

PN-ACA-548

**Non-Traditional Agricultural Exports and Natural  
Resource Management in Ghana:  
Practices and Prospects**

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1994

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## EXECUTIVE SUMMARY

Beginning at the time of its independence in 1957, the government of Ghana has actively been promoting non-traditional exports (NTE) in an attempt to reduce the country's historical dependence on cocoa. In 1984, a Structural Adjustment Program supported by the World Bank and inspired by continued slumps in world cocoa prices, led to the introduction of Ghana's Economic Recovery Programme (ERP), a prominent feature of which has been additional support for NTEs. Its strategy focused on increasing exports of a variety of high-value products that are in demand both in temperate countries and other African nations, and that are suitable and economical for production and manufacture in Ghana. Policies and institutional capacities were established to support and facilitate the marketing and export of these products by the private sector.

The dramatic expansion of NTEs over the past ten years (from US \$1.9 million in 1984 to \$62 million in 1990 and about US \$110 million in 1994) suggests that NTEs will continue to have a strong role to play in the ongoing economic development of the country.

Non-traditional agricultural exports (NTAEs) constitute an important subsector of overall NTE growth.<sup>1</sup> When the recent round of NTAE initiatives was formally introduced, only six crops were being exported. Now, over 60 products are being exported to the global market. Three of Ghana's leading NTAE crops – pineapples, kola nuts, and yams – have all seen dramatic production increases, in part a response to the government's promotional efforts, and in part a response to the ongoing decline of the cocoa trade.

The analysis of the NTAE business at the individual, village, and national levels shows net advantage to the country in the following:

- i) Diversified economy both at the village and national level.
- ii) Increased foreign exchange for the nation.

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<sup>1</sup>In this context, the concept of "non-traditional" refers to: a) crops which are 'new' or exotic to Ghana (not produced traditionally in Ghana), or b) crops which have been traditionally produced for local consumption, but are now being exported in foreign markets or in unprecedented volumes.

- iii) Improved employment opportunities and income.
- iv) Introduction of new technology and capacity building.
- v) Stimulation of private entrepreneurship.

From the government, individual and social perspectives, the NTAE is a profitable business, (that is, total financial benefits exceed total costs). These success have not come without a price, however, particularly in the form of environmental degradations and socio-economic disruptions.

Generally speaking, the production of NTAE crops is considered a mixed blessing in the villages where the crops are actually cultivated. While there have been tangible improvements in household incomes and the quality of socio-economic life, there have also been considerable deteriorations in the quality of the local environment. The government's active promotion of NTAEs, for example, has resulted in increased levels of deforestation and soil degradation, heightened levels of agro-chemicals in the nation's soil and water, and the erosion of local genetic resources and national biodiversity.

In addition, the socio-economic benefits of NTAE production have not been uniformly distributed. The increasingly mechanized nature of production of some NTAE crops, especially pineapples, clearly favors large-scale producers. The social inequities that have come as a consequence of this has led to the displacement of poorer farmers and subsequent disruptions in the production of subsistence crops, and the increased use of marginal lands and inappropriate farming techniques – all of which have environmental consequences of their own as a result of the inherent interconnectedness of human activity and the natural resource base.

The promise of NTAEs has already been demonstrated. The continued realization of this potential, however, requires that increased attention be given to the impacts of NTAE production on both Ghana's natural and human resource base. The challenge is to ensure that production is environmentally, economically, and socially sustainable.

This study of three NTAE-producing communities was undertaken in an attempt to gauge the sustainability of current production practices. Assessed in this capacity

were the pineapple-producing center of Kuntuse in Nasawam District, the kola nut production center of Kwahu Praso in Kwahu South District, and the yam-producing area around Atebubu in the Atebubu District. As the results of all three surveys suggest, if the sustainability challenge is not met, the government's current promotional policies will lead instead to environmental disasters and social conflicts whose direct and indirect price will far outweigh the monetary returns of increased exports.

As illustrated by the three village studies, the specific local-level environmental impacts of non-traditional agricultural exports vary considerably and depend largely on the type of crop, production technologies, and prevailing agroecological conditions. Some of the production practices currently being practiced degrade the natural resource base. Though the results of this degradation have not generally had time to manifest themselves, indicators suggest that the resulting negative impacts will result in high costs – not only to producers, but to the country as a whole when they translate into off-farm resource degradation, or 'externalities'. These activities definitely require mitigation measures.

In contrast, some environmental impacts may be neutral or even positive. For example, certain production practices facilitate soil conservation or enhance agricultural diversity. These cases offer valuable lessons for the sustainable development of NTAE activities and objectives.

As the three community-level studies suggest, the sustainability of Ghana's current NTAE Programme depends upon a host of environmental and socio-economic factors, most of which have just barely begun to be appreciated, much less assessed. A comprehensive and accurate evaluation of the overall impacts of NTAE production clearly needs to be carried out before these factors lead to adverse or even irrevocable consequences. Among some of the more pressing factors which need to be considered are:

- i) The price distortions leading to the degradation of resources;
- ii) The costs imposed by externalities;
- iii) The effect of time, i.e., the often protracted time lag between cause and effect;
- iv) The effects on traditional resource management systems;
- v) The renewable qualities of the resources being used;

- vi) The change in the use of the resources and whether that change is reversible or irreversible.

The complex interrelations that exist between human activity and environmental well-being defy simple cause and effect assessments. As the production of NTAE crops depends directly upon, affects, and is affected by the natural resource base, a full understanding of NTAE production and its potential in Ghana requires knowledge of all the environmental impacts that the production of these crops entails. Among the more obvious of these are their repercussions on vegetation, soils, water, human health, since these are the impacts that will influence productivity, yields, profitability, and hence the long-term viability of NTAE activities.

To this end, all available knowledge and expertise must be taken full advantage of in an attempt to fully and accurately evaluate the effects of the government's NTAE promotion activities on Ghana's rich, but vulnerable natural resource base. Among the relevant institutions that should be called in to lend their assistance are the Environmental Protection Agency (EPA), the Ghana Standard Board (GSB), the Crops Research Institute (CRI), the Food Research Institute (FRI), the Forestry Department (FD), and the Plant Protection and Regulatory Services (PPRS). In accordance with their specific capabilities and mandates, these agencies should be charged with the responsibility of providing support and services, especially in the following areas:

- i) Policy, legislation and institutional development.
- ii) Standardisation and quality control.
- iii) Environmental standards and public /occupational health safety
- iv) Education and training
- v) Monitoring and evaluation
- vi) Research and development

Though Ghana needs the foreign exchange that it earns from its NTAE activities for a variety of worthy social goals, that income comes at a price, and there are some costs that Ghana cannot afford to pay. The government has the authority and responsibility to provide an appropriate enabling environment to ensure that the production of NTAEs is environmentally sustainable, financially rewarding, and socially beneficial. What is needed now is a package of policy incentives and

programs that will encourage and facilitate the production of NTAEs on a sustainable basis.

The desire for export diversification, combined with the push by international development agencies for an export-oriented development strategy, were the main rationales for the emphasis on NTEs since the launching of the ERP in 1984.

Notwithstanding the fact that the ERP made the promotion and production of NTAE crops a priority, the sector is still facing a number of problems. Efforts have been made by the government to introduce incentive schemes, credit guarantee, overseas trade promotion, 100 percent foreign exchange export proceeds, corporate tax rebate, bonded warehouse facility, duty exemption, institutional back-up services, and small loans, to promote the NTAE business.

However, these schemes have not achieved the desired results in terms of growth of foreign exchange earnings due to a number of problems which need further attention by the government. These include:

- i) Cumbersome bureaucratic procedures in obtaining the necessary permits.
- ii) Uncooperative attitude of some officials responsible for issuing permits.
- iii) Limited assistance to stimulate production.
- iv) Absence of facilities to process the raw material before export.
- v) Absence of adequate warehousing facilities.
- vi) Inadequate infrastructure - roads, cargo facilities, information and communication.
- vii) High cost of inputs i.e. fertilizers, agro-chemicals.
- viii) Lack of markets
- ix) Dependence on foreign investment for production and exports.
- x) Prices and profits determined by external demand factors.

Government and donor efforts have focused on improving the export of NTAEs. Much less attention has been given to improving production, principally because production is not an immediate constraint. Yet this study shows that unless production is improved, the long-term viability of NTAEs will be jeopardized.

As the results of the three community studies show, the environmental impacts of NTAE production practices vary tremendously by crop and in accordance with production methods. Pineapples appear to have some of

the most threatening consequences of the three crops in that they require large amounts of chemical inputs which end up being dispersed throughout the local environment where they cause ecological destruction and human health hazards. In addition, cultivation techniques that emphasize yields result in land degradation, not only on the land actually being cultivated in pineapples, but upon adjacent lands that are now being called to produce the subsistence crops that commercial pineapple production is forcing out.

Less devastating are the impacts of both kola nut and yam production, primarily as both require substantially less agricultural inputs. The expansion of production of these two crops, however, has resulted in increasing deforestation. In the case of kola nuts, it is also resulting in biodiversity losses in Ghana's forest zone.

The socio-economic impacts of the production of these three crops are equally skewed towards pineapples where intensive cultivation practices encourage the accumulation of larger and larger farms. The inevitable consequence of this is the displacement of smaller farmers and an increasing disparity in incomes between small and large-scale producers. As yams and kola nuts are still typically produced by smallholders, these effects are substantially minimized.

Clearly, there is a need to look more carefully at the process of production for all NTAE products. Up to now, the government of Ghana has been primarily concerned only with increasing production levels in an attempt to generate larger export earnings. Their attitude, and that of facilitating donors such as USAID, has been that there are few constraints in the production of NTAE products and that hence, they should be concerned more with enhancing their marketing.

Though there is certainly much that needs to be done to improve marketing, this study suggests that there is also much to be concerned about in the production process as well. If present practices are not carefully monitored and revised, there is the very real possibility that NTAEs will end up costing more in social and environmental terms than they are able to bring in. To prevent that from happening, the government needs to work with the producers to come up with strategies that minimize the adverse environmental and socio-economic impacts. Unless directed and specific actions are taken in the near future, NTAE production in Ghana will not be sustainable, and the results will be only a further deterioration of the natural resource base and a decrease in the quality of life for most Ghanaians.

More specifically, the package of reforms needed include:

- (a) Control of the importation, distribution, sale, and use of agro-chemicals.
- (b) Adoption of sustainable farming system, i.e., organic farming practices, IPM, and agro-forestry for the production of NTAE crops.
- (c) Development of environmental management plans for large-scale NTAE crop farms.
- (d) Introduction of Environmental Impact Assessment before the production of the NTAE crops in fragile environments.
- (e) Development of land use plans for NTAE villages.
- (f) Provision of back-up services, i.e., infrastructural facilities, credit facilities, extension services, training and education of farmers, marketing, packaging and advertising facilities.
- (g) Development of quality standards for NTAE products.
- (h) Processing some NTAE crops before they are exported.

Only time will tell whether the economic returns that the Ghanaian government's promotion of NTAEs to date can be maintained. While the increases in production and earnings have been impressive, so too have been the results in other nations. Many of these countries are better able to compete in the global market by virtue of superior quality products, better infrastructure and transportation capacities, and/or lower production costs.

Future promotional activities will thus need to take into account not only the sustainability of current production practices, but Ghana's relative strengths and weaknesses as a producer of NTAEs. Although the overall objective of reducing the country's historical dependence on cocoa is being accomplished, it remains to be seen exactly how beneficial current NTAEs have been to the natural environment and traditional Ghanaian society.

## A. EXPORT AGRICULTURE IN GHANA: AN OVERVIEW

Agriculture is by far the largest sector of the Ghanaian economy, accounting for half of the GDP and employing just over 50% of the national workforce. Given the generally favourable rate of agricultural resources to population, this sector is destined to play a key role in Ghana's continued economic development. This role will include: earning foreign exchange; generating public revenue; generating private capital; feeding an expanding non-farm population; and providing raw materials for industry.

### A.1.1 Land Resources and Use

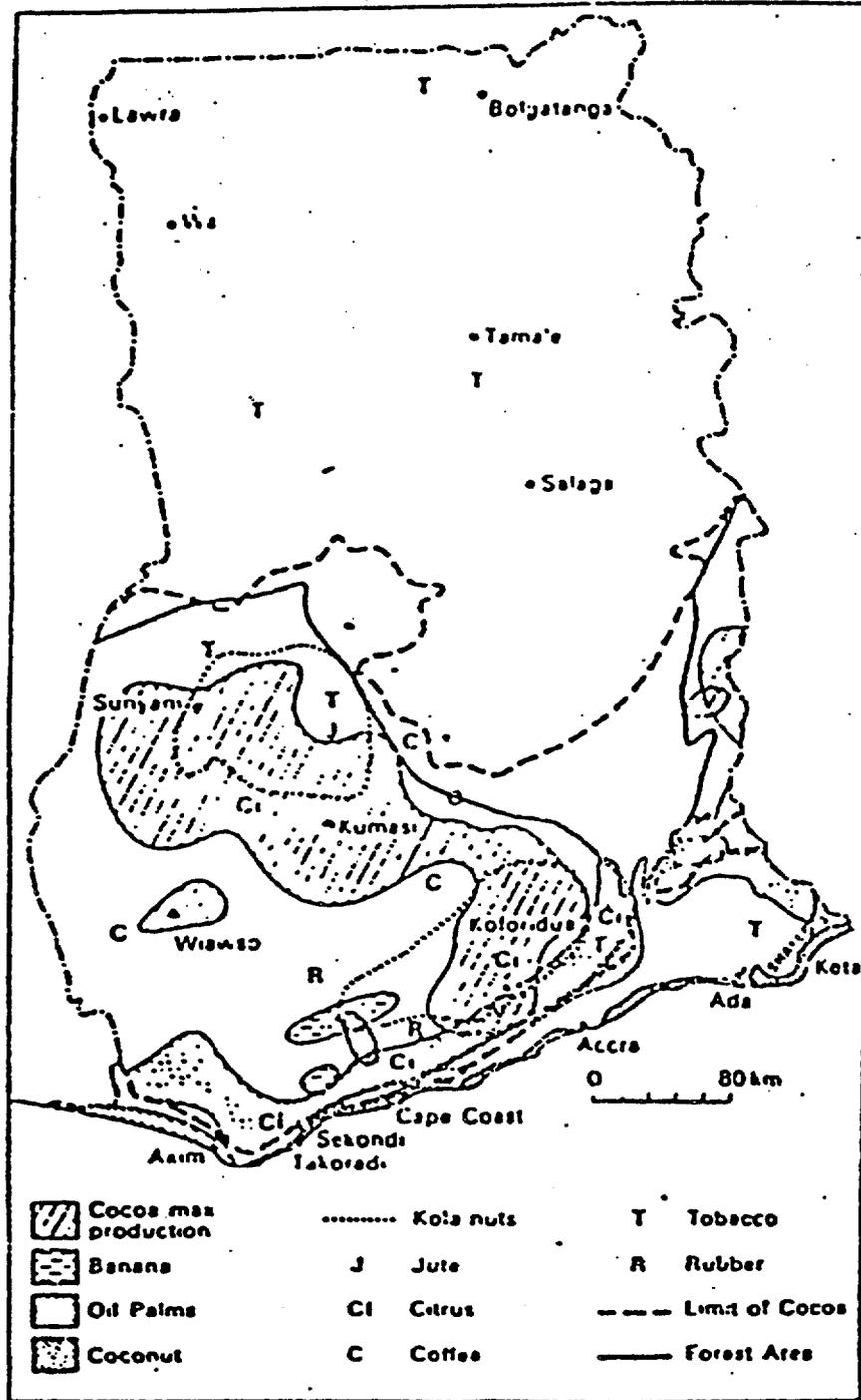
Ghana's two main ecological zones, forest and savannah, are joined by a transitional area that varies in accordance with local conditions. The forest zone, which occupies the central part of the country, is divided into the eastern semi-deciduous forest, with an annual rainfall of 1,142 to 1,651 millimetres, and the western high rainforest, where rainfall can be as high as 2,100 millimeters. The topography of the former is composed of gently undulating hills separated by numerous small drainage valleys and gullies. The soils vary from red, sandy loams and light clays at the top of the slopes to grey, gravelly sands on the lower slopes. Alluvial sands and clays predominate along the watercourses. Given the prevailing high temperatures and humidity, all of the eastern semi-deciduous forests are suited to the production of coffee, cocoyams, plantains, citrus fruit, cassava, and other root crops. (see map 1)

The area of greatest economic productivity in Ghana, however, coincides with the zone of dense forest, and includes mineral as well as agricultural products.<sup>2</sup> The red, upland soils, however, are ideal for cocoa -- Ghana's traditional leading export crop -- as well as coffee, rubber, pepper, palm oil, and palm kernels, the country's other traditional export crops. Timber is the major forest export commodity. The forests have many valuable hardwood species, only a few of which have been exported in any volume as logs and sawn timber. Non-cultivated agricultural and forest products include kola nuts, rubber, hides, ivory, and salt from the lagoons. The extraordinary growth in the agricultural export trade since the last quarter of the 19th century,

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<sup>2</sup> The most significant exception is copra which comes mostly from a narrow coastal strip.

map 1: Distribution of Commercial Crops



has brought the inhabitants of the forest zone a degree of wealth unrivaled in the rest of the country.

Because of the heavy rainfall and subsequent leaching, soils in the western high rainforest tend to be highly acidic. As such, they are well suited to the production of oil palms, rubber, and rice, but limited in their adaptability to other crops.

Ghana's savannah lands are divided into two zones: northern savannah and coastal savannah. The northern savannah comprises nearly three-fourths of the country. Annual rainfall here is between 1,143 and 1,270 millimetres, most of which falls between mid-April and mid-October. The topography consists of gently undulating ridges with broad valleys and isolated low hills. These conditions are favourable for mechanized agriculture.

The natural vegetation of the savannahs is grass with scattered shrubs and trees. This is Ghana's major grazing region, but the long dry season is a severe limiting factor. To the extent that the water supply permits, the grasslands are grazed by cattle. This is also the part of the country where most of the draft animals (bullocks) are found, although hand cultivation still predominates.

The soils of the northern savannah are mostly loamy or sandy and suited to the production of yams, groundnuts, guinea corn, rice, and beans. The distance from the larger markets, however, effectively limits large-scale commercial crop production. Population distribution is uneven, with some areas being practically uninhabited and others quite crowded.

The considerably smaller coastal savannah region fans out gradually as it extends eastward, increasing to about 96 kilometres in width at the Togoan frontier. The annual rainfall here varies from 635 to 1,143 millimetres. The soils are mainly heavy clays, although there are also considerable areas of sandy and loamy soils along the piedmont. These areas are suitable to the production of rice, sugar cane, vegetables and traditional subsistence crops. Most of the cultivation is still done with hand tools, though conditions are suitable for both draft animals and mechanical power.

Major products for domestic consumption are: beef, millet, Guinea corn, yams, rice, maize, and groundnuts in the North; plantains, cocoyams, maize and cassava in the forest region; and beef, cassava, maize, rice, and vegetables on the coastal plain. Internal distribution of

these commodities is handicapped by the lack of transportation and storage facilities.

