Coping with the effects of the 1982-83 drought in Ghana The view from the village

George J.S. Dei*

RÉSUMÉ. Le présent article étudie les réactions d'une communauté rurale ghanéenne face aux effets de la sécheresse de 1982-83 sur l'économie locale. L'auteur a amplement puisé dans la période de 1982-83 pour documenter sa recherche sur les différents mécanismes mis en place par les agriculteurs de la ville d'Ayirebi, près d'Akyem Oda dans l'Est du Ghana pour faire face à ces effets. L'article souligne les facteurs qui ont permis aux populations de contrer les effets de la sécheresse sur l'économie nationale; il s'agit notamment de la souplesse de l'économie de subsistance, du développement des activités de cueillette et de chasse et de la solidité des relations sociales qui prévalent entre les membres de la communauté d'une part et entre la communauté et les groupes voisins d'autre part. Cette étude met en lumière le retour a l'exploitation des ressources forestières considérée comme une stratégie de lutte importante.

Introduction: The crisis within the Ghanaian National Economy

Ghana has been described as an economic basket case due to the magnitude of her national problems[1]. Indeed, part of the country's problems can be attributed to such internal problems as political instability over the past two decades, corruption, mismanagement and smuggling. To a great extent, however, the prolonged crises within the economy can be blamed on the nature of the country's articulation with the world capitalist economy. The chronic problems of import-export deficit, acute foreign exchange, rising national debts and a decline in over-all production, are both directly and indirectly linked to the unfavorable terms of international trade and division of labour.

As far as the period between 1982-83 is concerned, the fundamental economic problem that faced the nation and in fact most Third World countries was the lack of customers for their products following the decline in economic activity in the industrialized countries. To a great extent, the major contributory factor underlying the world recession was the massive increases in OPEC oil prices, particularly in late 1979, which initially redirected available funds into paying for oil instead of paying for durable consumer goods. It was also increases in oil prices that helped raise inflation levels worldwide. In their attempts to curb this rise, major industrial countries such as the United States

* Faculty of Environmental Studies - York University; Dept. of Anthropology, University of Western Ontario.

1 See 'Globe and Mail' (a Canadian national newspaper) issue of March 17, 1983 p. S8. See also Barker (1984: 11-31; 1985: 59) for similar observations of other countries in tropical Africa.

and Britain raised interest rates. The chain reaction was felt all over the world, and had tremendous impact on the developing countries.

In Ghana, the fall in the demand for most of the country's products, particularly cocoa, coupled with the declining world prices, meant that the nation was unable to pay for the products and industrial raw materials of the developed world. In a country dependent upon foreign imports, the effects of the global recession have had serious repercussions on national economic development.

In early 1983, the sudden expulsion of over 1.2 million ghanaians from Nigeria added to Ghana's problems. The impact of this massive and sudden influx of people on a country whose economy was already in a crisis was severe. Food and other basic requirements needed to rehabilitate the returnees were not readily available[1] (see also Brydon 1985).

Nature, also, did indeed exacerbate the ghanaian economic crisis with the worst drought in 48 years, which resulted in "... a devastation of farm lands, and a fall in the water level at the Akosombo dam to the extent that [begining in late 1983] electricity supply has had to be rationed' (see Ugochukwu 1984: 9). The stark reality of the persistent poor rainfall recorded in the country's history during this period can be measured by the fact that the dam lost nearly two-thirds of its water supply, hindering the hydroelectric generators that supply 65 per cent of the power for Ghana, Benin, and Upper Volta[2]. The drought of 1982-83 was the severest in a hundred years, and was preceded by a ten-year drought period. The general water scarcity forced people in towns

1 For example, it was estimated that the nation's cereal needs between January and the next harvest in August/September, 1983, stood at approximately 400,000 tonnes prior to the arrival of the deportees. Their sudden presence in the country in February-March, 1983, raised this requirement by 100,000 tonnes (see Bentsi-Enchill 1983: 463). Although international and local responses to the crisis were remarkable, the problems of limited storage capacity, transportation, and distribution served to hinder achievement of the desired full benefits for the suffering population.

2 In 1983, it was established that the Volta Lake averaged 3 metres below the minimum 87 m operating level needed for the hydroelectric station at Akosombo. Power supply for most parts of the country during the last quarter of the year had to be cut 40 per cent.

and villages to walk long distances in search of good drinking water. Even more devastating was the extremely low humidity figures that stayed below ten per cent during the prolonged dry season, and reaching as far south as the coastal areas of the country. Thus, 1982-83 has been recorded as the period during which the country witnessed one of the severest harmattan in its history.

