	-
Norway	0.4	0.9	-	-

Commodities and Destinations	(Values are in thousand US dollars)			%
	1986 Value	1987 Value	1988 Value	
20. Medicinal Plants	18.7	29.0	84.5	100.0
a) EEC (UK)	18.3 (9.2)	28.4 (17.1)	83.6 -	98.9 -
b) ECOWAS	0.4	0.4	0.9	1.1
c) Others	-	.2	-	-
21. Kola nuts	467.4	476.8	1,031.9	100.0
a) EEC	5.4	0.8	0.03	-
b) ECOWAS	461.2	476.0	1,008.8	97.8
c) USA	-	-	23.2	2.2
d) Others	0.4	-	-	-
22) Canned foods and Beverages	2,028	1,675.6	513.1	-

Source: GEPC, Destination of Ghana's Non-traditional Exports, Sept. 1989

SUMMARY OF TRENDS ('000 dollars, except %):

	1986	1987
a) Total non-traditional exports	\$23,762	\$27,964
b) Total non-traditional agric. exports	\$17,817	\$18,789
c) Total Horticultural exports	\$550	\$1,043
d) [b] as % of [a]	75%	67%
e) [c] as % of [b]	3%	5.5%
f) Total agricultural exports	\$541,000	\$553,700
g) [b] as % of [f]	3.3%	3.4%

Source: Computed using raw data from GEPC and other sources.

SELECTED REFERENCES

1. Acquaye, Albert. PRICE DISTORTIONS IN RICE AND MAIZE IN GHANA, Undergraduate Thesis, University of Ghana, 1989.
2. Acquaye, John Allotey. THE INTEGRATION OF GHANA'S DOMESTIC RICE MARKET, Undergraduate Thesis, 1989.
3. Alhassan, R. ECONOMIC EVALUATION OF STORAGE OF GRAINS IN THE NORTHERN REGION, University of Ghana, 1989.
4. Anthonio, Q.B.O. PROBLEMS OF MARKETING AGRICULTURAL PRODUCE WITH REFERENCE TO FOODSTUFF IN NIGERIA.
5. Asante, Asumaning-Brempong & Bruce. GHANA: GRAIN MARKETING STUDY FOR THE MEDIUM-TERM AGRICULTURAL DEVELOPMENT PROGRAMME, MOA/IBRD, August 1989.
6. Asiedu-Saforo K. ECONOMIC REFORM PROGRAMMES AND AGRICULTURAL DEVELOPMENT, Macro-Policy Sequencing in Ghana, 1983-88, in the Food Policy Journal, November 1989.
7. Ayeh, Patrick. PROFITABILITY OF FARMER GRAIN STORAGE - A CASE STUDY OF MAIZE FARMERS AT SEKYIDUMASI STUDY OF MAIZE FARMERS AT SEKYIDUMASE AREA, Undergraduate Thesis, University of Ghana, 1981.
8. Azinim, A. MAIZE MARKETING IN GHANA - PRIVATE PERFORMANCE AND PUBLIC POLICY, MSc Thesis, University of Ghana, 1980.
9. Economic Intelligence Unit, COUNTRY PROFILE, GHANA, 1987-1988.
10. FAO, ECOWAS SEMINAR ON AGRICULTURAL PRICE POLICIES IN ECOWAS REGION, FAO Project TCP/RAF/4406, Working Paper, May 1985.
11. Forde, Cecil Kwame. A STUDY OF THE MARKETING OF YAM IN THE ATEBUBU DISTRICT, Undergraduate Thesis, University of Ghana, 1977.
12. Goldberg, et.al. AGRIBUSINESS MANAGEMENT FOR DEVELOPING COUNTRIES (Latin America and Southeast Asia), Ballinger/Harvard Business School, 1974 and 1977.
13. IBRD, GHANA: AGRICULTURAL SECTOR REVIEW, Report No. 5366-GH, August 1985.

14. IBRD, EXCHANGE CONTROLS AND PARALLL MARKET ECONOMICS IN SUB-SAHARAN AFRICA: FOCUS ON GHANA, World Bank Staff Working Paper No. 711, 1984.
15. ICRISAT, AGRICULTURAL MARKETS IN THE SEMI-ARID TROPICS. (Proceedings of the 1983 International workshop), 1985.
16. IFAD, GHANA: SMALLHOLDER CREDIT. INPUT SUPPLY AND MARKETING PROJECT, Pre-Appraisal Report, 1989.
17. IFAD, REPORT OF THE SPECIAL PROGRAMMING MISSION TO GHANA, Report No. 0105-GH, July 1988.
18. Jefferey, S.T. MARKETING OF STAPLE FOOD CROPS IN GHANA, Undergraduate Thesis, University of Ghana, 1977.
19. Kilmer & Ambruster (ed.), ECONOMIC EFFICIENCY IN AGRICULTURAL AND FOOD MARKETING, Iowa State University Press, 1987.
20. La-Anyane, S. THE AGRICULTURAL INDUSTRY OF WESTERN AFRICA, Ghana Universities Press, 1988.
21. MFEP (Ghana), PUBLIC INVESTMENT PROGRAMME, 1989 - 1991, February 1989, Vols. 1 & 2.2.
22. MOA/FAO, NATIONAL AGRICULTURAL MARKETING DEVELOPMENT PLAN, FAO Project No. TCP/GHA/4504, 1987.
23. MOA/FAO, REPORT OF THE PILOT STUDIES ON MARKETING COSTS & MARGINS, March 1988.
24. Odotei, Odoi-Okpoti. AN ANALYSIS OF YAM MARKETING IN THE EJURA DISTRICT, Undergraduate Thesis, University of Ghana, 1977.
25. Osei, Achampong Kofi. AN ANALYSIS OF FACTORS AFFECTING THE COSTS OF HANDLING AND STORAGE OF MAIZE - (A case study of farmers and traders in Ejura and traders in two markets in Accra), Undergraduate Thesis, University of Ghana, 1977.
26. Perig-Ubaa, Paul. RICE MARKETING IN SELECTED AREAS OF THE UPPER REGION, Undergraduate Thesis, University of Ghana, 1979.
27. Sefa-Dedeh, Kwadzo, Plahar. MEDIUM-TERM AGRICULTURAL DEVELOPMENT PROGRAMME FOR AGRO-INDUSTRIES IN GHANA, MOA, August 1989.
28. Statistical Service. QUARTERLY DIGEST OF STATISTICS, Various Volumes.

29. Tripp, Marfo, Dankyi, & Read. CHANGING MAIZE PRODUCTION PRACTICES OF SMALL-SCALE FARMERS IN THE BRONG AHAFO REGION, CRI/CIMMYT, February, 1987.
30. Vordzorgbe, Seth. AGRICULTURAL DEVELOPMENT UNDER THE ECONOMIC RECOVERY PROGRAMME, A FIRST STAGE REVIEW, USAID, November 1986.
31. Vordzorgbe & Manarolla. GHANA: THE VANGUARD OF SUB-SAHARAN AFRICA ECONOMIC REFORM, USAID/Ghana, Oct. 1987.