For the most part, annual crops are cultivated by hand according to traditional systems of bush fallowing cultivation, a practice based on the agricultural reality that the accumulated supply of humus is quickly exhausted as a result of the high temperature and humidity. Traditionally, three to five years of cropping is followed by three to ten years of fallowing during which the soil is allowed to regenerate naturally. Very little animal manure is available in most areas, and the use of chemical fertilizers, while increasing, is still very limited.

#### A.1.2 Traditional Management Practices

Given the labour-intensive nature of most traditional cultivation, the area that can be farmed by one family is small: generally less than five acres. Since yields are low, so is production per family. Generally speaking, cocoa yields the highest return per acre. As a result, cocoa farmers tend to have incomes that are substantially above average.

According to traditional systems of communal ownership, land belongs not to individuals but to the tribe or clan. The chief dispenses usage rights to individual plots, usually exacting payments in cash or kind. Modifications to this system have occurred as agriculture has become more commercial and as tribal law and custom have given way to national administration and laws. Cocoa and other types of tree-crop farming, for example, have brought about a more formal tenure system. Individual ownership of land with a recorded title is now possible in many areas, and the Government is proceeding with a survey and title-recording program. In addition to the significance that tenure issues have on security and soil conservation, they are also important to credit and capital formation.

Ghana's present economic structure began to evolve in the closing years of the last and the early decades of the present century, when the natural resources of the forest belt began to be exploited for export. Robert Szereszewski (1965) has summarized this development as follows:

...Capital started to accumulate around cocoa, mining and timber industries, and strong migratory movements of labour, both internal and external, followed. Urbanization, the development of new services and the provision

of social and economic infrastructure were largely restricted to the areas of favourable natural resources and to the coastal centres which were the seats of administration and points of contact with the outer world.

Over the course of the next fifty years, this pattern of development would be enhanced and deepened as production levels of the British colony's three major export commodities remained high. When independence was achieved in 1957, the new country of Ghana had one of Africa's most productive and stable economies. Though it has continued to rely upon the contributions made from the lesser traditional export crops of palm oil and palm kernels, rubber, and coffee, most of Ghana's post-independence economy remained dependent upon cocoa.

## A.2 COCOA

### A.2.1 History of Development

Cocoa, also known as cacao, is indigenous to South America. It was first mentioned as having been grown in the former Gold Coast in 1815, but these early attempts were rendered futile by the prolonged and general tribal warfare which prevailed in most parts of the country throughout the first three decades of the nineteenth century.

In 1843 the Basel Mission began its second invasion of the country, carrying out its work under the aegis of the Danish Government. In 1857, a missionary at an agricultural station at Akropong received some cocoa seedlings from Surinam. Though these trees all died, a further consignment proved more successful. Nine years later, the first cocoa pods were harvested, some of which were replanted at Akropong while the rest were distributed to the other stations of the Mission at Aburi, Mampong, and Odumase.

Following the successful plantings in Mampong, cocoa cultivation spread rapidly, initially along the Akwapim Ridge and later, in the Eastern Region, Ashanti, and the Western and Volta Regions (see map 2). By the turn of the century, cocoa had become fully established in the southeastern part of the closed forest. Its rapid expansion into the rest of the forest region was made possible by

improvements in road transport, the building of railways, and the energy of migrant farmers from the older cocoa areas.<sup>3</sup>

Cocoa, which soon replaced rubber as the dominant export crop, experienced a phenomenal growth from the first recorded shipment of 55 kilograms in 1885. By the 1920s, Ghana was the world's largest producer of cocoa -- a title it would hold well for nearly fifty years. Though significant peaks of 311,000 and 316,000 tonnes were recorded during the 1936 and 1959-60 seasons respectively, cocoa production would continue to expand until 1971-72 when the single largest crop of 462,000 tonnes was harvested. (See Table 1)

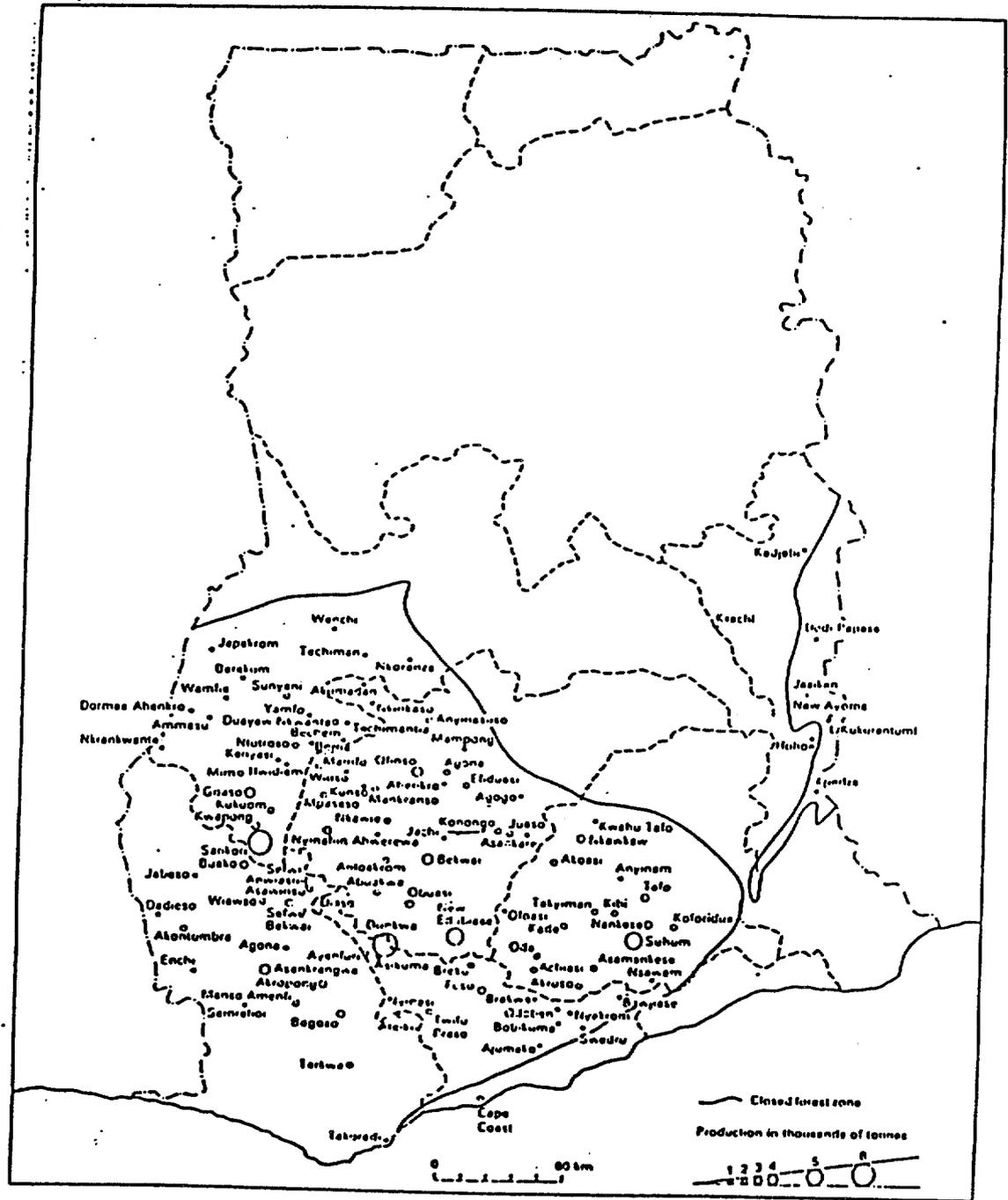
**Table 1: Cocoa Export in Quantity in Quinquennial Periods**

<u>Period</u>	<u>Total Shipments (Tons)</u> <u>Average Per Year</u>
1892 - 1896	62
	12
1897 - 1901	1644
	329
1902 - 1906	23855
	4771
1907 - 1911	104669
	20934
1912 - 1916	291528
	58306
1917 - 1921	591451
	118290
1922 - 1926	1029292
	205858
1927 - 1931	1128662
	225732

Source: A. W. Cardinall. *The Gold Coast*, 1931

<sup>3</sup> Despite the historical evidence from the Basel Missionaries, the prevailing belief among Ghanaians is that cocoa was originally introduced to the country in 1879 by Tetteh Quarshie, a Ghanaian blacksmith and farmer, who brought the first seeds from Fernando Po. According to this legend, it was Tetteh Quarshie's "pioneering" efforts that aroused the interests of Ghanaian farmers and resulted in the phenomenal development in the industry.

map 2: Cocoa Production in Ghana, 1984



Apart from the climatic and ecological suitability of Ghana's forest zone for cocoa cultivation (see maps 3 and 4), there are other factors which helped to make cocoa cultivation a major industry. First, improvements in the transportation system, specifically road and railway construction. Second, the technique of intercropping cocoa seedlings with food-producing nurse crops helped overcome the problem of food supplies in frontier areas and in uninhabited forest areas. Finally, the expansion of cocoa farms into new forest areas was facilitated by the prevailing system of communal land tenure which allowed members of the owning clan or family easy access to cultivable lands.

The development of the cocoa industry was made even more significant by the fact that it was achieved by the nation's farmers with virtually no assistance from the government. Then as now, cultivation is almost exclusively in the hands of a large number of individual farmers.

For about fifteen years after gaining its independence, Ghana continued to be the world's largest producer of cocoa. A full half of the country's agricultural land was given over to cocoa production which was also the major source of employment. In 1959, for instance, cocoa accounted for over 80 percent of the total value of exports of principal agricultural and forest products (See Table 2). The 1960 population census indicated that over half a million people (40% of the total population) was directly dependent upon cocoa production including some 300,000 farmers, 50,000 caretakers, 90,000 family workers, 68,000 labourers, and numerous clerks, drivers, and others involved in exporting the crop to overseas markets.

**Table 2: Ghana Value of Exports of Principal Agricultural and Forest Products, 1959.**

Item	Value in L(000)
Bananas and Plantain	46
Coconuts	28
Kola nuts	762
Lime Juice	71
Dried fruits and preserves	3
Coffee	380
Cocoa beans	68,779
Cocoa butter	26
Cocoa paste	1,066
Copra	205
Palm Kernels	116

Oil seeds, oil nuts	124
Natural rubber	64
Timber	13,279
Hides and skins	45

Source: Monthly Accounts Relating to External Trade of Ghana, December, 1959.

As a result of the thriving and lucrative cocoa industry, Ghana was able to enjoy a standard of living well above that of other West African nations. Beckman (1976) estimated that Ghana's per capita GNP in 1960 was more than twice that of nearby Nigeria and almost three times that of India. The dominant role of peasant production, especially in the cocoa industry, resulted in a relatively wide distribution of the prosperity, often in sharp contrast to other post-colonial economies based on foreign-owned mines and plantations.

During the 1970s, total output of cocoa declined by more than 50% and Ghana's share of the world cocoa market fell from one-third to 12%. In recent years these trends have been reversed and the cocoa industry in Ghana has been revitalized. Though cocoa continues to be Ghana's major commercial crop, and is still an important source of employment, its prominence has diminished substantially -- principally because other exports have increased.

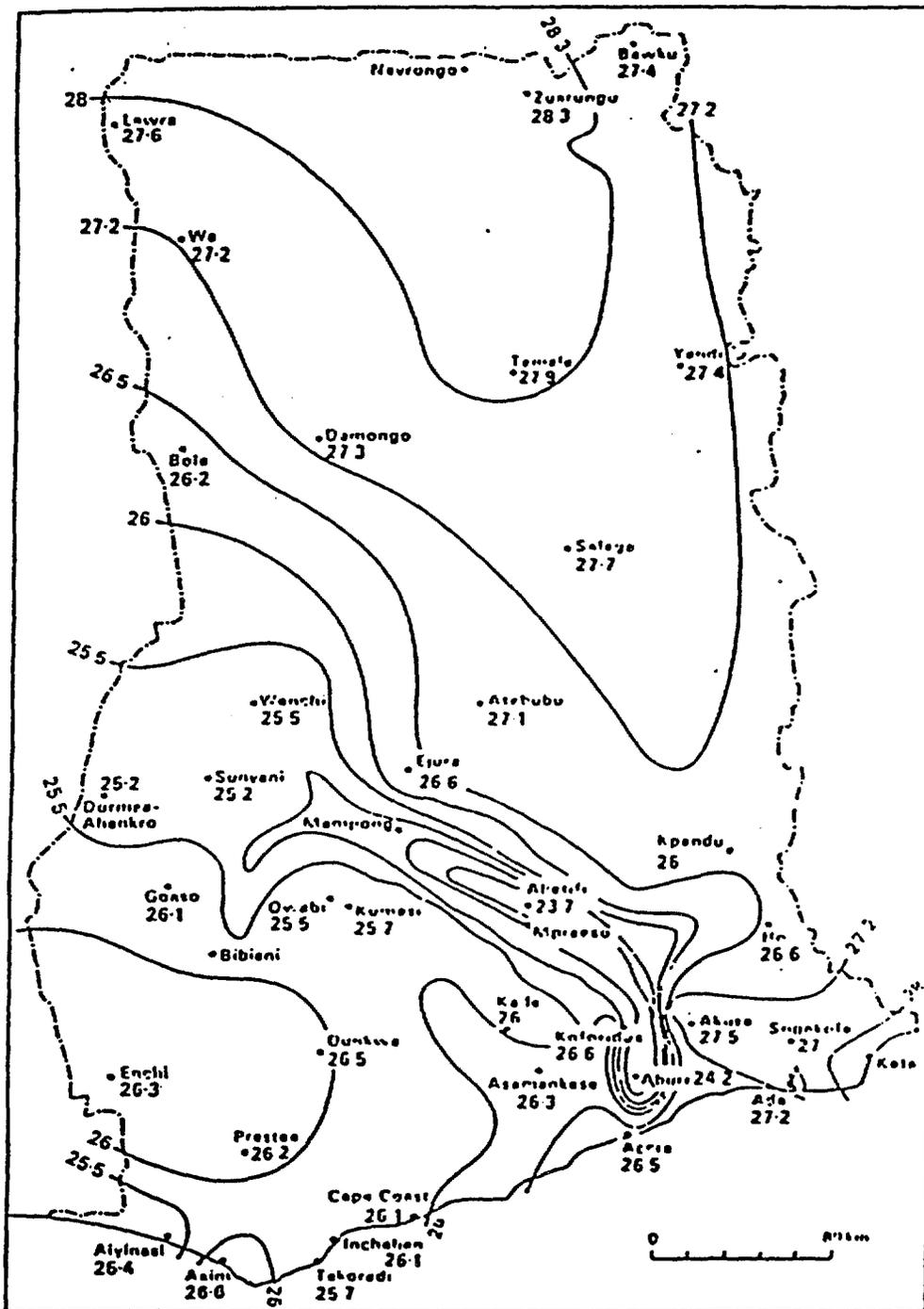
#### A.2.2 Cultivation Methods and Requirements

Today, two varieties of cocoa are cultivated in Ghana: *Amelonado*, which was the first to be introduced and is more popular; and the Amazonian type which was introduced in the 1950s. The *Amelonado* variety takes at least five years to bear fruit while the Amazonian type takes only three to four years to mature.

Cocoa cultivation is generally done in conjunction with food crops. Preparation of the land usually begins some months in advance of planting. The forest is cleared, though some trees are left standing to provide essential shade for the young cocoa trees. The debris is then burnt during the height of the dry season. At the start of the rains, the shade and ground crops -- mainly cocoyams and plantains -- are planted. Once these crops have grown sufficiently, the cocoa seedlings are either transplanted via the "bare-root seedling" method or planted via the "beans at stake" method.

The "bare-root seedling" technique, which was commonly practiced during the early days of the industry, involves raising seedlings in nursery beds in

map 3: Mean Annual Temperatures (°C)





damp places before transplanting them in the field with a cutlass. The "beans at stake" method consists merely of planting the beans at the point where the cocoa tree is desired to grow. Though much simpler in terms of time and effort, this method is much more dependent upon timing since the beans are vulnerable to destruction by rodents. The best time to plant is between September and November. Very little weeding is done no matter which method is used; that which is done is mainly to ensure maximum yields from the nurse crops. The cocoa trees themselves don't receive much attention until they start bearing fruits, which is somewhere between three and five years depending on the variety.

As cocoa pods can be harvested over a period of time, the crop is arbitrarily divided into a main crop and a mid-crop in response to marketing demands. Harvesting of the main crop begins around September and may continue until mid-January. The mid-crop season usually begins in May and lasts until mid-August, when there is a break of about three weeks before the main crop season begins again. Harvesting is done by men, women, and children who collect the pods. The pods are opened and the fresh beans are removed and fermented for a period of up to six days. The fermented beans are then transferred to raised platforms made of sticks and covered with mats for drying.

#### A.2.3 Trade

Early on, the purchase and sale of cocoa in the country was almost exclusively in the hands of private, foreign companies, all of which maintained an efficient network of agents throughout the cocoa growing areas. The only indigenous body involved in the cocoa trade was the Ghana Cooperatives.

In 1947, the colonial government established the Cocoa Marketing Board (now known as the Cocoa Board). This body was responsible for ensuring stable prices for cocoa on the local market and that part of the profits accruing from the sale of cocoa on the world market were used for the social and economic development of the country.

In 1958, the newly independent government created the United Ghana Farmers Cooperatives. The new company, which took over the assets of the other purchasing agents, was invested with the exclusive responsibility of buying cocoa. In 1966, however, the new military government cancelled the monopoly enjoyed by the United Ghana Farmers Cooperatives in an attempt to

arrest the ongoing collapse of the cocoa trade and bolster the staggering economy. The older agents were invited to renew their activities.

Today, the Board is solely responsible for the sale of Ghana's cocoa on the world market. As a general policy, the Board fixes the local price substantially below the world price, the difference of which is to be saved on behalf of the farmers. In recent years, the government has increased the share to farmers and used part of these savings to invest in educational programmes and infrastructural development in the cocoa-growing areas.

#### A.2.4 Diseases

As with any mature and well-established agricultural industry, the cocoa industry in Ghana has undergone a number of outbreaks of disease. The most serious and persistent of these have been repeated outbreaks of swollen shoot disease, a contagious viral disease that first threatened the crop in 1936. As its name implies, the virus causes a series of swellings on the trunk. Though remedial treatments are available, the most effective way of combatting swollen shoot disease is to destroy afflicted trees before the virus can spread.

Another devastating disease that has afflicted the cocoa industry is known locally as sankonoabe or akate. It is caused by an insect pest, Capsia, which destroys the shoots of the cocoa trees, thus retarding normal development and fruiting. This disease is quite widespread, but can be effectively combated by spraying the affected trees with Gammalinzo, an insecticide which kills the capsids and revives the dying trees.

#### A.2.5. Additional Characteristics

Perhaps the most significant feature of the cocoa industry in Ghana is that it is almost exclusively in the hands of the local population. Moreover, although the Government has encouraged the establishment of nurseries and the planting of the seedlings, the growth of the industry has been primarily due to the efforts of local populations who have responded to the opportunities of a new cash crop.

As pointed out by Beckman (1976), foreign-owned plantations or foreign settlers played virtually no role in the development process though the government did start several state plantations. The driving force was a stratum of rural entrepreneurs investing in land and labour,

moving to areas where soils were most suitable and where land could be acquired through leases or purchase. Polly Hill (1963) has documented the pioneering role of farmers in the Akwapim Hills, where cocoa was first grown, and their migration to the forests of the Eastern Region.