The prolonged drought (August, 1982 - May, 1983) and the lengthy and unusually strong spell of harmattan dryness encouraged a series of bush fires that swept across the country, destroying field crops such as plaintains, yams, cocoyams, and cassava, as well as cocoa farms[1]. The extent of the damage caused by the bush fires has not been accurately assessed. National dailies throughout 1983 (and in fact, 1984) continued to carry numerous reports of raging bush fires that had caused extensive damage and destruction to property, farmlands, and human life across the length and breadth of the country[2]. One rough estimate is that hundreds of thousands of hectares (out of a total of 1.8 million hectares of cultivated land) had been affected by bush fires (see Doyle 1983: 821). Another unofficial estimate asserted that about 40 per cent of Ghana's food and cash crop output had been devastated; and, specifically for cocoa, the figure was put at over 300,000 acres of farmland destroyed[3].

ii. Manifestation of the National Stress Conditions at the Rural Village Level

The national conditions were reflected at the Ayirebi rural level to a degree. Ayirebi is a food farming forest community of about 4,300 people[4] in the Eastern region of Ghana, about 45 kilometres from the major urban centre of Akyem Oda, and nearly 180 kilometres north of the Ghanaian capital, Accra. The town occupies an area of approximately one and three-quarter

1 Others have also pointed to the practice of indiscriminate bush burning by traditional farmers preparing for the planting season; and also to the activities of palmwine tappers and, particularly, hunters who set fire to forest every year in order to hunt giant rats, porcupine, and other rodents for food. Certain individuals too, have attributed the bush fires to the work of "anti-revolutionaries" who, it is alleged, were bent on sabotating the Ghanaian revolution, hoping that the resulting economic hardships will cause disaffection among the population and lead to the downfall of the PNDC government. The truth of the matter, however, is that the incidence of bush fires accelerated in the country due to the environmental stresses of drought and the harmattan. During this period of extreme dryness, the traditional use of fire whether to clear land or hunt led to widespread burning.

2 See 'Ghanaian Times, (a Ghanaian national daily newspaper, Accra, issue of February 23, 1984, p. 4 for a catalogue of the most devasting facts on the bush fires.

3 See "Ghana: Crisis Hardly Begun", West Africa, April 25, 1984, p. 985; and also Ghana News, 12 (7): 9. (A news bulletin issued monthly by the Ghanaian High Commission in Ottawa, Canada).

4 This figure is based on projections of Ghana's population growth for the 1980's from the 1970 census data of 3,450 for the Ayirebi town (see Central Bureau of Statistics, Census Office Report, 1982, available at the Institute of Scientific, Social, and Economic Research, Legon). It should be mentioned that the official report of a late 1984 population census carried out in the country is not yet available to this researcher.

square kilometres, and its inhabitants are predominantly Twi-speaking, belonging to the Akan sub-group known as the Akyem.

In 1982-83, the people of Ayirebi experienced their share of the national economic and environmental stresses, which had repercussions on the nature of their contemporary subsistence adaptation. In the past, rainfall in this community had averaged over 1,650 mm annually. In the 1980's, however, there has been a gradual decline in the amount of rainfall. In 1982-83, the town recorded its poorest rainfall ever as reflected both in the total amounts and number of days of rainfall. Between October 1982 and September 1983, for example, the total annual rainfall had dropped from the 1970's[1] average of 1,686 mm to 933 mm. A careful study of the local rainfall data reveals that despite the reduction of the amount of rainfall in 1982-83, rainfed cultivation was not severely hampered. There was an appreciable amount of rainfall in the crucial food-planting months of April through June and between September and October. However, because of the overall reduction in the amount of rainfall and its erratic distribution, water supply for household use and consumption was reduced, particularly in the dry months of November to March. During these months, local streams and rivulets dried up forcing the inhabitants into extensive search for good drinking water. The fear of unclean drinking water causing Guinea worms and other intestinal diseases was prevalent in the community.

The harmattan of this period also affected the local farming. Some farmers had difficulty in getting the agricultural season started. The chilly mornings of January and February not only made an early rise from bed difficult, it also affected the farmers' ability to clear the forest. Because the afternoons were extremely hot and dry, farmers were again restricted in the farming activities particularly when the hot conditions extended through the months of February to April, the period of intense farming activities. Mean monthly maximum and minimum temperatures were 31.4c and 22c respectively, and relative humidity dropped from 95 to 61 per cent.

Although there has been an occasional incidence of bush fires in the past due to the activities of hunters and palm wine tappers, the picture in the dry months of 1983 was by far the worst in the town's recorded history. For example, in 1981 the records of the Town Development Committee show that six farmers reported a total of 7.5 hectares of farmland either partially or fully destroyed by bush fires. But in 1982, twelve farmers (six of them in december alone) reported a total of 21 hectares burned, and 59 hectares were recorded among thirthy-four farmers between January and May, 1983[2]. The breakdown of the 1983 figures is as follows: i) in January, six farmers reported an

1 See Ghana Meteorological Services, Annual Rainfall Reports, Headquarters, Accra.

2 Although it is possible that a few farmers might have failed to report the incidence of bush fires to the Town Development Committee, these are more likely to be those who suffered minimally. The incidence of bush fires became a major public concern, and gossip in the community was such that major disasters would have all come to this reseracher's attention.

estimated total of 8 hectares as partially or fully destroyed by bush fires; ii) February, seven farmers reported 17 hectares; iii) in March, nine farmers reported 25 hectares; iv) In April, seven farmers, 7 hectares; and finally v), in May, five farmers, 2 hectares. Among the food and cash crops destroyed by the fire were cocoyams, cassava, plantains, cocoa, and oil palm. The figure of 59 hectares for 1983 is out of an estimated total of about 450 hectares of cultivated land in Ayirebi.

There was also the stress on the local food economy during this period with the return of 298 Ayirebi town residents who had been deported from Nigeria in the early months of 1983[1]. As far as the rural socioeconomic life is concerned, the attendant consequences of the crisis in the national economy arising from the global recession were manifested in the areas of transportation and fuel and in the provision of basic medicines, as well as in the failure of the government to provide certain essential socioeconomic services to the people. The government's decision in the 1983 budget to increase the price of petrol resulted in the tripling of the transportation fare from the town to the nearest urban centre, Akyem Oda. This increase from the pre-budget fare of cedi 5 to cedi 15[2] also resulted in a series of price hikes for basic goods and services in the community. Not only did the prices of basic food items on the local market go up, but so did the cost of hired seasonal or wage labor on the farms[3]. When the total research study sample of 412 household heads[4] were asked to identify the single most essential group of basic items they missed most as a result of the national economic depression, their responses were: i) Fuel - kerosene, batteries, and matches (104 household heads, 25.2%; ii) Textile and clothing - children's school outfit, wax prints (99 household heads; 24%; iii) Stationery and toiletries - soap, school textbooks, pens, pencils, and writing paper (91, 22.1%); iv) Building materials - cement, tin roofing sheets (63, 15.3%; v) Medicines, (30, 7.3%); vi) Farming tools (21, 5.1%); and finally, miscellaneous items, such as sugar and milk (4,1%).

In specific reference to imported food items, most household heads expressed the view that although they miss these items they can do without them permanently if they are compelled to. It should be pointed out here that

1 Out of this figure of 298 returnees, 210 were males and 88 females. Their ages ranged from a three month old baby to a forty nine year old adult. The period between January and April, 1983, saw 217 of the returnees resettling in the village, and between May and October, 1983, an additionnal 81 people arrived.

2 During the research period, the exchange rate of the local currency, cedi, to the U.S. dollar was cedi 2.75 to US $ 1.

3 Prior to 1980, a hired farm labourer was paid roughly cedi 4 a day. In 1982, it had risen to between cedi 30 - cedi 40, and after the national budget of April, 1983, the wage had doubled to between cedi 70 - cedi 100 a day when the national inflation rate was over 350%.

4 The household as used in this research refers to a group of people usually (but not necessarily) living in a house or compound who have a common food supply, pool their incomes for common support and who regularly use and share the contents of a cooking pot. [For the kin composition of the household, see Dei 1986].

the taste for imported foreign foods (milk and milk products, tinned meat and fish, beverages, cooking fat, flour, oats, and sugar) have been acquired by individuals in the community ever since the penetration of the cash economy into the rural sector in pre-colonial times. When compared to locally produced foods, the contribution of these foreign foods appears to be relatively small; but what is relevant to note is that local diet in previous years reflected varying degrees of acculturation to external influences. In the prevailing national economic situation, these foreign foods have been remarkably absent from the local stores, shops, and market. In view of the prevailing economic and environmental stresses, one would expect that the ability of some farming households to produce enough foodstuffs to feed themselves and to meet the subsistance requirements of parasitic urban population would be impaired. It is necessary therefore to investigate the Ayrebi households' methods of coping with or surviving these stresses, focusing on drought coping mechanisms.