The development of the cocoa industry has resulted in the promotion of new relations over land and labour. This traditional system of individual family production within a framework of communal land tenure has gradually given way to private or semi-private property rights. Land is now bought and sold, and farms mortgaged and auctioned. As a result of these market forces, an increasing number of farmers have become tenants in areas where, only a generation or so ago, they could have claimed a share of communal lands.

In the same vein, bringing the cocoa crop to market has introduced far-reaching changes in traditional farming practices. Traditional systems of shifting cultivation were maintained for the purpose of subsistence food production, but the fields which had once been left to fallow were increasingly being planted with young cocoa plants. As a result of their commercial activities, farmers found it increasingly difficult to care for their subsistence farms. They resorted to hiring labour, generally immigrants from a neighbouring country. These labourers are hired most commonly as share croppers, receiving one-third of the crop in accordance with a system known as *abusa*.

Wage labour has also come into extensive use. The cost of this labour, however, constitutes an ongoing problem for the cocoa farmers. Because of the competition from other industries such as mining, manufacturing, and timber, labour costs have risen considerably. As a result, many small-scale farmers -- who have little disposable cash anyway -- are no longer able to secure the hired labour they need.

#### **A.2.6 NTAE Crops and Other Cash Crops**

Since 1960, the world producer price for cocoa has steadily declined. Recent falls have been particularly dramatic: as recently as 1975 the world producer price was US \$3,160 per tonne. By 1990, it had fallen by more than two-thirds to US \$1,050. Meanwhile, the producer price for kola has been steadily increasing, especially in relation to cocoa. For example, in 1970 the producer price of 62.5 kilos of cocoa was 18.40 cedis while the equivalent price of the same quantity of kolanuts was 54

cedis, nearly three times as much. It was differentials such as this, combined with the instabilities in the cocoa business, that encouraged cocoa farmers in Kwahu Praso and other areas of the country to shift to kola nut production.

The widespread shifts away from cocoa, Ghana's traditional main foreign exchange earner, to NTAE crops has naturally meant that cocoa now accounts for a smaller percentage of export revenue. While Ghana has experience and expertise with regard to the cocoa industry, the production of NTAE presents a different challenge altogether.

The cocoa industry is well developed in Ghana. Its forward and backward linkages are well established and gives employment to thousands of Ghanaians. It is also the sector which receives the most government attention in resource allocation (finance and technical back-up) and support. Any change of shift affects the country. The opportunity cost of kola nuts production is the decline of the cocoa industry, since the two crops compete for space in the same ecological zones of the country.

### **A.3 PALM OIL AND PALM KERNELS**

Oil palms are indigenous to the forests of West Africa. The palm fruit consists of a pericarp, or a red fleshy fibrous outer layer, which covers a nut containing a seed, or kernel. Palm oil is extracted directly from the pericarp while the palm kernels are obtained by cracking open the nuts. Palm kernel oil is used in the manufacture of soap, margarine, candle, and paint. For centuries, the fruit of these wild palms have been used for domestic purposes, and the pericarp oil, reputed for its richness in proteins and fat, has been the primary cooking oil used throughout Ghana's forest zone.

#### **A.3.1 History of Development**

Until the establishment of plantations in the 1950s, the oil palm industry in Ghana had developed on its own; no attempts had been made by local farmers or the government to improve the quality of the naturally growing palms or to plant them in pure stands. The two areas of greatest concentration were Krobo areas in the Eastern Region and Ahanta/Eastern Nzima areas in the Western Region though large concentrations were also found in the forest remnants in the derived savannah zone and in the northeastern part of the coastal savannah zone and around Dzodze in the Volta Region.

Along with kola nuts, palm oil became an important export commodity in the first half of the 19th century, replacing the slave trade which had been abolished by the British in 1807. Palm oil became the industry of choice in southern Ghana where it grows naturally.

By about 1880, palm oil and palm kernels had become the Gold Coast's leading agricultural exports. In 1884, export quantities reached an all-time peak of 20,000 tonnes of palm oil and 40,000 tonnes of palm kernels. Afterwards, exports of these items declined mainly as a result of the following:

- i) Inefficient methods of preparation resulted in lower quality exports and consequently, lower prices from European merchants.
- ii) Lack of adequate transport facilities resulted in high transportation costs within the country and income declines for the farmers.
- iii) The emergence of cocoa as a far more profitable cash crop.

Between 1900-1904 some 13,000 tonnes of palm oil were still being exported, but volume steadily declined. By the 1950s, total production was consumed within the country. Exports of palm kernels have fluctuated from 13,500 tonnes per year in the 1900-4 period to 2,452 tonnes in 1951.

### A.3.2 New Trends

Since the 1950s, the government has promoted the cultivation of oil palm by supplying improved seedlings to farmers at subsidized prices. A number of oil palm plantations have also been developed at the insistence of the government and the number of private plantations is also increasing. The oil palm "belt", which has an average width of some 24 kilometres, extends from Asesewa in the Eastern Region to Aiyinasi in the Western Region. In the past, this belt was covered by one dense mass of oil palms, but the felling of the trees for palm wine (the sap from the palm) and the subsequent use of the land for food farming, means that the oil palm is now found only in scattered groves.

Palm wine is a major product of the oil palm and is produced in considerable quantities wherever oil palms grow. When consumed fresh, it is a pleasant and nourishing drink, but it becomes quite potent when allowed to ferment. It can also be distilled to produce an even stronger alcoholic drink known locally as

*akpeteshie*. Traditional methods of palm wine tapping necessitate felling, and thus destroying, the tree. Attempts to introduce a less destructive method have not been successful.

## A.4 RUBBER

### A.4.1 History

Before the emergence of cocoa, rubber (*Hevea brasiliensis*) was Ghana's major export crop. First exported in 1880, rubber was obtained from tapping the Landophia vine and the Funtumia tree, both of which grow naturally in the closed forest. By the early 1900s, rubber had become a major agricultural export. But its position was short-lived for two reasons. First, many of the rubber vines and trees were over tapped, often by unskilled tappers. This resulted in irreparable damage to the trees. And second, the quality of Ghanaian rubber was low compared to the high-grade rubber which had begun appearing on the world market from Southeast Asian plantations.

Rubber received little attention from the Division of Agriculture except during the First and Second World Wars. Rubber became an important export crop again particularly during the Second World War when Far Eastern supplies were cut off from the western consumers as a result of the Japanese occupation. Ghanaian production lines were reestablished both by retapping trees in established plantations and utilizing wild (*para*) rubber sources.

After the war, rubber production dropped off and has never recovered. The price of rubber has either been too low or has fluctuated too much to encourage the establishment of rubber plantations, especially as farmers prefer to cultivate other perennial crops such as cocoa, oil palm, and coffee.

### A.4.2 New Development

Beginning in the 1960s, attempts were made to revive the rubber industry, especially in the Western Region where the heavy rainfall is ideally suited for the growth of the tree. Through a subsidy scheme, the Ministry of Agriculture has been instrumental in encouraging farmers to establish plantations of *Hevea brasiliensis* (or *Para* rubber) which is native to the equatorial forests of Brazil. By 1963, there were seventy-eight rubber farmers cooperatives in the Western Region cultivating a total of 2,023 hectares. Other government-owned plantations have been established since then, but the bulk of the

rubber produced in Ghana today goes to the local tyre manufacturing factory. Only a small amount is exported.

#### A.5 COFFEE

Coffee was added to the list of agricultural exports after the 1850s, and by the 1890s the crop was being extensively cultivated in Akwapim and Krobo areas in the Eastern Region. Interest was stimulated by the prevailing high market prices and the distribution of seedlings – either free of charge or at a very low price – from the botanical and agricultural station at Aburi (later the Aburi Botanical Gardens). Before the outbreak of the First World War, the Germans also encouraged the cultivation of coffee in the Volta Region, which was then part of the German colony of Togoland.

The most widely grown species in Ghana are robusta (*C. canephora*) and a variety known as "niaouli", which is believed to have originated from a district with that name in the Republic of Benin. The main coffee producing areas are the forests of western Brong Ahafo, Sefwi in the Western Region, southern Ashanti, the area around Hohoe in the Volta Region, and in Kwahu in the Eastern Region.

Coffee has been grown almost exclusively as a cash crop with most of the beans being exported directly. In recent years, however, some coffee has been locally processed. The biggest obstacles to high-volume and high-quality production are poor management, irregular harvesting, haphazard processing of the bean, and the competition from cocoa cultivation.

Coffee is planted as seedlings in the same manner as cocoa. If the seedlings establish themselves successfully, the coffee "farm" is weeded as necessary to ensure continued growth. If they do not, the natural regeneration is allowed to proceed and the land is used instead for food farming.

#### B. PURPOSES: THE ORIGIN, HISTORY, AND STATE OF NTAEs IN GHANA

As far back as the 1950s, the dangers of over dependence on a single agro-export crop became apparent when cocoa price fluctuations reduced revenues and adversely affected the economy. The need to diversify the economic base was clearly recognised by Ghana's first president, Dr. Kwame Nkrumah. A socialist

by ideology, Nkrumah introduced state participation into various sectors of the economy in the first Seven-Year Development Plan (1963-1970).

Agriculture was particularly targeted, and a number of state-run institutions were rapidly established to undertake collective production. These institutions included the State Farms Corporation, the Workers Brigade, the Young Farmers League, the United Ghana Farmers Council, and the Food Marketing Board. By the end of the 1963-64 financial year, the State Farms Corporation was cultivating a total of 20,746 acres. (see Table 3)

**Table 3: Area (Hectares) Under Cultivation by the State Farms 1963-1965**

<u>Crops</u>	<u>1963-64</u>	<u>1965</u>
Rice	3,596	7,183
Maize	2,719	3,893
Guinea Corn	374	-
Groundnuts	1,692	2,956
Tobacco	265	656
Fibre (Lobata)	294	1,497
Rubber	4,270	9,222
Oil Palm	4,182	7,257
Coconut	202	1,060
Citrus	178	667
Banana	586	1,012

Source: State Farms Annual Report, 1963-65.

By the end of the next year, an additional 10,634 acres had come under cultivation, most of it from three crops: rice, rubber, and oil palm.

Even though the objective of breaking the over-reliance on one export crop was a worthy one, the farms themselves did not prove to be cost effective. This was partially the result of Nkrumah's second, and hidden, objective: using the State Farms and Workers' Brigade camps as employment centres for youth and party supporters. As a result, the farms were grossly overstaffed, inefficient, and often relied upon inappropriate technologies.

Soon after the government of Dr. Nkrumah was toppled in 1966, all the state institutions which had been introduced into agriculture were abolished and the farms were abandoned. There would be no conscious efforts by the succeeding regimes to assist the agricultural sector

until 1969 when the National Liberation Council (NLC) Military government established the Ghana Export Promotion Council (GEPC). Like the State Farms Corporation, the GEPC was established in an effort to diversify the national economy. By then the overdependence on cocoa had been transformed from a risk to a reality by outputs that had steadily fallen from 1959-1960's record high of 450,000 tonnes. Compounding the problem was the erosion in world producer prices that further reduced earnings. The GEPC's mission was to secure additional foreign exchange from the exports of non-traditional goods, and use those revenues for socio-economic development.

Despite the establishment of the GEPC, not much progress was achieved during the 1970s. The body itself was ineffective and constrained by two fundamental problems: it had no well-defined policies and programmes, and no funds to encourage the participation of private entrepreneurs. The GEPC continued to be a relatively marginal institution until it received additional impetus and recognition under the National Economic Recovery Programme (ERP). Launched in 1984 as part of a World Bank-sponsored structural adjustment program, the ERP emphasized the promotion of NTAEs. Success stories from Latin America contributed immensely to the recognition that NTAEs constituted a major potential earner of foreign exchange in a country like Ghana where an acute shortage of investment resources limited development opportunities.

The Provisional National Defense Council (PNDC) government of Flt. Lt. Jerry Rawlings introduced a number of new initiatives to promote non-traditional exports (NTEs). These have taken the form of: reorganisation of export-related institutions, simplification of export procedures, establishment of production and marketing infrastructures, provision of incentives for prospective producers and investors, and export-driven educational programmes. Assisting in the design, development, and funding of these programmes has been the United States Agency for International Development (USAID). Through its US \$80 million Trade and Investment (TIP) Programme, USAID has played a major role in the developmental planning process that has as its goal increasing the contribution of Ghana's NTE sector to the national economy.

## **B.2 GOVERNMENT POLICIES AND PROGRAMMES FOR THE PROMOTION OF NTAES**

More than three decades of government promotion of NTAEs has proven that getting the farmers to production NTAE crops is not a problem: if anything there is usually an oversupply of products during certain periods of the year. On the other hand, a number of basic obstacles have been identified. Among the most prominent of these are marketing bottlenecks, periodic market gluts, and a lack of efficient export and transport processes. In an effort to address the root causes of these obstacles and mitigate their effect, the PNDC government has introduced a wide-reaching set of enabling policy initiatives and implementing institutions. An overview of those activities and bodies is given below.

### **B.1.1 Institutional Arrangements**

#### **B.1.1.1 Overseas Trade Promotions**

The Ministry of Trade and Industry (MOTI) is responsible for the formulation of the country's internal and external trade policy. It is also responsible for the development and promotion of Ghana's exports, especially the non-traditional export items, and tourism. These missions are carried out by the three divisions of the Ministry, namely, the Foreign Trade Division, the Tourism Division, and the Export Trade Division.

The Foreign Trade Division is responsible for: preparing draft trade agreements and protocols; participating in negotiation of trade agreements and protocols; advising on trade policy, particularly the goods which Ghana can export to the various countries as well as what those countries would like to import from Ghana; and monitoring the operations of the agreements and protocols.

Export activities are promoted by the various overseas trade offices whose responsibility it is to:

1. Set up showrooms or showcases to display both traditional and non-traditional Ghanaian exports.
2. Develop contacts to promote the importation of Ghanaian products.
3. Assist in organising Ghana's participation in overseas trade fairs.

4. Conduct research into the availability of markets for Ghanaian exports.
5. Transmit information on market conditions and requirements for various products to the MOTI.
6. Provide information on the sale of Ghanaian products in foreign markets.
7. Prepare and submit status reports on those importers wishing to do business with Ghanaian exporters.

Locally, the MOTI assists exporters through its ten regional offices, each of which is staffed with a Regional Representative who is responsible for implementing trade policy and serving as a liaison between the region's exporters and the GEPC.

#### **B.1.1.3 Ghana Export Promotion Council**

The agency with primary responsible for the promotion of NTAEs continues to be the Ghana Export Promotion Council (GEPC). Established in 1969 by National Liberation Council (NLC) Decree 396, the GEPC mandate was to "promote, assist, and develop exports in any manner which the Council considers necessary or desirable."

Although originally intended to be an autonomous organization, the GEPC was made into an agency of the Ministry of Trade and Industry. Its funds are now appropriated through the national budget, and staff compensation is controlled by the Price and Incomes Board (PIB). The total labour force of about seventy-five operates through five main divisions, namely:

- i) Product development
- ii) Trade information, public relations and export services
- iii) Market development
- iv) Planning research and development
- v) Finance and administration

Under these five divisions are various departments that deal with specific issues and mandates. As its name indicates, the Trade Information, Public Relations, and Export Services Division is comprised of three departments. It is this last division that is the most

significant from the perspective of export promotion, and hence, most critical to the promotion of NTAEs.

As spelled out in Decree 396, the main areas of GEPC responsibility are as follows:

1. Obtain information on all products with export potential and determine the extent and location of any market for those products outside Ghana;
2. Call the attention of potential customers to the availability of goods of Ghanaian origin;
3. Organise trade fairs in Ghana and overseas, and arrange for attendance at foreign trade fairs where Ghanaian products can be promoted;
4. Bring Ghanaian sellers in touch with foreign customers and encourage exploratory discussions between them;
5. Create interest in, and goodwill for, Ghanaian products by promotional activities, including advertising, exhibiting, and providing information about such products;
6. Make available expert advice and assistance to Ghanaian businessmen concerning export procedures, credit and collection arrangements, shipping documentation, marine insurance, and similar matters;
7. Assist Ghanaian businessmen travelling abroad by supplying advance information and, where possible, on-the-spot advice;
8. Assist foreign visitors in examining business opportunities involving "made in Ghana" goods;
9. Find out about and recommend to Government such trade agreements and pacts that will have the effect of promoting the sale of Ghanaian goods in overseas markets;
10. Organise an insurance credit guarantee scheme for the protection of Ghanaian exporters;
11. Act as a centre of information for the Ghana Export Company Limited, and for all individual exporters;

12. Find out about and recommend to Government what assistance should be given to Ghanaian exporters to enable them to compete effectively in overseas markets;
13. Apply for, and receive, in Ghana or elsewhere any trademarks, licenses, protections or concessions, and in relation thereto, do all things as the Council (GEPC) considers necessary or desirable for the development of exporters; and
14. Discharge any other function which may be prescribed by regulation.

#### **B. 1.1.3 Simplification of Export Procedures**

In order to facilitate and promote NTAEs, the GEPC has simplified the exporting process. Under the new regulations, the first requirement is that any prospective exporter must be legally registered as a Ghanaian business. Once the enterprise is so registered, the following steps then need to be followed:

1. Register with the GEPC as an exporter (the fee is C25,000 for the first year, and C20,000 each year thereafter).
2. In some sub-sectors, contract prices must be approved. In the case of wood products, for example, the Timber Export Development Board (TEDB) will approve contract prices for a fee of one percent of the Freight-On-Board (FOB) value of the intended shipment. The GEPC sets some prices, such as for handicrafts, but other contract prices are negotiated between producers, trader, and buyers depending on grade and market fluctuations.
3. In some sub-sectors, the Customs, Excise and Preventive Service (CEPS) will check shipments for quantity and quality. For example, the Forest Products Inspection Board (FPIB) charges a fee equal to two percent of the FOB value of a shipment to inspect for quantity.
4. Complete an A2 form that is then filed with a bank once a Letter of Credit has been opened or, depending on the product, contract prices have been approved. (A2 forms, which are readily available at all commercial banks and

from the Bank of Ghana (BOG), serve as a means to monitor foreign currency transactions and retention rates.)

5. Transport the shipment to the port of embarkation.
6. Have a forwarding agent prepare the shipping documents, and secure the necessary customs certifications.

#### **B.1.1.4 Product Associations Assistance**

Though each individual exporter has his own specific needs and concerns, there is a wide range of issues that are common to all, e.g., foreign exchange retention, warehousing at the ports, custom controls, transportation costs, and bureaucratic constraints. To address these shared concerns, exporters have banded together into approximately fifteen (15) product associations and organisations. These organisations vary greatly in type, level of development, the quality of service they provide to their membership, and the level of interaction they have with the relevant government organisations. The five main associations concerned with NTAEs are:

1. The Ghana Assorted Foodstuffs Exporters Association
2. The Ghana Yam Exporters Association
3. The Horticulturists Association of Ghana
4. The National Association of Kola Nut Dealers
5. The Vegetable Exporters Association

As their name suggests, these associations deal with commodity-specific issues. In general, they help their members deal with basic export activities, i.e., producing or buying the product, sorting or grading the product, packing the product, transporting the product to the point of shipment (seaport or airport), and collecting the necessary permits.

The members are required by the association constitution to abide by the following practices and etiquette:

1. Do not fax a letter of credit. It is not safe.
2. Do not promise to export what is not in your power to export.
3. Do not undersell your fellow Ghanaian exporter in the same market.

4. Do not send high-quality samples and follow-up with inferior products.
5. Do not mix your export produce with drugs or other unacceptable items.
6. Replace all damaged products when the fault is yours.
7. Promptly discharge whatever financial obligations you owe the importer of your products.

## **B.2 INCENTIVES AND DISINCENTIVES FOR NTAE BUSINESS**

### **B.2.1 Credit Guarantee Scheme**

In 1969, the Bank of Ghana instituted a Credit Guarantee Scheme for small-scale borrowers in order to stimulate a greater flow of institutional credit to operators of small units in agriculture, industry, transport, and commerce.

Initially, three programmes were established:

1. A guarantee of 66.3% of the loan amount for all types of small-scale borrowers. (Fee charge of 1%);
2. A guarantee of 75% for small-scale borrowers purchasing an "alien" business. (Fee charge of 1.6%); and
3. A guarantee of 100% for borrowers who have technical capability or experience, but who have no start-up or initial equity share capital. (Fee charge of 3%).

Though all banks in the country participated in the Credit Guarantee Scheme programme, most of them started to lose interest in the mid 1980s. The scheme has since been revised to include:

- Revised credit guarantees (the maximum liability of the Bank of Ghana, in case of default, was raised from C50,000 per borrower to C3 million).
- A 100% guarantee programme of special credit arrangements for the importation of raw materials by Ghanaian manufacturers.
- An Export Credit Guarantee Scheme.
- An Export refinance scheme.

Other credit facilities which are being considered by the Bank of Ghana and the Ministry of Finance and Economic Planning include export production credit, and export resources and refinancing credit. In spite of all these programmes, a lack of credit is still a major obstacle to many potential exporters and producers in all sectors of the economy. As a result, many exporters still face substantial pre- and post-shipment financing problems.

### **B.2.2.3 Other Export Incentive Schemes in Operation**

#### **100% Exchange of Export Proceeds**

In June 1992, the government approved a scheme that allows exporters to exchange all foreign exchange proceeds from non-traditional exports into cedis at competitive rates negotiated with their bankers. (see Box 1) This replaces the 35% retention scheme which was thought to be functioning as a disincentive.

**BANK OF GHANA**  
**NOTICE TO BANKS AND THE PUBLIC**  
**NOTICE NO. BG/FO/94/2**  
**BANK OF GHANA**

**EXCHANGE OF NON-TRADITIONAL  
EXPORT PROCEEDS INTO CEDIS**

Further to Bank of Ghana Notice No. BG/FO/93/1 of September 1, 1992 permitting non-traditional exporters to retain 100 per cent of their export proceeds, it is announced for the information of banks and exporters that such export proceeds may be negotiated by exporters at competitive rates with any bank of their choice.

Exporters who wish to negotiate their export proceeds with a bank other than their bankers, may request their bankers to transfer the funds to the account of the bank of their choice.

For the avoidance of doubt, non-traditional exporters who do not wish to exchange their export proceeds into cedis may retain such proceeds in their foreign exchange accounts.

In order to encourage the development of non-traditional exports and to ensure that such exporters obtain maximum value for their earnings, all banks are requested to comply fully with this Notice.

October 20, 1994 - Ghanaian Times

### Corporate Tax Rebate

This scheme allows any manufacturer or person engaged in agricultural production who is exporting part or all of his production to claim a tax rebate valued at between 40% and 75% of his tax liability.

### Bonded Warehouse Facility

Manufacturers can obtain a customs license to store imported raw materials that will be used in the manufacture of goods intended for export in secured places without payment of duty.

### Duty Drawback Scheme

This facility allows exporters to draw back up to 100% of duties paid on materials imported to produce goods for export.

### Duty Exemption

This scheme operates alongside the duty drawback scheme by enabling exporters to enjoy a 100% duty exemption on certain imported items that are intended to go into exports.

### National Award for Export Achievement

This is an annual national event held to recognise exporters for their contribution towards the economic well-being of the nation. This was introduced in 1989 and several exporters have been honoured.

### B.2.3 Loans for Exporters

The Government of Ghana, in collaboration with the International Development Agency of the World Bank, has recently embarked upon a US \$51 million project to promote non-traditional exports. (see Box 2) Initiated in February of 1994, the project will provide non-traditional exporters with a maximum loan amount equivalent to US\$500,000 to strengthen their financial base. An export finance office has been set up at the Bank of Ghana to manage the financial schemes under the project. Under the project, the Bank of Ghana, in collaboration with the Ghana Export Promotion Council (GEPC) will provide specialised training for new and existing non-traditional exporters.

### **BOX 2 BOOST FOR EXPORTERS**

Disbursement of the US\$51 million fund established to promote non-traditional exports and improve the efficiency of the private sector has begun in earnest with the granting of loans to four companies.

The companies, dealers in pineapples, wood products, sheanuts and palm-kernel cake have benefited from loan facilities ranging from \$17,000 to \$300,000 to enable them to satisfy their exports. The fund known as the Private Enterprise and Export Development (PEED) Project, being undertaken by the Ghana Government in collaboration with the International Development Association of the World Bank, became effective in December, 1993.

The Director of the PEED Project said that \$34 million out of the amount has been earmarked strictly for the non-traditional sector to boost exports so as to double earnings within the five year project period.

Daily Graphic 18/10/94

### **B.2.4 Disincentives to NTAEs**

Over the years, the GEPC has reviewed its policies and programmes to better facilitate and promote NTAEs. Though the past few years have seen major simplifications in the exporting process, exporters continue to face a number of problems. For example, the steps exporters are required to follow vary -- sometimes significantly -- according to the product. This is a source of confusion and duplication of efforts for those who export more than one product. In addition, the administrative procedures change frequently, particularly with respect to foreign exchange controls.

Obtaining the necessary export permits is a particular source of inconvenience and frustration. Many exporters complain of the cumbersome bureaucratic procedures involved and the uncooperative attitude of some of the officials responsible for issuing these permits. Apart from the costs involved in obtaining them, many exporters end up losing orders as a result of delays.

Depending on what one is exporting, permits/certificates must be sought from the following governmental bodies.

1. Logs, lumber, and wood products: export permits are obtained from Forest Products Inspection Bureau (FPIB).
2. Handicrafts and Antiques: export permits are obtained from Ghana Museum and Monuments Board (GMMB). If the items are made from animal parts, a permit must be obtained from the Department of Game and Wildlife.
3. Foodstuff, plants, and seeds: exporters obtain phytosanitary certificate from the Plant Protection and Regulatory Service of the Ministry of Food and Agriculture.
4. Fish and Fish Preparations: exporters obtain certificate from the Fisheries Department of the Ministry of Food and Agriculture.
5. Animals and Pests: permits are obtained from the Game and Wildlife Department.

#### **B.2.5 Institutional Back-Up Services to NTAE Producers**

The GEPC has initiated a novel programme aimed at harnessing and tapping the uncoordinated supply source of rural export-oriented production activities. The programme is designed to provide a mechanism whereby the multitude of small rural producers can first be organised into export production village (EPV) companies that are owned and managed by producer shareholders, and then linked with exporters with existing or potential markets for their products.

The objectives of the EPV Company programme are to:

1. Develop an effective institutional mechanism for the planning and coordination of rural-based export production and marketing;
2. Create regular and guaranteed markets for rural export production;
3. Ensure the availability of supplies for sustaining export markets;
4. Develop, improve, and sustain entrepreneurship, production efficiency, and quality consciousness among rural producers, and;

5. Create or enhance employment and income opportunities in rural areas, thereby improving the standard of living of the rural producers.

These Export Production Village Companies are given special incentives by GEPC in the form of:

1. Sponsorship
2. Equity participation not exceeding a sum equivalent to the share capital raised by the GEPC
3. Assistance in sourcing production inputs and credit
4. Assistance in the organisation of land clearing and development activities
5. Extension services

Under the guidelines of the EPV Company Programme, an EPV may be established to undertake activities in the following sectors:

- |                  |   |   |
|------------------|---|---|
| 1. Vegetables    | - | Mushrooms   |
| 2. Fruits        | - | Pineapples, avocados, pawpaws, bananas, coconuts  |
| 3. Staples       | - | Yams, cassavas, plantains   |
| 4. Spices        | - | Black pepper, chillies, ginger  |
| 5. Tree crops    | - | Rubber, cola nuts, cashew nuts  |
| 6. Aquaculture   | - | Shrimp farming  |
| 7. Manufacturing | - | Coconut fibre products, Processed cashew nuts, salt                                     |
| 8. Handicrafts   | - | Batiks, straw baskets, rattan furniture, handloom textiles, wooden items, jewelry, etc. |

Of the ten projected export production villages, seven are already in operation. These are located: at Awutu Jaako in the Central Region and Amanten in Brong Ahafo Region for the cultivation of yams for export; at Sampa, also in Brong Ahafo Region, for cashew nut production; at Sefwi Bekwai in Western Region for black pepper; at Bolgatanga in the Upper East Region for straw basket production; and at Aburi in the Eastern

Region for woodcraft production. Closely related is an artisanal fisheries project being carried out in the Central Region in conjunction with the Central Regional Development Commission (CEDECOM)).

The three GEPC companies that have yet to be established are in the Volta Region for the production of yams; at Bamboi in the Northern Region for chili pepper production; and at Bonwire in the Ashanti Region for the production of Kente; and in the Upper West Region for cashew nut production.

### C. PRACTICES: PRODUCTION CHARACTERISTICS OF THE MAJOR NTAE PRODUCTS

To adequately understand the full range of environmental and socio-economic effects that the promotion of NTAEs is having upon the natural and human resource base of Ghana, it is first necessary to understand prevailing production methods. The following discussion details those methods for Ghana's three leading NTAEs, pineapples, yams, and kola nuts, by focussing in on the practices of three leading production communities: the village of Kuntuse in Nsawam District (pineapples); the town of Atebubu in Atebubu District (yams); and the village of Kwahu Praso in Kwahu South District (kola nuts.)

Field research was carried out in 1994 by a multidisciplinary team of six researchers made up of an Agriculturist, Economist, Sociologist, Development Planner, Forester, and Agriculture Extension Officer. The team spent about three weeks in each of the three centres. Participatory Rural Appraisal (PRA) methodology was employed with a few structured questionnaires to facilitate discussion. Local traditional/community leaders, opinion leaders, and stakeholders were given the opportunity to participate in the discussions at various durbars which were arranged during the field studies.

During the studies, all the major actors and operators were interviewed (ie. farmers, transporters, labourers, and landowners) and their activities, practises and concerns were analysed.

Though the results of these studies should not be extrapolated to represent production practices

nationwide, the fact that these three communities are among the highest producing areas for their respective NTAE crops does suggest that the ecological and sociological problems they are encountering are likely to be experienced by other export producing areas -- if not already, then sometime in the near future. Indeed, it was for this very reason that these three communities were selected.

#### C.1 PINEAPPLES (*Ananas comosus*)

Today, pineapples are the leading NTAE crop in Ghana, accounting for 10% of all NTAE exports. The main variety is Smooth Cayenne, and the favoured areas are the hills of the middle Densu Basin, the Akwapim highlands, and other areas in the Greater Accra Region.

The major pineapple producing area is the Nsawam District where a combination of physical, infrastructural, political, and socio-economic conditions stimulate and promote cultivation. Most importantly, Nsawam has the requisite climate. Temperatures range between 21°C to 32°C, and annual rainfall, which falls in two distinct seasons, varies between 700 mm. and 1,300 mm. The major rainy season lasts from May to August while the minor one goes from October to December.

Nsawam's high production levels are made possible by the dark and grey loamy soils which predominate. The savannahs and forest ochrosols which are very suitable occur within the plains along the slopes of the hill ranges and tertiary sands. The soils are deep red, well-drained and medium textured, and very responsive to fertilization.

Pineapple production was first introduced to Nsawam in the late 1930s, primarily in response to declines in the cocoa industry. At first, cultivation was on a limited scale and was concentrated along the slopes of mountain ranges. Peasant farmers planted pineapples and citrus crops as part of a mixed cropping system.

When thousands of cocoa trees were cut down as a result of an outbreak of swollen shoot disease in the 1960s, the dense forest vegetation was converted into a derived savannah vegetation. This facilitated further clearance and set up the prospects for widespread pineapple cultivation, especially in the northern part of the district.

Government policies promoting the diversification of exports, especially the emphasis on NTAEs contained in the 1984 Economic Recovery Programme (ERP), served to stimulate pineapple production. It was then that Nsawam's proximity to the greater Accra area came into play. Like many perishable crops intended for distant markets, pineapples must be picked long before they are ripe. Profitability depends upon how quickly they can be transported from where they are produced to where they are ultimately consumed, which in Ghana's case generally means Europe. Nsawam is linked to Accra by a 35-kilometre highway, thus allowing for fast and low-cost transportation to the international airport and the harbour at Tema.

### C.1.1 Land Acquisition

In Nsawam District, as in the rest of Ghana, most land is still communally owned. Actual ownership is vested in a land-owning group which can either be a family or a clan. Individual members of the group have access rights to any part of the communally-owned land, unless that land has already been allocated. Any land so acquired cannot be sold without the consent of all the members of the land-owning group. Land can also be granted to a "stranger" (one who does not belong to any of the clans or families) under an *abusa* agreement, a traditional share-cropping arrangement whereby a third of the production goes to the landlord.

In recent years, however, the needs of commercial production have led to drastic changes in the communal system of ownership. The extensive care and constant maintenance required in pineapple production places a premium on individual control of the land. As a result, long-term leases (50 to 80 years) and outright sales have become increasingly common. Although an estimated 50-80 percent of the pineapples exported from Ghana are still produced by smallholders, export liberalisation policies launched under the ERP have resulted in traditional small-scale farmers being displaced by large-scale producers. This is evidenced by the fact that all but two of the large-scale farms in the Nsawam district were established after 1984.

Of the 30 pineapple farmers in Kuntuse village, 12 of them (40%) obtained their lands through leasehold arrangements. It must be pointed out that most of the farmers in this category are immigrants who are producing pineapples for export. Of the nine producers

who are operating on family lands, four claimed they had leased some part of their land to other small-scale producers on a cash tenancy agreement. Five of the interviewees acquired their land through inheritance, while three of them (all large-scale exporters) acquired it through outright purchase. The last farmer received his land as a gift from a friend.

The size of the farms being cultivated ranged from 0.5 to over 32 hectares. Average output is 30,000 kilogrammes per hectare. Even though large-scale, mechanised farming is on the increase, most of the production continues to come at the hands of peasants farmers.

?  
per year  
of crop?

### C.1.2 Labour Input

Commercial pineapple farming offers employment opportunities to local villagers. Generally speaking, there is a sufficient supply of labour in the Nsawam area. Shortages do occur, however, during the land preparation period that lasts from January to April because that coincides with cassava harvesting and maize sowing on family plots. Small-scale producers must rely solely on their own families' labour during this four-month period.

Labour sources can be classified into three main types; family, hired local labour, and hired migrant labour, which includes those with special skills or knowledge. In Kuntuse, 54% of the labour at the pineapple farms is performed by hired local sources, 36% is performed by migrants, and the remaining 10% by the farmer's family. Thirty percent of the farmers rely on their extended families for labour.

### C.1.3 Land Preparation and Planting

Even though traditional small-scale farming is increasingly giving way to large-scale commercial farming, farming methods have not undergone any major transformation. The small-scale farmers who account for about 77 percent of the pineapple producers in the Nsawam area, still use slash-and-burn techniques in preparing the land for cultivation. They are unable to switch to the modern methods employed by the few large-scale farmers due to financial constraints.

Of the 23% of the farmers who employ modern machinery to prepare their land, most use bulldozers or tractors. These large-scale farmers also use herbicides

to clear the land and control weeds. Ploughing and harrowing are sometimes undertaken to facilitate planting.

Three types of planting methods are used in the Nsawam area by both the small-scale and large-scale farmers: suckers, crowns, and slips. Suckers are preferred in that they produce their first crops sooner, usually between 15 and 18 months after planting as opposed to crowns and slips which mature between 18 to 24 months. They are also more resistant to drought. They are, however, substantially more expensive and sometimes difficult to obtain.

Kuntuse's seven large-scale farmers plant roughly 20,000 suckers per hectare, and adhere to relevant spacing requirements: 30 cm. between plants and 100 cm. between beds. Most of the local peasant farmers, however, plant considerably less than 20,000 suckers and not in rows.

Before the introduction of the SAP and the advent of large-scale pineapple farms, the small-scale farmers did not use any agro-chemicals at all. Given the chemical-intensive nature of export pineapple production, almost all the farmers in the Nsawam area currently use a variety of pesticides, weedicides, and chemical fertilizers. Despite the increasing use of numerous agro-chemicals in all phases of production, however, extension officers are seldom consulted.

Usually a balanced fertilizer containing Nitrogen-Phosphate-Potassium (NPK) is applied either just before planting or 4-6 weeks after planting. Because mealy bug wilt can spread rapidly, some farmers treat suckers with a systemic insecticide such as Dimethoate, Rixion, Perfection, Dimeton methyl, or Phosphomidon before planting. Ammonium Sulphate or Urea and Potassium fertilizers are also applied at specified times after planting.

Pineapples can not tolerate weeds. Most of the farmers use underground stolans or rhizomes such as systematic insecticides, e.g., Dimethoate, Rixion, Perfection, Dimanton methylagen. Phytophthora (heart/root) rot is controlled by using Hetalaxil or Aluminium ethyl phosphite. Base rot can be treated in similar fashion or with Captafol. Re-cropped land may be infested with nematodes, which are sometimes controlled with nematicides.

Calcium Carbide is frequently applied to force fruiting. Many farmers add a small quantity of kerosine or Ethrel

plus urea to get better results. A full 70% of the farmers treat their crops with ethylene prior to harvest to ensure ripening and good coloration. Fruit is harvested with the stalk trimmed and treated with a solution of Benomyl (Benlate), Thiabendazole, or fungsil Benlate mixture immediately before packing to control watery heart or black rot.

#### C.1.4 Production Costs and Returns

The main costs in the production of pineapples are land acquisition, land preparation, agricultural inputs, and equipment. Most of the farmers are now using bulldozers for clearing the land. Other input costs include suckers, weedicides, and pesticides. Equipment costs also include items like knapsack sprayers, Wellington boots, and protective gloves. Generally speaking, these costs add up to about C896,200 per hectare of land over the 18-month production cycle, not including management and other miscellaneous expenses.

On average, 30,000 kilograms of pineapple are harvested per hectare. At the basic farm gate price of C35 per kilo, the total return per hectare is thus approximately C1,050,000. Gross profits (total returns less production cost) are thus C153,800 per hectare, with total returns reflecting managerial and miscellaneous expenses. Given the prevalence of spoilage, theft, and the effects of adverse weather, however, what ends up being sold is generally much less than the average harvest. It is estimated that on average only half of the total yield is of exportable quality.