As the national economy collapsed around them, the people of Ayireby survived and flourished. The success of their village adaptation can be attributed to such factors as: the resilience and adaptability of the peasant economy; the people's ability to supplement agricultural production with wild food resources from the forest; and, the rebuilding and maintaining of strong social relations among village members (i.e., the importance of kinbased institutions of sharing, reciprocity, and other redistributive mechanisms in the community - see Dei 1986). The examination of the specific drought coping mechanisms or strategies shows that the exploitation of forest resources in particular was a popular economic activity among the village households during stress period.

Drought coping mechanisms

Expansion of Collecting Activity:

During the research period, Ayirebi households were observed to have reverted to traditional dietary patterns. In the process, the surrounding environment was heavily exploited to supply almost all the daily subsistence requirements of the average household. The ability to fall back on wild forest products is an important asset of the rural community. Women, the aged, children, and young adults of both sexes are generally responsible for the gathering of wild products, while adult males hunt and trap game (see Scudder 1971).

Some of the aged expressed profound knowledge of the numerous plants and animals which have been collected during the course of the town's history to be used either as food, beverages, condiments, or for medicinal purposes. It was observed that some of these forest plants and animals were still being exploited for similar purposes today. They include both edible and non-edible wild products such as roots, fibres, leaves, bark, fruits, seeds, nuts, insects, molluscs, honey, sap, and syrup. Honey collection is on a noticeable scale in this community. Other collected wild forest products were snails, crabs, mushrooms, and kola nuts (see Appendix 1, and also Dei 1986, 1988).

Of the various wild foods exploited bush animal protein is the most highly valued. Although as a result of deforestation, wildlife is said to be less plentiful now than in former times, game is not rare in the diet of the average household. Within the community, hunting and trapping activities are conducted mainly for food, and bush meat accounts for a substantial portion of all animal protein consumed in households. Generally, most game animals are available in the dry months of December through March when the bush is being prepared for cultivation. However, hunting and trapping by farmers and professional hunters, assumes special significance during the lean season (i.e., between May and August. The chief prey among the hunting and trapping population are grasscutter, "akrantee:, (*Thyrmomys swinderianus*) (which can yield as much as four kilos of smoked meat per animal), giant rat, "okisi" (*Critetomyx gambianus*), antelope "adowa", *(Neotragus pygamaeus*), and the brush-tailed porcupine "apese", (*Atherurus africanus).* All of these are rapidly renewable protein unlike most of the big game (see Posnansky 1980: 2149).

Financial and logistical constraints did not permit an accurate assessment of the amount of bush animal protein consumed in domestic households. However, rough estimates indicate that every household adult consumes not less than 250 grams of bush animal protein per week. Together with other animal products such as crabs, snails, and oil palm grubs, bush animal protein constitutes an important substitute for fish and beef in the household diet. Occasionally, households may depend on small amounts of poultry and livestock (sheep and goats) slaughtered for ritual purposes for protein in their diets. On the whole, the presence of a large number and variety of cultivated, wild, and semi-domesticated food plants and animals serve to produce a more varied and nutritious diet for the rural households than is available to their urban counterparts.

Experimentation with Marginal Varieties of Plants:

Four new varieties of plants were observed to be experimented upon for cultivation purposes. The plants were: i) *Dioscorea praehensils* (bush or forest yam) a root crop locally referred to as "ahabayere" and normally classified as a semi-domesticated yam; ii) *Afzelia bella*, a wild plant whose leaves are used as vegetables in soup making, and referred to locally as "papaonua"; iii) Napoleona vogelii, known as "obua" whose fruits are eaten as a delicacy; and iv) *Blighia welwitschii* known locally as "akyekobiri" whose leaves are also used to flavor soup.

Diversification of Crops or Mixed Cropping, and Planting of Drought Resistant Crops:

It was also observed that farm plots that normally were cultivated with a sole foodcrop (e.g., yams) were now being planted with multiple crops at the same time. Such farming strategy not only provided safeguards against crop failure, but also, was ecologically sound for the prevention of soil erosion. Also, more and more farming households turned their attention to the planting of drought-resistant crops such as cassava and cocoyam.