#### C.1.5 Marketing of Pineapples

Importers usually prefer half-ripe to ripe fruit, but there is variation in the preferred color. As there are no international grading standards, Côte d'Ivoire standards are generally applied. Pineapples are normally packed by size, appropriately labelled, and transported by air or sea.

There are six main channels through which pineapples are marketed in the Nsawam area: local assemblers, urban wholesalers, local retailers, urban retailers, factory processors, and exporting agents.

##### i) Local Assembler

Local assemblers are traders who are residents or who have spent most of their time in Nsawam. They are not

growers themselves, but they locate farmers and buy from them. They then send the accumulated pineapples to the periodic local markets.

ii) Urban Wholesaler

These are traders who come from urban centres, especially Accra. They buy the fruits from anybody they can, but particularly from the farmers and local assemblers who serve as their agents. They then deliver the fruits to retailers in the urban centres.

iii) Local Retailer

For the most part, these are traders who sell along roadsides. They buy directly from the farmers.

iv) Urban Retailer

This group is comprised of small-scale traders who buy at the periodic urban markets. They, in turn, send the pineapples to other urban outlets according to market day schedules.

v) Exporting Agents

These are individuals who actually export pineapples. They buy directly from the farmers who grow for export, especially the large-scale producers.

vi) Factory Processors

These people represent the pineapple processing industries (e.g., Astek and Nsawam Cannery) located in Nsawam. They buy directly from the farmers. Occasionally, when there are shortages, they will also go to local assemblers.

Marketing at the farm gate is primarily done between the farmer and either local assemblers, urban wholesalers, local retailers, exporting agents, or factory processors. All these buyers generally bring their own vehicles so that they can take their purchases away with them.

Sometimes the farmers transport their pineapples to the open market themselves -- either by road or rail. At Nsawam, even though the market operates on all days, Tuesdays and Thursdays are especially busy. Activities start early in the morning when traders arrive from Accra, Tema, Koforidua, and other urban areas. When the trading dies down around 3 p.m., the farmers take

the remaining stock back to their homes or reduce the prices for quick sale.

Whereas at the open market, pricing is based on size and ripeness, processing industries buy on the basis of acidity and sugar content tests. If the quality is good the farmer is paid C35 per fruit (in 1993). However if the acid content of the fruit is "unacceptable" they only receive between 12 and 20 cedis per fruit.

As wholesale prices continue to increase overall, most farmers prefer to sell their crop to exporters who not only tend to offer higher prices than the processing industries, but also generally make payment at the point of delivery.

### C.1.6 Impacts

Pineapple production is on the increase in both Nsawam and the other producing areas in the vicinity of Accra. Overall, the number of pineapple farmers has nearly doubled over the past several years. This is due to the increased demand from exporters. A remarkable increase in total output has led to substantial improvements in household earnings.

A major constraint for increasing production is the shortage of available capital to purchase suckers and agro-chemical inputs. Few small farmers have the capital (or access to credit) to purchase all or sufficient chemical inputs; many pineapples are not of export quality and losses to pests and diseases can be high. Outgrowers rely on their buyers to force and artificially ripen the fruit.

Another problem with pineapple production is that market gluts at certain times of the year reduce prices and saturate the exporting avenues. These gluts are attributed to the dependency on rainfed production, and constraints of storage, processing, marketing, and transportation. Soil erosion and the heavy use of agro-chemicals also pose serious environmental and health problems discussed later in this report.

### C.2 YAMS

Total yam production has been increasing in Ghana. In 1992, 143 exporters earned roughly US\$2.1 million by exporting 2,728 tons of yams. A year later, the number of exporters dropped to 112 though the quantity of yams exported increased to 3,574 tons. As a result of lower producer prices, however, the 1993 exports earned only US\$2.0 million.

Six species of yams are grown in Ghana, but white (or Guinea) yams (*Dioscorea rotundata*) predominate both in local consumption and the export trade. The "Puna" and "Laborkor" varieties are the most popular by virtue of their taste and palatability, and thus constitute the bulk of exports. The main markets are Europe and North America. The other five species are produced on a subsistence basis for local consumption. Of these, the most prominent are the yellow yam (*Dioscorea caynensis*) and the water yam (*Dioscorea alata*). All of the 15 main centres of yam production in Ghana are located either in the transitional or forest zone.

### C.2.1 Production Process

Yams are generally planted between August and January, just before the end of the main growing season. For the most part, yams are propagated by tuber sections/cuttings. Like other seed tubers, yams require a period of dormancy before they are planted or else the percentage sprouting is greatly reduced. Therefore, seed yams are stored for about two months before being planted. Though they are susceptible to bacteria, fungi, insects, and rodents, the cuttings are rarely treated with a pesticide.

Most planting occurs in accordance with traditional systems of shifting cultivation, though many farmers now use tractors to clear the land. Preparing the land starts before the coming of the fall rains. The land is cleared and the trees felled. When the debris has dried sufficiently, it is burned and the ashes are mixed into the soil. A series of mounds, roughly 1.8 meters apart, are then made with hoes by drawing the top soil together. Between 20,000-30,000 stem sector/cutting are planted per acre. Chemical fertilizers are rarely used.

As good yields can only come from staking, once the vines begin to grow, they are tied around poles. The farmers of Atebubu insist that the poles must be at least 1.83 metres high. In the savannah and transitional zones, however, good staking materials are not readily available. The premature cutting of trees and other wood plants to stake the yams is one of the major causes of land degradation and soil erosion in the savannah zones.

Harvesting is done once a year in accordance with local conditions, but almost always sometime between June and August. There can be as many as three tubers in each mound, but most mounds yield only a single yam. Harvesting is very laborious and one of the most

delicate of all farming operations as cuts or bruises increase the likelihood of attack by microorganisms, including nematodes, which can cause rot. A sharp stick is used to dig the yams out of their mounds. Family labour is generally relied upon as hired labourers are more likely to damage the yams through carelessness.

### C.2.2 Marketing

Yams are normally bought at the farms and transported to the nearest village by middlemen. These middlemen (who are mostly women) are predominantly illiterate local people who have learned the business from on-the-job training. Among the middlemen are wholesalers, retailers, and marketing agents.

There are two kinds of wholesalers, the local wholesaler who buy the yams from the individual farmers and bring them to the rural centres, and the visiting wholesalers who travel to the rural centres on market days, buy yams from the local wholesalers, and then transport them to the urban centres such as Accra and Kumasi. Both men and women work as wholesalers. At Atebubu, these two groups of wholesalers have formed an association called The Yam Sellers Association. Currently, there are about 160 members, 80% of whom are women.

Some of the local wholesalers do not go to the various farms themselves, but hire marketing agents to perform this task for them. Sometimes, the wholesaler will provide the marketing agent with a bicycle so that he can go around to all the villages and identify farmers who are ready to harvest their yams. If the marketing agent locates a farmer who is ready to sell, the agent negotiates with the farmer and sends the information on to the wholesaler who then comes with the money. The fee charged by the marketing agent is about C500 for every 100 tubers of yam they arrange.

### C.2.3 Assembling, Sorting, and Grading

Twice a week, yams are sent from the villages and hamlets around Atebubu to the local market. About 95 percent of the yams are conveyed there by the local wholesalers. It is at Atebubu that most of the urban wholesalers buy their stock.

At the local market, the yams are graded and grouped according to their size and variety. This facilitates pricing, transportation, and storage. Large yams normally weigh about 2.7 kilos, medium ones 2.0 kilos, and the small ones 1.4 kilos. All yams are sold in units

of one hundred. There are no standard criteria for grading yams, so the framers and wholesalers rely upon their experience. Standards are maintained by the competitiveness of the market: if one wholesaler's grading standards were appreciably below those of the others, he would have difficulty attracting customers who move freely throughout the market, inspecting before buying.

#### **C.2.4 Storage**

Yams must be stored since production is seasonal while consumption is spread throughout the year. A number of practical difficulties are encountered during the storage process. Dehydration leads to a loss in weight and an impairment in quality, while bacterial infection (especially from cuts incurred during harvesting) leads to spoilage. Because of these dangers, farmers try to harvest their yams only when they are needed.

When yams must be stored, it is usually done at the farm. The methods used are geared primarily towards minimising dehydration. One of the more popular ways is to keep them in a covered pit. Yams stored in this way will survive for two months before they start to germinate and spoil. At Atebubu, the middlemen store their yams in an open area, covering them with yam vines until they are sold. Chemicals are not used.

#### **C.2.5 Transportation**

Transporting the yams to market is one of the key functions performed by the yam wholesalers. Moving the yams from the farms to the rural centers can be quite difficult. The farms are scattered and many of them are very far from the main and feeder roads. Where good roads lead to the farms, trucks go to the farms to collect the yams and convey them to the urban centres. But poor road conditions prevent the use of trucks, and tractors become the primary means of transportation.

In some cases, the tractors are able to maneuver through the bush paths and get quite close to the farms. But where this is not possible, the yams have to be head-loaded to the tractors. The number of tubers that a person can carry at a time is a function of many factors including the distance that has to be traveled, the size of the tubers, and the physical strength of the person.

The charges for the use of the tractors depends on the distances to the farms and the condition of the roads. Making matters worse, is a shortage of tractors that incites competition. On average, it takes the average

farmer a week to get a tractor to cart his yams from the farm to the local rural centre.

Transportation charges vary, but are generally levied on the basis of the distance travelled and assessed on a per 100 tubers rate. Generally speaking, the longer the distance, the lower the rate. Total costs are around C20,000 for distances of less than six kilometers and C30,000 for distances in the neighbourhood of 24 kilometers.

The existing system of transporting yams from the farms to the rural centres is far from efficient. The shortage of transportation equipment and the lack of adequate feeder and farm roads (which cause the tractors to get stuck on the untarred roads during the rainy season) prevent the yams from being moved quickly and cheaply. They also contribute to unnecessary crop damage.

Transportation from the rural centres to urban centres is largely by road. Big trucks weighing five and seven tons transport the yams to the urban centres. The number of yams that can be carried by a seven-ton truck naturally depends upon the size of the yams, but generally ranges between 2,000 and 3,000.

#### **C.2.6 Financing Of Marketing**

Yam traders are able to receive credit facilities from the Agricultural Development Bank (ADB) which was established in Atebubu in March 1975. Under the ADB credit scheme, small farmers growing specific crops are organised into groups which elect their own executives. When the bank is satisfied with the constitution of the group, it gives out loans ranging from C200 to C1,000 to each of the members. The loans are payable in 18 months and the interest rate is 8½%.

If all the members in a group are able to pay their loans by the end of the 18-month period, they automatically qualify for loans for the next season. If they are unable to pay and the bank is convinced that it was through no fault of theirs (e.g., crop failure) they are not penalised, but are given additional loans to operate their farms. If, however, the group members are not able to provide any satisfactory reasons for not being able to pay their loans on time, they are denied further loans until they settle their debts in full.

Most of the yam traders near Atebubu, however, do not approach the ADB for loans: 80% of those interviewed were financing their own operations from the capital

they had slowly accumulated over the years through trading on the retail market where the quantity handled is small and the capital requirement is low. Another reason why most of them prefer not to deal with the bank is because they do not often get the money when they need it due to processing delays.

When these farmers run into financial problems, they are helped out by their fellow wholesalers, friends, and relatives. The loans they receive from these sources are generally interest free, but when they are repaid, they are generally accompanied by gifts.

Not a single one of the wholesalers interviewed stated that they had received any loans from private money lenders. The high interest rate charged by the money lenders discourages the wholesalers from going to them, even in times of need.

### C.2.7 Distribution of Return

The returns from the sale of yams in the wholesale market are divided between the farmers, the local wholesalers, the marketing agents, those who provide transportation, the local council tax, and those who provide storage facilities. (See Tables 4, 5, and 6)

**Table 4: Analysis of Marketing Margins for Small Sized Yams**

Function/Item	Charge/100 Tubers	% of Wholesale Price
Wholesale Price	C70.00	-
Producer Price	C50.00	71.4
Agent Commission	C0.40	0.57
Transportation	C14.29	14.29
Unloading	C0.40	0.57
Storage	C0.40	0.57
Local Council Tax	C1.00	1.43
Wholesaler's Profit	C7.80	11.14

Source: Survey Data

**Table 5: Analysis of Marketing Margins for Medium Sized Yams**

Function/Item	Charge/100 Tubers	% of Wholesale Price
Wholesale Price	C90.00	-
Producer Price	C70.00	77.78%
Commission to Agents	C0.40	0.44%
Transportation	C10.00	11.11%
Unloading	C0.40	0.44%
Storage	C0.40	0.44%
Local Council Tax	C1.00	1.11%
Wholesaler's Profit	C7.80	8.68%

Source: Data from Study

**Table 6: Analysis of Marketing Margins for Large Sized Yams**

Function/Item	Charge/100 Tubers	% of Wholesale Price
Wholesale Price	C120.00	-
Producer Price	C90.00	75.0%
Commission to Agents	C0.40	0.33%
Transportation	C10.00	8.33%
Unloading	C0.40	0.33%
Storage	C0.40	0.33%
Local Council Tax	C1.00	1.18%
Wholesaler's Profit	C17.80	14.83%

Source: Data from Study

An analysis of the prices paid by visiting wholesalers from urban areas reveals that farmers receive about 72% of the wholesale price for small-sized yams, 78% for medium-sized yams, and 75% for the large yams. The farmer would have received the highest percentage for large yams, but the difference between the wholesale price and the farm-gate price (producer price) is greater for large yams than it is for the other two categories. For small and medium-sized yams, the difference is about C20 per yam; for large-sized yams, it is closer to C30.

Since marketing charges are fixed, their percentage of the wholesale price is reduced as the size of the yam increases. Thus, as the price of the yams increases (because of their size) the percentage of the wholesale price that market charges comprise is reduced. The same applies to the percentage return to the local council from taxes. As a result of these fixed charges, wholesalers make more per 100 tubers from the large-sized yams: a minimum of 15% of the wholesale price as opposed to a minimum of 8.4% for medium-sized yams and 11% for the small-sized ones.

There is an inverse relationship between the transportation charge and the share of the wholesale price that goes to the local wholesaler. The higher the transportation charge, the lower his share and vice versa.

### C.3 KOLA NUTS

Kola trees grow naturally in Ghana's closed-canopy forest. The nuts are popular among the Muslim populations in northern Ghana and the countries extending to the Sahara. It is believed that long before the first Europeans set foot in Ghana, kola nuts were

being traded internationally -- in this case, by being transported overland to the savannah countries of West Africa and across the Sahara to the Mediterranean.

Though kola trees are indigenous to the entire forest zone, they grow most densely in the central and northern parts of the zone where annual rainfall averages between 1,300 and 1,400 millimetres. The area of highest production occurs in Ashanti, parts of Brong Ahafo, and the Eastern and Central Regions.

At least three species of kola are found in Ghana: *Cola nitida*, *Cola acuminata*, and *Cola verticillata*. Of these, *Cola nitida*, generally known as White Cola dominates the popular trade. Even within the species, there are several varieties. Differences lie in the colour of the nuts, the size of the seeds, and the colour of the flowers. The nuts can be either red, white, or pink, but it is the red nut that is favoured for export and hence the most commonly produced.)

#### C.3.1 Production Process

Since kola is indigenous, there are generally trees already growing when a commercial farms is established. Kola is easily propagated from fresh nuts, and old trees are generally replaced by those grown from their own seeds. As a result, kola production is often as much the work of nature as it is of man, and large plantations of kola trees have yet to be established. The land is cleared using simple farm tools such as cutlasses, felling axes, mattocks, and hoes at the end of the wet season (late December and early January) to allow for burning. Kola is usually interplanted with foodcrops and is sometimes planted together with cocoa.

In order to facilitate early germination, the tip of the nut is usually cut before planting. Germination is slow, taking between 7 and 11 weeks. As shooting seedlings are often destroyed by termites and crickets, many farmers rely upon pesticides. The plant thrives best in the shade, and with the exception of occasional brushing around the trees and the removal of climbers and epiphytes, little in the way of cultivation is given or needed. The first fruits are normally produced within six to eight years, and by the twelfth to fifteenth year, the tree yields a fair crop. From the age of twenty onward, the tree is considered to be in full production. It may continue to bear until it is seventy to a hundred years old.

Kola production is believed to have started in earnest in the 1870s when the then British colony of the Gold Coast began sending kola nuts back to the United Kingdom. As a way of increasing production, the British established a botanical garden in Aburi where kola, along with some other crops, were subjected to experimentation. In 1908, the Germans established a promising plantation in Kpandu and Ho in the Volta Region. The success of that venture encouraged many farmers to plant kola trees, especially in Ashanti, Eastern Region, and other areas within the high forest zone.

In 1924, kola exports peaked at 7,773 tonnes. From 1928 onwards, guaranteed and attractive cocoa prices led to the spread of cocoa production at the expense of kola. Most kola farms were interplanted with cocoa and when the kola trees died, they were replaced with cocoa trees.

Kola started regaining prominence after the Second World War when the price began to rise relative to cocoa. In 1970 when the producer price of 62.5 kilos of cocoa was C18.40, the same quantity of kola nuts was yielding C54.00. This nearly threefold discrepancy, combined with the general instability of the cocoa business, induced many farmers to shift to kola. Continued falling cocoa prices only caused that trend to continue. As a result, many traditional cocoa producing areas were converted to kola production. The village of Kwahu Praso, where weather and soil conditions are particularly conducive to kola production, was one such area. It is now Ghana's leading producer of kola nuts.

### C.3.2 Harvesting

There are two main harvesting seasons. The major season, locally known as *Abiribira*, begins in October and gradually increases to a peak in December. By March, the main crop has been harvested in most areas, but a smaller, mid-season crop is then ready in late May and June. This minor season is called *Awia Bese* (Sunny kola).

Harvesting involves gathering the fallen nuts or plucking them with a cutlass or hooked knife fixed to a long pole. This work, which is tedious and frequently performed with the assistance of a ladder, is generally done by men, while women and children gather the plucked nuts.

After they have been gathered, the pods are cracked open to remove the nuts which are covered by a white, pulpy coating. In some cases the nuts are sold in this condition, but generally they are heaped in small piles under the trees and covered with plantain leaves for about seven days so that they can ferment. The white coating is removed and the nuts are checked for weevil damage. The nuts are then stored in baskets, normally made from raphia palm, which are lined with leaves.

The nuts are preserved for about three months to await demand. One method of preservation is to spread a layer of kola nuts under a 25 centimetre layer of soil. Under dry conditions, the nuts can be stored for up to three months this way. The only problem with this method is that too much moisture in the soil may cause the nuts to germinate. Farmers may also preserve the kola nuts by removing the greenshell cover, burying them in a six-by-four meter pit, and then covering them with leaves. Every two weeks, the farmer uncovers the nuts and removes those that have germinated.

### C.3.3 Diseases and Production Problems

The kola tree is normally attacked by the same fungi (*Fomes lingnosus* and *Fomes noxius*) (Root rots) which attack cocoa and other forest trees. The kola fruit fly (*Ceratitis colae*) is reported to cause the nuts to open prematurely, which allows for infestation by the kola weevil (*Balanogastriis kolae*). Damage by the kola weevil has yet to be accurately determined, but it is considered to be the major cause of crop loss.

#### **C.3.4. Marketing**

In the early days of the kola trade, nuts were head-loaded by Ashanti farmers to staging posts in northern Ashanti astride the Hausa (of Northern Nigeria) trade routes. From there, they were generally sold to buyers from the north though these buyers occasionally journeyed to the producing areas to buy the nuts directly from the growers. For centuries, kola nuts constituted Ghana's leading agricultural export commodity. Today, they are among the most valuable of exports to the interior of West Africa.

The introduction of motor transport and the construction of a railway from Accra to Kumasi led to the expansion of the kola farms and trading. It also led to the diversion of traditional trade routes. Nuts now began to be transported southward to the coast where they were shipped by sea.

The principal constraint to increasing export volume and value are formal markets. The trade has for the most part been informal, although the government is attempting to formalize the effort -- especially with Nigeria -- to generate much needed foreign exchange. Recently, quantities of dry nuts have also been exported by sea to Europe and North America to service the growing African and Caribbean communities.

#### **C.3.5 Socio-Economic Impacts**

Kola production is the major source of income in Kwahu Praso area and it affects the socio-economic life of the people more than any other activity. Of the 100 kola farmers in Kwahu Praso, 70 are male and 30 are female. Only 20 of them have had any formal education; the rest are illiterate. As a body, they are disinclined to adopt new ideas. Most of them, for example, have never used fertilizers.

In general, the female farmers are younger than their male counterparts: 63.3% of the female farmers are between the ages of 30-34 as compared to 37.1% of the males. Nearly half of the male farmers (47.1%) are between 50 and 59 years whereas only a quarter (26.7%) of the females are. Since most of the farmers are rather old, maintenance (periodic weeding and pruning) tends to be very unsatisfactory. This affects production and jeopardizes the sustainability of the kola farm.

Slightly more than half (55%) of the farmers in Kwahu Praso acquired their farms through their own efforts. The rest, inherited their lands according to traditional matrilineal practices.

Kola nut production employs about 80% of the villagers. It also provides employment to immigrant farmers, most of whom are engaged in harvesting, weeding, and marketing the nuts for export.

During the major harvesting season, most of the farmers who are civil and public servants obtain leave from their work in the cities and towns to return home and engage in the lucrative kola nut trade. During school holidays, most students also return home to help out. Some of the students even use the income from the kola business to finance their education. It is also through the kola business that many farmers have been able to educate their children, even at the university level.

#### **C.3.6 Market Returns**

Kola continues to dominate the economy of Kwahu Praso despite recent increases in the producer price for cocoa and the government's efforts to rehabilitate cocoa production by hiking producer prices. Out of the total C17,969,000 accrued from the sale of both cocoa and kola in 1989, a full three-quarters came from kola. The reasons for this are based in simple economics: production per hectare of kola is far greater than cocoa, and hence, so is the income earned. That year, kola production yielded an average of 12.5 bags per hectare while cocoa yielded only 4.8 bags. The average farmer made C135,000 from kola, three times what he or she made from cocoa (C44,690).

In 1992, kola's relative advantage had fallen somewhat: about C120,968,000 was realised from the sale of kola nuts, while cocoa earned C70,286,000, roughly three-fifths that number. The yields of both crops has decreased considerably since then as both the trees and the farmers advance in years. The next year, 8.2 bags of kola were obtained per hectare, compared to 2.9 bags of cocoa -- both of which represent declines of over 30%.

#### **C.3.7 Infrastructural Development**

In addition to improvements in household incomes, infrastructural development has been one of the major benefits of kola production. The kola farmers of Kwahu Praso have made significant contributions towards the construction of roads, bridges, the local primary school,

KVIP toilets, boreholes, and a community centre in the village. Before the introduction of kola production in the 1960s, there were no motorable roads in the area. In the 1970s, the community began constructing a series of feeder roads so that all kola farms could be linked to the village and hence to Nkawkaw, the main market centre. Twenty-two kilometres of feeder roads were built at a total cost of C160,000,000, all of which was raised through periodic individual contributions.

### **C.3.8 Kola Production and Other Cash Crops Especially Cocoa**

Cocoa is the major foreign exchange earner for Ghana. Until the mid 1960's, cocoa cultivation was a source of great pride and income to the farmers of Kwahu Praso. During the 1960s and '70s, changes in market prices in favour of kola induced farmers to shift resources from the cultivation of cocoa to kola production. Since then, the production of other crops has also declined significantly.

After 1983, however, cocoa production started to become more attractive, especially in light of government-sponsored schemes. Notwithstanding this, the production of kola nuts in Kwahu Praso has kept increasing. (see Table 7)

**Table 7: Production of Cocoa and Kola nuts by 100 farmers in Kwahu Praso from 1989 - 1993**

	Cocoa (Bags)	Kola Nut (Bags)
1989	1,200	980
1990	730	1,200
1991	450	1,620
1992	370	1,540
1993	410	1,600
	-----	-----
	3,160	6,900

According to the farmers themselves, the ongoing declines in cocoa production are due to:

- i) Low prices of cocoa output and delays in payment by the Ghana Cocoa Board which has a monopoly on the purchase of cocoa;
- ii) Cocoa's heightened vulnerability to disease, especially swollen shoot disease;
- iii) Per unit yields and prices that are below those of kola nuts; and
- iv) Cocoa production's heightened maintenance demands.

With the recent moves to increase and formalize export, some old cocoa farms are being uprooted and converted to the cultivation of kola trees, including the use of some hybrid varieties. It must be noted that kola cultivation has increased partly because many cocoa farmers prefer to use kola trees as shade for young cocoa trees. There are two primary reasons for this preference: one, the indiscriminate destruction of cocoa farms by timber merchants should they use other hardwood species; and two, the fact that interplanting kola with cocoa reduces the incidence of disease in the cocoa trees.

### **C.3.9 Impact of Kola production on foodcrops**

The increasing profitability of the kola trade has induced roughly 90 percent of Kwahu Praso's inhabitants to reduce the amount of time and effort they put into the cultivation of food crops. Land allocated for foodcrops production has also dwindled. This has led to periodic food shortages in the village.

Immigrants from northern Ghana as well as from the neighbouring countries have aggravated Kwahu Praso's food problem. While a "bunch" of plantains, the local staple, costs C800 in the village, the same quantity is sold for C500 in Danteng, which is only 10 kilometres distant. Acute food shortages have resulted in the rampant theft of food crops. And while the kola farmers continue to receive significant income during kola harvesting season, the cost of staples (plantain, cassava, yams) is taking an increasingly large percentage of that income.

### **C.3.10 Impact of Kola Production on Forest Ecology**

Before the large-scale production of kola began in the 1970s, about 98% of the Kwahu Praso area was covered with forests. The area was rich in timber species, especially Odum, Onyina, Sapele, and Wawa.

But the increased cultivation of kola has resulted in the destruction of most of the natural vegetation, along with its rich biodiversity. Most farmers deliberately destroy even young timber species on their farms to prevent the timber merchants from entering their kola and cocoa farms with bulldozers.

As a consequence of the deforestation, the micro climate of the area has been adversely affected. As rainfall patterns become increasingly unreliable, many areas of the village have become infertile and erosion is

rampant. The whole area is being covered by an uncontrollable weed (*Chromola odorata*) which is able to spread quickly over the infertile ground due to the easy dispersal of its seeds by the wind. Another major consequence of the destruction of the forest is that the villagers have less "bush meat" (wild animals) with which to supplement their diets.

As kola nut production increases, so too does the destruction of the available semi-deciduous forest. Kwahu Praso is only one of 25 main kola growing areas in the country. Although the 10,038 tons of kola nuts exported in 1992 earned Ghana US \$1,432,845 and the 9,973 tons exported in 1993 brought in US \$1,020,750, the cost of the negative environmental impacts might be higher than the value of the income earned.

Given the financial incentives posed by the cultivation of kola nuts and its impacts on Kwahu Praso's forests, initial efforts should be to consolidate production on old farms. It may also be necessary to encourage the farmers to adopt better maintenance practices and increase output through the use of appropriate fertilisers and pesticides, and encourage diversification on kola tree plantations by intercropping kola with cocoa and other crops to increase the production per unit of land. Diversifying the agricultural base might be important for the well-being of the national economy, but the promotion and production of the selected crops must be done on a sustainable basis.

#### D. NTAES: RESULTS TO DATE

In general, the government's promotion of NTAEs has been successful in increasing the quantity of these exports. Unfortunately, however, a number of factors have conspired to reduce the earnings of these increased exports. Some of these, such as falling world producer prices and increased competition from other producer nations, are beyond Ghana's power to control. Others, such as transportation and processing bottlenecks, confusing and delaying administrative procedures, and insufficient or inappropriate provision of agricultural inputs are within the government's control and are currently being addressed.

These remedial actions, however, are all geared toward increasing export productivity, and hence revenues. As worthy as this goal might be in terms of the overall

economic development of the country and the amelioration of the quality of life for many Ghanaians, it does not take into account many of the flaws inherent in a policy that is geared strictly towards increasing short-term outputs. Particularly susceptible to being overlooked are many adverse local-level impacts, especially those of an environmental and sociological nature.

In addition to the short, medium, and long-term detrimental effects that environmental degradation and sociological disruptions can have on the natural resource base, continued downplaying of these impacts can quite literally undermine any overall success that the NTAE sector has had to date.

In short, it is imperative that the development of NTAEs in Ghana be done in a sustainable manner. As the following discussion demonstrates, there are many reasons to believe that this is not happening.

#### D.1. NATIONAL-LEVEL IMPACTS OF THE NTAE STRATEGY

##### D.1.1 Growth and Revenue

Initial results of the government's efforts in expanding the economic base through the promotion of NTEs are encouraging. Sector earnings skyrocketed from US \$1.9 million in 1984 to \$62 million in 1990. Commercial agricultural exports, which include horticultural products, fish/seafood, game/wildlife, medicinal plants/seeds, and other agricultural products, is both the largest and the fastest-growing subsector. (see Tables 8 and 9) In 1989, the value of NTAEs was US \$21.17 million (61% of total value of NTEs). Five years later, NTAEs earned US \$26.13 million (29.5% of total NTE earnings of US \$71.7 million) an annual average increase of approximately 5 %.

Second, is horticultural products which contributed 11% of total NTE earnings in 1989. Of this subsector, pineapples are clearly the largest contributor. They have also demonstrated the most consistent gains: in 1989, 7,947 tonnes yielded earnings of US \$2.1 million; in 1990, 9,440 tonnes earned US \$3.8 million; in 1991 10,675 tonnes earned US \$5.1 million; in 1992, 9,754 tonnes had a value of US \$4.38 million; and in 1993, 13,156 tonnes earned US \$5.177 million.

Table 8:

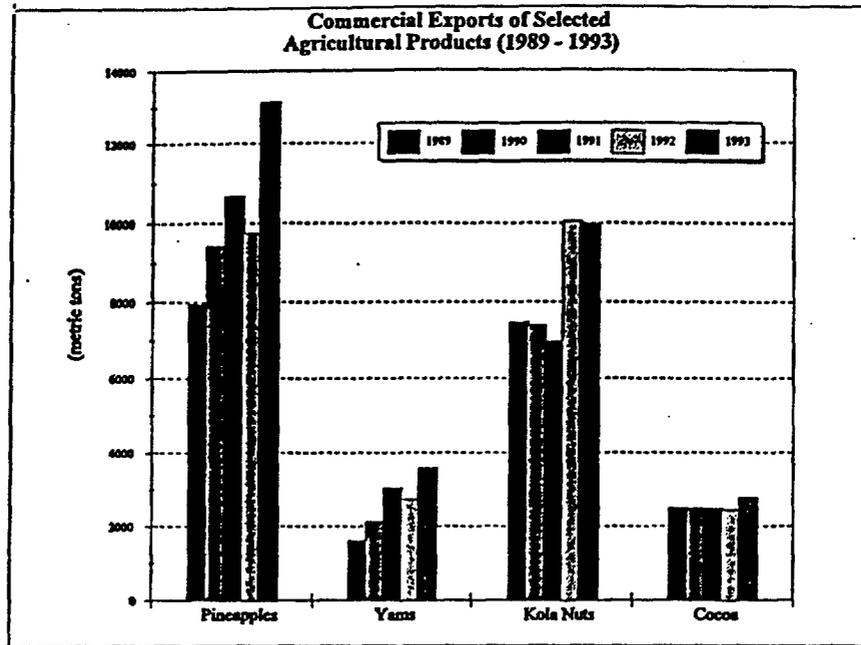
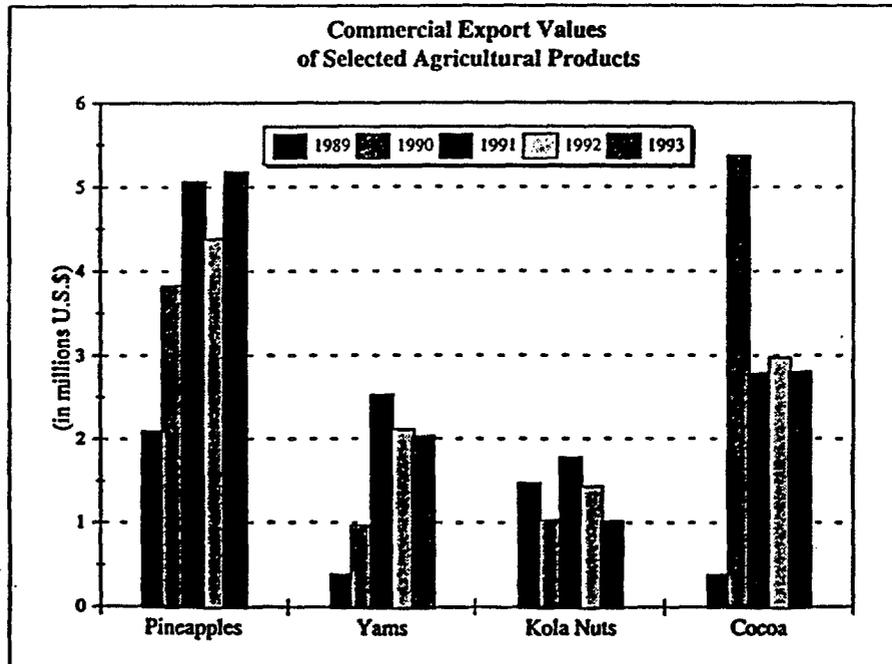


Table 9:



The primary contributor to the sub-sector's overall earnings came from the steady performance of fish and fish products, which continues to account for roughly 60% of subsector earnings. e year period, this translates into a total increase of 65% percent by quantity and nearly 150% percent by value. Although the volume of pineapple exports increased by nearly two-thirds over period from 1989-1993, Ghana has not been able to maintain its market share. Ghana's share of the U.K. market, its traditional leading market, for example, dropped from 36 percent in 1990 to 4.7 percent in 1993. The reason behind this prodigious slump is Ghanaian producers inability to compete with Latin American producers on the basis of productivity, quality, price, and marketing strategies.

Though they still account for less than half the earnings of pineapples, yam exports increased even more dramatically in both volume and earnings: from 1,635 tonnes worth US \$.39 million in 1989 to 3,574 tonnes worth US \$2.034 million in 1993. This constitutes an increase of 115 percent in quantity and nearly 500% in earnings.

During this same five-year period, kola nut exports increased 32% in volume (from 7,482 tonnes in 1989 to 9,972 tonnes in 1993), but decreased nearly the same percentage in earnings (from US \$1.48 million in 1989 to US \$1.020 million in 1993). Much of this decline can be attributed to Togo's closing of the eastern border, thus blocking traditional export routes to Nigeria.

#### D.1.2. Export Markets

Ghana's NTEs now go to more than 60 destinations, though the proportions of those products differs significantly from nation to nation. The European Union (EU) continues to be the leading destination, taking more than half (52.9 percent) of all NTEs by value. The leading EU markets are the UK, Germany, Spain, Italy, Netherlands, and Belgium, and the leading exports are pineapples, cotton seeds, rubber, fish and fish products, furniture, and scrap metal.

The second largest market is the Economic Community for West Africa (ECOWAS) which took 20.3 percent of Ghana's total exports in 1993. Those ECOWAS countries receiving the largest share of Ghanaian products are Nigeria, Burkina Faso, Togo, Côte d'Ivoire, and Niger. The major items which are exported to these countries include kola nuts, salt, Aluminium products, palm oil, yams, and smoked fish. Other

African countries which import significant amounts of NTEs from Ghana include Libya and South Africa.

Other developed countries, mainly USA, Japan, and Switzerland imported about 16.4 percent of the NTE items in 1993, while South Asia, the Middle East, and South East Asia combined for 9.0 percent.

#### D.2.

GEPC statistics indicate that the earlier growth of the NTE sector has slackened in recent years. Between 1990 and 1991 for example, NTEs grew only 0.33 percent. Even the 5% growth that was recorded between 1992 and 1993 was well below the 29 percent per annum goal set under the Medium Term Non-Traditional Export Development Plan, 1991-1995. According to that plan, NTEs were to be contributing US \$171.48 million to the Ghanaian economy by 1993. In reality, they are currently only contributing US \$110. The realised growth rates were also well below the 20 percent per annum (between 1991 and 1997) targets set under the USAID-sponsored Trade and Investment Programme (TIP). This could be due to the GEPC's failure to:

- i) create Goodwill for Ghanaian products overseas;
- ii) Locate markets for the exporters; and/or
- iii) Develop a national export awareness.

Although the NTAE sector has generated additional foreign exchange, it is not clear how that income will affect the country's external debt situation since the debt is principally in the public sector while the profits from NTAEs accrue primarily to the private sector. In addition, the incentive packages offered to NTAE producers by the government constitute a reduction in state revenues.

Notwithstanding the recent slowdown in earnings, there has been a significant increase in the number of exporters -- from 666 in 1990 to 893 in 1993. The numbers of products exported has also increased -- by about 10% -- over the same period. These figures indicate that the NTAE sector is becoming an important provider of employment. An estimated 5,500 people are now directly or indirectly dependent on the NTAE sector.

As the development of the NTAE sector is still in its early stages, few spin-off activities have had time to materialize or mature. In addition, the potential forward

and backward linkages have yet to be exploited to the overall benefit of the country. In the meantime, however, those individual exporters, companies, farmers, and others directly and indirectly involved in NTAE activities continue to benefit, often in disproportionate numbers.

### **D.3. LOCAL-LEVEL ENVIRONMENTAL IMPACTS**

Given the complex and extended nature of ecosystems, environmental impacts sometimes take a long time to manifest themselves. As the NTAE program in Ghana is still very much in its infancy, it is not surprising that many of these effects have yet to reveal themselves. The inherent shortage of both qualitative and quantitative analyses is further compromised by the government's lack of capacity to be able to carry out thorough environmental impact assessments and its reluctance to call into question NTAE programs that are both bringing in much-needed revenues and providing much-needed employment.

The shortage of hard data means that anecdotal evidence is often the only evidence available. In an attempt to maximize the value of that evidence, the three studies that were conducted in the preparation of this report specifically sought out farmers' thoughts and attitudes about the future of NTAE production on the assumption that conditions there are likely to be ahead of national trends.

Generally speaking, the production of NTAE crops is considered a mixed blessing in the villages where the crops are actually cultivated. While there have been tangible improvements in the quality of life as a result of increased incomes and the government's provision of infrastructural improvements, there have also been some adverse socio-economic developments such as landlessness and widening income disparities. Perhaps more alarming are the deteriorations in the quality of local ecosystems. Some of the more prominent environmental problems associated with the production of the three NTAE crops are summarized below.

#### **D.3.1 Deforestation and Land Degradation**

Deforestation of all types has reduced the extent of Ghana's forests from about 8.2 million hectares at the turn of the century to about 2.1 million hectares today -- a loss of nearly three-quarters. This deforestation continues at an estimated annual rate of 72,000 hectares, primarily as the result of agricultural

encroachments, though timber exploitation, fuelwood gathering, and bushfires also play their parts.

The expansion of NTAE production plays a particularly significant role in the process of deforestation. Not only are more lands overall being cleared for production, but that production is forcing traditional food crop production into increasingly marginalized areas. Nowhere is this more apparent, and pernicious, than in the expansion into steeply-sloped hillsides that are unsuited for cultivation. Such expansion invariably causes the land degradation and soil erosion which can seriously jeopardize production in adjacent lowland areas.

The problems associated with deforestation are particularly evident for pineapples (because of the necessity of their being near transportation centers) and yams (because of their need for stakes). As discussed above, yam cultivation depends upon the annual clearing of new plots, a task that is usually accomplished by fire. It is therefore not a coincidence that the highest percentage of bushfires recorded every year in Ghana comes from the yam-growing regions. Between staking and clearing, it has been estimated that approximately two acres are deforested for every one acre of yams cultivated.

Although there are no up-to-date data on the specific effects of bushfires in the yam-producing villages, a study by Brookman-Amissah in 1976 which was carried out in the yam-growing areas (savannah zones) shows that:

- i) Fire affects the delicate ecological balance between the woody and herbaceous components of the vegetation, a balance which is otherwise determined by the forces of natural competition.
- ii) Early dry season fires retard, but do not stop, the development of woody vegetation by destroying a considerable portion of the natural regeneration of fire-sensitive species.
- iii) Late dry season fires are particularly destructive to all but the most resistant trees and shrubs.

Brookman-Amissah observed that bushfires cause significant increases in the surface temperatures of the soil: anywhere between 100 and 850°C. Meanwhile, temperatures at a depth of about 2 cm. may vary by

*How much is permanent deforestation?*

only as much as 140C. Under these conditions, he concluded, many macro and micro flora and fauna are destroyed, thus resulting in changes in the physical and chemical nature of the soil.

The burning of vegetation and crop wastes often has additional undesirable effects. For example, fires that get out of control may affect nearby settlements and destroy valuable watersheds or other natural habitats. Smoke and particulates may also create a considerable local nuisance. Potentially much more serious -- but essentially impossible to quantify -- are the global consequences arising from the emission of gases which affect the ozone layer and the global climate. Although actual rates of deforestation that can be directly attributed to NTAE production are not known -- and perhaps not knowable -- it is clear that the process will intensify in the future, if measures are not taken to control the expansion of NTAE production into forested and sloped land.

In other areas, the growth of NTAE production does not entail the clearing of forested land per se, but rather the conversion of diverse subsistence crops or grains to monoculture systems. These land use changes not only reduce the availability of food crops for local consumption, they compromise the integrity of the natural ecosystem and thus jeopardize the carrying capacity of the land.

### D.3.2 Soil Capability and Erosion

Ghana is naturally endowed with a variety of soil resources suitable for agriculture, but the optimal production of any particular NTAE crops requires particular soil types, nutrients, and climatic conditions. An analysis to determine soil capability for specific NTAEs resulted in the delineation of five main agroclimatic zones. If producers do not cultivate NTAE crops in those areas which have appropriate soils, production will suffer and soil degradation may occur as well.

Most of the upland soils described as 'suitable' for NTAEs are fragile and susceptible to soil erosion, especially when large tracts are cleared for monocropping of annual crops. Already over half the land under production in Ghana has been determined to be subject to erosion. This is particularly likely when producers cultivate in steep areas and do not use soil conservation practices. For example, in some areas of pineapple production, the farmers' failure to plant on the contour has provoked erosion.

Soil erosion leads to degradation of soil structure and declining fertility, both of which result in internalized costs to farmers. It also can provoke off-farm damages to other farmlands and resources. For example, increased soil runoff into the Densu river as a result of increasing pineapple production has resulted in siltation that disrupts fisheries and causes water pollution.

In addition, when cultivation and other farm practices are mechanized for a long period, the subsoils tend to become compacted. The widespread use of bulldozers in Kwahu Praso to level the land for pineapple production is a major contributing factor to soil compaction. When this happens, the exploitable volume is reduced as air and water and roots cannot penetrate through the compacted layer. As a result, drainage is reduced at plough depth, thus promoting salinity problems, especially when fertilizers are regularly used.

One important reason for the increasing degradation of the land is the breakdown of traditional conservation mechanisms. Once the long fallow period of traditional farming systems (which allows for the regeneration of organic matter) is ignored, the consequence is a rapid loss of soil fertility. As a result of the active and continuous production of NTAEs, land degradation is on the increase in both the yam and pineapple growing areas.

Soil conservation practices are rarely implemented in the pineapple growing areas. The consequence has been a severe decline in physical and mechanical properties as a result of structural deterioration. The continuous application of fertilizers, herbicides, and insecticides only destroys the potential of the land to regenerate itself through the natural processes. The results of all these practices is the near complete degradation of some of the land in Kwahu Praso. Many old farms have had to be abandoned there, rendered infertile by years of inappropriate mechanical ploughing and chemical inputs. Today, they are bare and unproductive.

Detailed data is not available on the transformations of land use that have occurred for NTAE production, and more information is clearly needed to understand the extent of deforestation and the repercussions of crop substitution. In any case, that area is likely to expand with further increases in NTAE production.

### D.3.3 Impacts of Fertilizers

Although the use of fertilizer may be useful and needed in some crops for contributing to increases in yields and quality of products, the improper use of fertilizers can

have negative impacts on production as well as harmful off-farm effects. In particular, when pineapple farmers use fertilizers excessively or with an inappropriate nutrient balance, the fruit of the pineapple may be harmed. Incorrectly balanced fertilizer applications will create undesirable levels of sweetness and a shortened shelf-life, both of which cause them to fall short of export standards.

In addition, chemical fertilizers are easily washed off into streams, rivers, and other drainage areas, where they become sources of pollution. When deposited into rivers and streams, heavy loads of chemical fertilizers contribute to an increased growth of vegetation and weed, which leads to eutrophication and reduced water volume. This disrupts fish and aquatic life, as well as reducing the quality and quantity of water available for human consumption.

#### D.3.4 Chemical Pollution

NTAE producers use considerable volumes of pesticides, including insecticides, nematicides, fungicides, and herbicides, to control a variety of pests and diseases. This use is especially prevalent and high in perishable crops, such as pineapples, which are subject to stringent quality controls (See section C.1.3). Though export levels have been maintained as a consequence, the excessive use of these chemicals has had some adverse impacts on the productivity, health, and the effective functioning of local ecosystems. More serious effects, especially those in human health, could still be in the "ecosystem" pipeline.

Large-scale monocultural plantations tend to use the largest amounts of pesticides per hectare, partly because their homogeneous conditions tend to be more susceptible to pests, and because they have strong economic pressures for increasing yields. Prior to the recent large-scale production of pineapples for export, the use of agro-chemicals was relatively unknown in the villages of Nsawam. Now, 98 percent of the farmers in the area use a wide variety of imported or locally concocted chemicals for planting, inducing fruiting, fruit coloration, and preservation.<sup>4</sup>

<sup>4</sup> On the other hand, pineapples produced for juicing or canning (rather than for fresh export) are not required to be of as high or uniform a quality. Their production, therefore, usually entails lower pesticide use.

The widespread ignorance of the dangers of pests is the main cause of the growth in pesticide use among pineapple farmers. Problems of pesticide misuse are particularly evident among smallholders. The reasons for the problems are largely related to the users' lack of information about alternative non-chemical methods of pest control, their lack of experience and information about safe and effective agrochemical use, and their lack of capital for purchasing appropriate equipment and products. Although these smallholders may already be familiar with NTAE crops, the switch to commercial production often obliges them to use chemicals with which they are often unfamiliar.

In addition, both small and large-scale farmers tend to use pesticides as a 'weapon,' sometimes believing the myth that 'more is better,' rather than using chemicals judiciously and selectively. About 98 percent of the small-scale pineapple farmers, particularly those on the fringes of the large-scale pineapple farms, overestimate the dangers of pest and the likelihood of their outbreak. Pesticides are employed primarily as an insurance measure. Over 90 percent of the farmers interviewed calendar spray, that is, spraying at pre-set times regardless of current pest populations. In thinking that they are protecting themselves against disastrous situations, they are in reality enhancing pest resistance and the likelihood of resurgences and thus increasing the possibility of a disaster. *data?*

These chemicals are very expensive, signifying a large cost burden on producers. In addition, several negative effects emerge from their inappropriate use:

a. Residues in products: If pesticides are applied in excessive dosages or too close to the harvest time, the residues accumulate in the fruit in levels that exceed the residue standards established by the governments of the importing countries. Consequently, when such a violation is detected in the import inspection process, the entire shipment of the product is rejected for import, resulting in serious financial losses to the producers. This form of rejection from pesticide contamination has rarely happened in Ghana, but it has occurred in numerous other countries where NTAEs are being promoted, and the rejections have resulted in losses of millions of dollars. With the rapid expansion of NTAEs and the increase in pesticide use, this will become an increasingly serious risk to Ghanaian producers, especially as they face increased competition from other countries for market share. The problem of residue accumulation in products is particularly serious for persistent pesticide products, such as organochlorines;

and residues in excessive levels also pose health hazards to the consumers.

b. Contamination of Water, Soil, and Vegetation: Some kinds of pesticides also accumulate in the wider environment -- in the water, soil, and vegetation, and air; and when they are used irrationally, they may result in pollution/contamination problems. For example, it has been reported that some small pineapple farmers have harmed their own crops and vegetation in their farms when they have used herbicides that are unsuited for the particular weed, or applied improper dosages. Pesticide contamination of the Densu River is suspected from the runoff of pineapple plantations. Soils in pineapple plantations also may be harmed with the accumulation of toxic nematicides which disrupt the useful functions of natural soil microorganisms over time. The extent of kinds of problems require further examination, and measures are needed to avoid such hazards.

The study showed that about 95 percent of the pineapple farmers in the Nsawam area do not take the proper precautions when cleaning agro-chemical equipment. Poor disposal of empty containers is also common; often they are simply left at the edge of the farm. Frequently the bottles and tins are resold to other members of the community for various uses, thus spreading the circle of exposure.

The tendency of washing out sprayers and containers in streams especially in the Densu River, which is also used for drinking, bathing, and washing clothes, exposes an even larger population to pesticide poisoning. A study carried out by the Water Resources Research Institute (WRI) of the Council for Scientific and Industrial Research (CSIR) in 1986 showed that the Densu River was highly polluted from Densu to Weija. The study went on to point out that there were seasonal variations: during periods of high flows, concentrations of the various pollutants decreased due to the effects of dilution. But the fact that dissolved oxygen concentrations also fell, may well be attributable to the presence of agricultural chemicals in runoffs.

c. Harm to Users' Health: Pesticides can also harm the health of those who apply the products and other people who are exposed. The types of health impacts from pesticide exposure are categorized into acute and chronic damages. Acute effects are primarily poisonings, associated with symptoms such as vomiting, fever, vertigo, diarrhea, delirium, muscular convulsions,

neural damage, or even death; and they are provoked usually by direct exposure to toxic products. The number of pesticide poisonings in Ghana per year is not known, but the incidence of the problem is likely to increase as the use of pesticides increases in NTAEs. Chronic effects include longer term impacts that are caused from exposure to pesticides, and they include headaches, allergies, dizziness, dermatitis, blurred vision, or mutagenic or carcinogenic effects that often take years to manifest themselves.

People who apply the pesticides and those who work on the farms immediately after the application, are always those most likely to be affected. In all of the pineapple growing villages, precautionary measures such as protective clothing and staying out of fields immediately after application are rarely followed, either out of ignorance (either their own or the lack of information provided by pesticide distributors), cost, or discomfort. Most of the farmers complained of skin diseases and periodic vomiting which could be attributed to pesticide poisoning.

As NTAE production continues to increase, so too will the risk and numbers of poisonings and chronic damages from chemicals unless measures are taken to ensure rational integrated pest management and safe chemical use. Unfortunately, the existing legislation does not adequately prevent farmers from using toxic chemicals or protect them if they do. There are no specific legislation on the importation, sale, distribution, production, and use of pesticides. Specific tolerance levels for maximum pesticide residue concentration in or on agricultural commodities have not been set; nor is there any institution charged specifically with the responsibility of monitoring the sale, distribution, and use of pesticides. As a result, highly toxic chemicals like DDT are still being used, especially in the kola growing areas.

The Environmental Protection Agency, in collaboration with the Ministry of Food and Agriculture, has been examining applications for the importation of agro-chemicals into the country, presumably to ensure that only safe and environmentally friendly chemicals are used. According to the prescribed procedure, all prospective importers must first apply to the EPA for a permit to import the particular agro-chemical. All applications are to be accompanied by the necessary dossiers on the chemical, indicating such information as the active ingredients, formulation, target crops, and toxicity data. If an application is found to be acceptable, the applicant is granted a provisional certificate to

import. All approvals by the EPA are subject to review after a specific period of use when further investigations are expected to have been undertaken into the environmental impacts of the chemicals.

Unfortunately, the EPA procedures are only an administrative arrangement. As they have no legal backing, importers may choose to ignore the directives. Customs officials tend to permit the importation of even the most toxic chemicals on the grounds that there is no specific legislation requiring them not to. The other aspect of pesticides control which is grossly neglected in Ghana is research into the impact of pesticides (toxic chemicals) on human health and the environment.

Even though the Environmental Protection Agency has the mandate to screen all chemicals imported into the country, toxic chemicals are easily smuggled in through unapproved entry points. The farmers in the Nsawam pineapple growing area pointed out that before the large-scale production of pineapples in the area, they had no problem with pest infestation. They suggested that pests might have been introduced as a consequence of large-scale production activities (extensive clearing and heavy chemical use) having destroyed the ecological balance of the area.

In February, 1988, the use of five pesticides, Aldrex 40, Dieldrin, Azodrin, Parathion and Malathion was banned because of their long-term residual effect on the environment. The misapplication of pesticides in the country has quickly led to immunization in certain pests.

d. Resistance - The 'Pesticide Treadmill': Finally, a significant long-term effect and risk of pesticide use is resistance of pests to products. It is well-known fact that pests develop resistance to chemicals through basic genetic selection processes. As a result, most pesticides lose efficacy over time. The typical response is just to increase the application, but this only serves to aggravate resistance, which leads to even higher applications of ever more toxic pesticides. The end result of this "addiction" cycle is a dependence on pesticides that are ineffective. Not only are input costs increased, output is decreased. High economic losses are soon inevitable.

The incidence of resistance in pineapples and other NTAE crops in Ghana has not yet been documented, but this pattern has occurred in other countries and inevitably will occur in Ghana as well if chemical-intensive production methods are continued. A study

carried out by the Department of Crop Science of the University of Ghana (Legon), for example, shows that there is already a serious case of resistance in the diamond-back moth (*Plutella xylostella*). The report points out that the insecticides Ripcord and Cymbush 10Ec, as well as various concoctions of these and Elocron and Perfekthion are being used at levels two or three times their recommended doses at three, four, and five-day intervals. The report attributes the development of resistances and cross resistances among the currently used insecticides to the misapplication of these pesticides.

In sum, these actual and potential negative impacts from pesticides create high costs and risks which can offset economic returns. Avoiding these kinds of problems is possible (and essential), through integrated pest management methods and only minimal safe application of pesticides. Furthermore, all of these negative effects can be avoided in crops such as kola nuts and yams that rarely use pesticides. In this sense, kola nuts and yams appear to be more ecologically compatible and less expensive than crops that are more chemical intensive.

#### D.3.5 Agroecological Diversity Impacts

Although the promotion of NTAE crops is intended to encourage diversification, the conversion of local food production to NTAE production sometimes entails a switch from heterogenous production systems (with a diversity of crops and vegetative types), to less diverse and even monocultural systems. Thus, though NTAEs are intended to increase export diversification on the national scale, they actually decrease biological diversity on a local scale by replacing forests or otherwise diverse vegetation for monocrop cultivation and the application of agro-chemicals that curtail growth other than that of the export crop.

Moreover, standardized varieties and uniform genetic stock are often required by international markets. This reduction of diversity within agroecosystems may have some advantages for economies of scale and efficiency, but the reduction of crop diversity can increase the agroecosystem's vulnerability to pests and diseases, reduce the number and level of nutrients in the farming system, and actually increase the economic risks of production to farmers who depend on a single species or crop. Conversion to new, standardized seeds may also mean the loss of indigenous seed varieties.

In the case of kola nuts, however, production generally maintains a diversity of crop species, since they are commonly intercropped with cocoa trees; and this type

of agroforestry system therefore has agroecological advantages.

### D.3.6 Socio-Economic Impacts

The development of NTAE production in Ghana involves unique socioeconomic impacts that are interrelated with the environmental factors in some situations. In particular, it is important to consider the distribution of benefits of NTAE production -- i.e., who are the main beneficiaries of NTAEs? how is it contributing to local economic and social development?

One of the unique characteristics of NTAE production in Ghana is that a large proportion of the production is done by small-scale producers. Although specific survey data is not available, rough estimates suggest that 80-90 percent of the total value of NTAEs come from small-scale farmers. In fact, some of the crops are 'traditional' to smallholders for internal markets. Since small farmers have been producing kola nuts, yams, and even pineapples for generations for their own consumption, the switch to export production offers them special opportunities. In these cases, the small farmers frequently become 'outgrowers' who sell their produce to the large buyers and exporters. Furthermore, the Ghana Export Promotion Council has formed 'Export Production Villages' in five areas, which help support NTAEs for small producers. In sum, early indicators suggest that the NTAE sector appears to benefit a broad spectrum of farmers throughout the country.

At the same time, however, Ghana has several very large-scale NTAE producers, particularly in the case of pineapples, whose share of production is growing to unprecedented levels. The very size of their operations allows these framers to enjoy a higher level of efficiency and productivity. They also tend to have influential and prominent positions in the NTAE sector, thus allowing them enhanced access to capital, technology, marketing connections, and the infrastructure required for export production.

All these competitive advantages combine to ensure higher profitability for the large-scale producers. As their profitability is only furthered by the acquisition of even more land, the large-scale producers are encouraged to take advantage of their higher income levels to acquire the land of nearby smallholders. As a result of these dynamics, there is a land-consolidation process currently underway in the most productive parts of the pineapple-growing region. Not only are many

small-scale farmers being outproduced into selling their land, those that do remain are finding themselves forced to cultivate increasingly marginal land, particularly on unstable hillsides. This process contributes to deforestation and land degradation.

Both small and large-scale farmers have to adapt their production practices to new standards and requirements for export markets, but small farmers face special constraints in this situation. Poor farmers often lack access to information and inputs for NTAE production, and therefore may be unable to meet the quality criteria. They also tend to lack credit resources and information for safe and rational use of agrochemicals (as noted earlier), so that they are particularly susceptible to problems from agrochemicals. The small NTAE farmers have not been given attention and technical assistance that they need.

Furthermore, NTAE production has the potential to generate off-farm employment and small rural industries in some situations. In other countries (especially in Central America), the growth of small processing industries, such as canning or juicing factories, has had a substantial impact on the NTAE sector. At present, Ghana only has two small processing plants. If planned carefully, the expansion of this sector can increase socioeconomic benefits by minimizing the risks of exporting perishable crops, as well as adding value to the product before it is exported.

#### D.3.6.1 Landlessness

The introduction of pineapple cultivation to the Nsawam area in response to the NTAE promotion programme appears to have increased the level of landlessness and economic inequalities. Before, land was rarely sold because it was communally owned. Individual members of the group had access to any part of the family or clan land. Today, about 50 percent of the pineapple farmers in the areas around Kuntuse obtained their land by direct purchase or leasehold. Most of these are from other parts of the country.

As the production of pineapples has proven quite lucrative, land values and rents have increased accordingly. Mechanized production favors large-scale farmers who have come to enjoy a competitive advantage. Their success has allowed them the wherewithal and the incentive to buy out smaller, and hence poorer, farmers. Small farmers who own their own land, but are increasingly unable to compete with the large-scale producers, often have little recourse but

to sell. The dual results of this are an increase in landlessness and a further concentration of economic and social power in the hands of fewer people.

Rising land values are also squeezing out those small farmers who were producing food crops for domestic consumption. As the economic returns of domestic production are generally less than those for export production, these farmers rarely have the capital needed to switch to NTAE crops. As a result, they are often tempted to sell out to their large-scale producing neighbours. It is from these displaced farmers that the large-scale pineapple producers obtain much of their labour.

#### D.3.6.2 Lack of Credit

Unlike traditional crops that use local seed and relatively small quantities of fertilizers and pesticides, NTAE crops require a complete package of seeds, fertilizers, and pesticides, and equipment like sprayers, all of which are imported. The initial investment is so high the peasant farmers can not qualify for the necessary credit from the bank because they are not able to come up with the required collateral security.

Large-scale pineapple farmers, however, do not have these credit problems, and can easily hire consultants to assist in the production of high cosmetic products to meet market demands. Therefore, most peasant farmers who have taken up NTAE crop production, particularly pineapple and yams, have had to abandon their efforts because of financial problems.

NTAE crop production has led to the collapse of some indigenous crops. Because of the government's special attention to the promotion of these crops, farmers tend to focus exclusively on the NTAE crops. Extension officers are assigned to the communities on the basis of export crop production. Hence access for technical assistance has been severely restricted for the poorest farmers, those producing basic foodstuffs such as cassava, maize, and vegetables. As a result, the production of local foodstuff for subsistence has been on the sharp decline. In the absence of sufficient quantities of technical advice, improved seeds, and agricultural inputs, yields have been low and prices relatively high as compared to villages which have not specialised in the NTAE crop production.

#### D.3.6.3 Employment and Economic Risks

Numerous employment opportunities are generated in NTAE crop-producing villages by the needs of land preparation and planting, maintenance, harvesting, packaging, and marketing. In the Nsawam pineapple-growing area, the labour supply or source can be classified into three main types: family, hired local labour, and hired migrant labour.

In the village of Kuntuse, 54 percent of the labour in the pineapple farms comes from local sources, 36 percent from migrants, and 10 percent is family labour. The migrant workers include those with specialised skills or knowledge. These migrant workers could be machine operators, agriculturists, extension officers, food specialists, or mechanical engineers -- all of which are not readily available at the local level.

The socio-economic life of the village of Kuntuse is inextricably interwoven with the NTAE business, and hence, is vulnerable to price fluctuations, especially at the international level. It is also vulnerable to the other vagaries of export trade. For example, when the Kotoka International Airport was closed down for three months in 1993 due to cracks in the tarmac, many commercial exporters could not pay their workers. The peasant farmers who cultivated only pineapple also suffered as local demand could not absorb the output within the period. As a result, most of the pineapple crop could not be sold, and the village economy collapsed.

#### D.3.6.4 Women's Labour

Women are employed in all the stages of the NTAE production and marketing. At Kuntuse, female labour constituted about 30 percent of the locally hired labour and about 64 percent of the entire NTAE labour force. When planting pineapple suckers, female labour is preferred because the tedious nature of the work requires considerable patience. During farm management, harvesting and packaging, women are preferred for the same reason.

It is interesting to note that all workers at various stages of production receive equal pay irrespective of gender differences. The planting and harvesting of yams are done by men, but the collection of the yams from the farms and marketing are the exclusive preserve of the women. In kola production, the planting, weeding and harvesting activities are carried out by men, while the collection, sorting and marketing is done by women. Any significant disturbance in the NTAE business

directly affects women and the entire family. It must be pointed out that proceed from the women's income support the family, the children school, health and social needs.

**E. RESPONSES TO ENVIRONMENTAL IMPACTS IN NTAE PRODUCTION: RECOMMENDED POLICY REFORMS, MITIGATION, MONITORING & RESEARCH**

Diversifying the economy through the production and export of NTAEs is important for economic and social development in Ghana. And while more research is needed to acquire complete information on the environmental impacts, the above overview of actual and potential environmental and social impacts suggests that policy reforms, mitigative actions, and monitoring activities are needed if NTAE production is to be done in a sustainable and productive way. The objective is not to recommend that NTAEs should be abolished, but to attempt to address the critical promotional policy bottlenecks, so that adverse effects are mitigated or eliminated to ensure the sustainability of NTAE business. Some important initiatives, summarized below, will require coordination and a leading responsibility by the Environmental Protection Agency (EPA). They will also require actions and collaboration by public institutions, farmers, and the private sector.

**E.1 Policy, Institutional, and Legislative Reforms**

The present encouraging performance of the NTAE sector can only be sustained through sound policy, legislative, and institutional framework. The existing policies in agriculture, trade, exchange rates, and the environment generally favor expansion in non-traditional agroexports. But these policies should also coincide with the government's broader policies promoting decentralization and private sector expansion, and the National Environmental policy which seeks to reconcile economic development and resource conditions. Even more importantly, they need to be harmonized to avoid and/or reduce undesirable land use conflicts and adverse environmental impacts.

**E.1.1 Broader Participation in Policy Dialogue on NTAEs**

Public institutions involved in the various aspects of the

NTE process include GEPC, the Ghana Investment Centre (GIC), Customs Excise and Preventive Services (CEPS), and the Ministries of Trade, Tourism, and Agriculture. In order to sustain and plan the successful and sound expansion of NTAEs, policy dialogue and coordination is needed among these organizations. The Environmental Protection Agency should be involved as an active member in policy dialogue and decision-making. Non-government organizations or associations (e.g., the Horticultural Association) should also be involved in the NTE policy formulation. Any policy changes proposed in the policy dialogues must be analyzed in terms of their environmental impacts and their fit with the promotion of sustainable growth of NTAEs.

**E.1.2 Legislative and Policy Enforcement Reforms**

Other policy reforms may be needed to help mitigate negative environmental impacts and to ensure the sustainability and equity of NTAE production. In particular, legislative or regulatory reforms may be needed in the following areas:

- land use policies to prevent deforestation and cultivation of marginal steeply-sloped lands and watersheds for NTAE production; ✓
- improved enforcement of pesticide policies and laws to avoid the negative impacts and ensure the sound use of chemicals; ?
- policy incentives to encourage alternative non-chemical means of pest control, soil conservation, and agroforestry; ✓
- improvement of infrastructure and marketing policies for NTAEs, especially to meet the needs of small-scale farmers; ✓
- review of land tenure policies, to ensure secure ownership and sustainability of production, especially for small-scale producers; ✓
- environmental standards that pertain to pollution levels in rivers and foods, and mechanisms to implement those standards, aimed to mitigate the off-farm impacts; ?
- establishment of guidelines for environmental impact reviews to examine new activities and investments that affect NTAEs; and ✓

- policy support for subsistence and local markets, to ensure food self-sufficiency and local nutrition needs so as to balance the support being given to exports.

All of these policies to improve the sustainability of NTAE production should be incorporated into overall governmental planning. If focus on yield maximization and financial targets is pursued at the expense of the natural resource base, NTAE expansion may be jeopardized. Changes are needed to ensure a harmonious policy framework for sustained production.

### E.1.3. Institutional Strengthening

7  
what's needed  
Activities concerning mitigation of environmental impacts of NTAEs coincide with the interests and activities of the EPA. However, some changes and improvements of capacities will be needed to strengthen the EPA to pursue policy-related work, mitigation measures, and NTAE monitoring. Moreover, efforts will be needed to build coordination among other institutions working on environmental issues.

## E.2 Mitigation Measures

The negative environmental impacts of NTAE production may be minimized or prevented through the adoption of mitigation measures related to land use, soils, agrochemicals, agronomic practices, and training. It should be realized that some of these problems are found not only in the NTAE sector; they require changes in the broader agricultural field. The following measures are therefore recommended to ensure the sustainability of NTAEs:

### E.2.1 Training and Education on Sound NTAE production

The increasing and improved production of NTAEs has necessitated the need to organize workshops and training for NTAE farmers, grower cooperatives, plantation owners/managers, workers, and extension agents. Educational opportunities for long-term courses and degrees, as well as short-term courses, will contribute to the overall productivity and sustainability of NTAE crops. The government, universities, donor agencies, and private sector will need to contribute to the development and implementation of training and educational programs. The main coordinating bodies should include the Ministry of Agriculture, the EPA, and the programs should last at least four years. The

following specific areas should be trained and encouraged in NTAE courses:

- a. Sound land Use -- including land-use planning, sustainable use of NTAE land, good tillage methods, agroforestry practices, and use of beneficial tree crops such as kola nuts in agroforestry.
- b. Soil Conservation and Fertility -- i.e., measures to avoid erosion and ensure soil conservation and soil fertility in NTAEs, including strip cropping, cover cropping, mulching, alley-cropping, intercropping, ploughing and ridging along the contour, rational and appropriate application of fertilizers, restricted use of agricultural machinery in areas with fragile soils or slopes, and soil capability analysis.
- c. Management of Pests and Pesticides -- especially Integrated Pest Management (IPM) in NTAEs, safe and rational pesticide use to avoid the negative impacts of pesticide use, with an emphasis on non-chemical methods that are feasible and economical, and use of pest monitoring and threshold analyses (Special attention needs to be given to workers who tend to lack information.).
- d. Other agroecological practices -- including rational use of water, fertilizer, and organic manures, nutrient management methods, and selection of varieties.

### E.2.2 Extension Services for NTAE Production and IPM

Also important is the need to develop reliable extension services for NTAE producers, especially to serve the needs of small farmers. Pineapple producers especially have mentioned that the lack of expert advice is a major constraint, and they have to seek expertise and information from other countries on specific agronomic issues in NTAEs. Often, such information is expensive and difficult to acquire. Extensionists need to give special attention to sustainable and environmentally sound practices which will contribute to productivity gains including sound land use, soil conservation, and IPM and pesticide management (as summarized above). The main implementing institution for this should be Extension Services of the MOA, but more resources

and people will be needed to strengthen their expertise. The private sector may have a collaborative role as well.

### **E.2.3 NTAE Processing and Transport Needs**

Capital, technological capacities, and infrastructure are needed to develop processing -- i.e., canning and juice-making -- as well as maritime transport for NTAEs. These capacities are particularly crucial for pineapple since the requirements for fruit produced for canning and juicing are less strict than they are for fresh fruit exports, and hence, allow for lower inputs of chemicals in their production. Also, shipping by boat rather than air enables exporters to export different qualities of fruit that can be produced with less chemicals. At the present time, a great deal of fruit that is rejected because it does not meet fresh fruit quality standards, could be exported if it were canned or made into juice. At present there are only two large-scale processing companies in the country. Increasing this capacity could add value to crops, increase NTAE earnings, and reduce crop waste, as well as reducing expenses and potential problems from agrochemicals.

### **E.3. Further Diversification of NTAEs and On-Farm Practices**

A number of other agricultural crops have the potential to greatly expand their current contribution to export earnings, including an assortment of fruits, nuts, vegetables, and spices/herbs. Promising fruits and nuts -- mostly tree crops -- include oil palm, mango, papaya, coconut, banana/plantain, and cashew. These tree crops are important not only because of their production potential and export value, but also because their cultivation techniques are already well known to smallholders and thus more likely to be effectively adopted on a sustainable basis. In addition, perennial tree crops also protect the soil and reduce the risks of wind and water erosion. Some tree crops, such as cashew nuts and coconuts, have an extra advantage -- their durability and long shelf-lives allow for production outside the Greater Accra Region. Together these factors bode well for extensive smallholder production.

Palm oil and palm kernel oil became important export commodities in the early 1800s. The oil palm tree grows naturally in the closed-canopy forest zone. The export trade in oil palm products has been informal and has fluctuated widely during the past century. In recent years, the cultivation and export of oil palm has

increased mainly as a result of government encouragement, export opportunities, and the introduction of high and quick yielding varieties. At present, there are only a few large oil palm plantations in Ghana; the majority of production comes from smallholder farmers who clear nearby land. Hybrid oil palms are usually monocropped; production often involves the use of agrochemicals.

Vegetables such as peppers/chilies, okra, eggplant, and beans are produced year round in Ghana. Though there is a year round export demand for these crops, winter scarcities in Europe (from October to March) offer the greatest economic opportunity for Ghanaian farmers. Vegetable production, however, usually involves the use of agrochemicals including fertilizers and pesticides. As most vegetables have a short shelf-life and must be carefully handled to avoid damage, farms need to be located close to ports.

Finally, two spices with significant potential for export are black pepper and ginger. Black pepper is found growing wild in the closed-canopy forest zones. Both of these spices can be commercially grown in the Eastern and Western Regions and areas along the fringes of the closed-canopy forests of Kintampo, Wenchi, Sunyani, and Kete Krachi.

### **E.4. Development of Monitoring Capacities**

An important way to help achieve the sustainable production of NTAEs is to develop an effective monitoring system. There is a need for improved knowledge about the resource factors, capabilities, and interacting elements that affect and emerge from NTAE production.

A fair amount of environmental data and information already exists in the country. However, these are scattered, uncoordinated, and inadequate. A major shortcoming of the current monitoring system is the lack of a common framework and collection center. In addition, data collected does not provide complete information on the social, cultural, and economic aspects of the human environment.

Monitoring of the impacted areas of NTAE crops should be carried out by a number of government ministries, departments, and research institutions in a coordinated way. These agencies have specific mandates which control their routine activities. Their

mandates should be modified in order to include the monitoring of indicators pertaining to the sustainability of NTAEs.

In order to ensure effective monitoring and evaluation of the agroexport sector, the establishment of a National Environment Information System (NEIS) within the EPC as proposed under the Ghana Environmental Action Plan (GEAP) is warranted. The NEIS is administered by the EPC, but is a network of information centers and institutions that work in the environmental field. All institutions participating in the monitoring process and those gathering other environmental data will be required to furnish the EPA with prescribed data periodically. The NEIS has already started performing in a limited way. Its main functions are:

- a. to provide an information referral service on a wide range of environmental subjects;
- b. to serve as a readily accessible archive of homogenous data sets on environmental quality;
- c. to provide organized data on the state of the environment through publications and other means and to serve as information support for development planning;
- d. to provide a means for early warning and evaluating the impact of development and environmental activities; and
- e. to provide inputs for environmental education programs.

The main services to be provided by the NEIS will include referral, data bank, data synthesis services, and publication and information support. The EPA with other agencies will prepare annual National Environmental Data Reports and other information. The reports will provide data on the quality of Ghana's environment and natural resource bases, including sector-specific profiles of the economy, including the production of agroexport crops.

Increased activities on NTAEs will imply additional responsibilities for institutions involved in monitoring, evaluation, and other activities. Special measures may be needed to ensure the incorporation of monitoring procedures that pertain to environmental impacts of

NTAEs in the NEIS. The institutions that will collaborate with the EPA in the monitoring include:

- Ministry of Agriculture (Crop Services, Research and Extension and Plant Protection and Regulatory Services)
- Plant Protection and Regulatory Services
- Institute of Aquatic Biology, Council for Scientific and Industrial Research (CSIR)
- Water Resources Research Institute, CSIR
- Food Research Institute, CSIR
- Soils Research Institute, CSIR
- Department of Geography and Resource Development, UG
- Ghana Atomic Energy Commission
- Environmental Protection Agency.

The Ministry of Agriculture has statutory responsibility for agricultural activities and the respective departments identified perform general roles which pertain to the production of NTAE crops, e.g., with respect to crop species and yields, extension services, and application of agrochemicals.

The research institutes of the CSIR have specific mandates governing their activities. Their participation in research and monitoring activities with respect to the NTAE sector will exert additional pressure on their already limited resources. The Geography Department of the University of Ghana, the Ghana Atomic Energy Commission (GEAC), and the EPA have similar and important roles to play in promoting greater productivity within the non-traditional export commodity sector. However, the quality and reliability of their service delivery system falls short of what is required by an expanding NTAE sector. This is due mainly to the inadequate resources. The institutions need additional resources to enable them to render useful services. For example, the EPA could benefit from training in data management and analysis.

For effective monitoring of changes in the quality of land and other natural resources, baseline data and information will be systematically assessed and

measured on several indicators. The indicators must be carefully selected to ensure they correspond to the environmental impacts of NTAEs. The following is a partial list of suggested indicators for monitoring.

**a. Land-Use Trends**

- Deforestation (location and rates) in NTAE area
- Changes in natural versus cultivated area
- Changes in vegetation (maps, Geographic Information)
- Cropping/fallow periods
- Introduction of new land uses.

**b. Measures in Soils**

- Erosion indicators
- Soil fertility measures
- Soil capability (agricultural potential) analysis

**c. Data on Agrochemicals and Pest Control**

- Volumes and types of agrochemicals used in NTAEs
- Residue levels in products
- Agrochemical levels in soils and water with special attention to pollution in the Densu River
- Pesticide poisoning and other health impacts
- Data on integrated pest management methods
- Monitoring of pest resistance

**d. Agroecological Data**

- Agricultural yields
- Crop species
- Crop diversity indices on cultivated land
- Biodiversity indices on fallow fields
- Appearance and frequency of indicator species

**E.5. Research Gaps**

Though the NTAE strategy has been in place for over a decade, the full range of environmental and socioeconomic impacts of NTAEs are either poorly understood or not even unknown. As the government aims to increase production of NTAEs, it is urgent to improve data and understanding in this area. Several research priorities can be identified. Some priority issues are:

- a. Local Environmental Impacts of NTAEs.
- b. Agrochemical Use and IPM in NTAEs
- c. Impacts of Pineapple Production on the Akwapim Hills
- d. Environmental Impacts of Yam Production in Fragile Zones
- e. Improved Production of Traditional Crops
- f. Natural Resource Accounts
- g. Private Sector Research Activities

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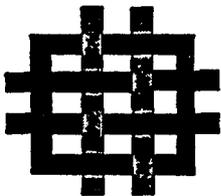
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