Table 1 summarizes the farming activities and food supplies in Ayireby households in relation to the seasons. As part of the indigenous safeguards against food scarcity and prolonged hunger periods, the farmers have devised additional growing seasons for the major staple crops of maize, cassava, and cocoyam. In the case of maize, there is a main planting season in April with crop reaching maturity in August and, a second crop planted in early September to be harvested in March of the farming year. Such steps are aimed at extending household food supply with the different harvest periods.

iv. *Additional Processing of the Food Crops*:

During this stress period, cassava and cocoyam in particular assumed additional importance in the local economy as valuable reserve crops and as reliable year-round source of calories. By their ability to increase the caloric yield and extend the harvest season, both crops served to lessen the full impact of the lean season on most households (see also Annegers 1973: 256). Equally significant is the fact that some households were observed to have devised additional processing methods for the two crops to make them edible irrespective of their natural state. For example, the skins of cocoyams which under favourable conditions would be discarded were dried and later milled into a flour before being prepared at extremely hot temperatures for consumption. Other food processing strategies included the making of a local soap from the mixture of oil palm and wood ash, and also finding natural substitutes for sugar in honey (nectar).

v. *Population dispersion*:

Population dispersion to relieve pressure on scarce resources took several forms. Some migrants from Northern Ghana employed in the Ayirebi community as wage labourers went back to their homeland when their services were not needed during the stress period. Also, a few local farmers migrated into the forest to live in their village huts set up close to their cultivated farmlands. A few individuals went to reside for a while with close relatives in other villages where conditions were perceived to be more favourable.

vi. *Expansion of village Exchange Networks*:

Exchange networks both at the individual household and the wider community levels intensified during the research period, as people purchased or traded crafts and other procured food items with neighbouring groups, communities and households. As certain redistributive mechanisms in the community intensified in their operation through the community ethic of sharing, gift giving and reciprocity, some households used up their stored resources of food and money to combat the economic and ecological hardships they were confronted with.

Table 1: Seasonal economic cycle of Ayirebi[1]

Period	Ecological Conditions	Productive (farming activity)	Food Cycle (Food supply)
A. January/March	Main dry season Harmattan characterize by a dry parching land wind ching land wind	Beginning of the agricultural season preparation of fields, cutting, burning & tilling of farm land of farm land	Farm food supplies partially available from previous harvest season. Cassava and Cocoyams that were left in the fields may be harvested at this time. A Second maize crop planted in early September is harvested in Feb./March
B. April/June	Main rainy season season with peak of rains in June in June	Farming activities continue with the sowing of seeds & crops at the onset of the first rains	With planting; food supplies in some households may be near exhaustion. This causes episodic food shortages beginning in late May. The relatively bean season for cultivated foodstuffs continues to August, resulting in a marked dependence on forest plants and game. Early maize pay be ready for harvest towards the end of August & helps to alleviate food shortage. Individuals may also make arts & crafts to obtain additional income for food purchases (from the relatively better-off farmers) at the local market.
C. July/August	Preharvest season Season Low rainfall in July-August and a second rainy season in Sept.-October	Farm labour increasess including weeding of fields and tending to crops begins, thus increasing the expenditures of labour on the-season in farms.	
D. Oct./December	Main harvest season Rains that began in Sept. continue into Oct.. However Nov. sees the beginning of the main dry season, continuing through December-March	Oct.-Nov. is a period of intense harvesting of foodstuffs, while the second half of the season is a period of leisure from farm work. Social gatherings and other community festivities peak. Crafts and the collection of some forest products are undertaken but their contribution to household Income and food supply is not particularly significant.	A season of relative plenty and abundance of food supplies for the community at large. The harvest permits the lavish consumption of food that accompanies the celebration of socio-religious activities. Brisk market activity as "Bedford" articulartor trucks converge on the town to cart foodstuffs away to urban centers.

1 See also Hunter (1967) and Fortes (1936).

vii. *Other.*

Generally, the emphasis was on communal rather than individual recoupment efforts. Additional communal responses to the stress on the local food situation arising from the drought and other ecological crises included: landlords and other wealthy creditors granting cash loans to affected farming households; remittances and welfare received from relatives living in other areas[1], establishment of a series of communal farms; formation of labour partnerships (that helped each other in farming duties); pooling of capital for joint ventures among some farmers; and finally, the resurrection of the village co-operative.

Discussion

This study shows that the adaptive responses of the Ayirebi farming community to drought are influenced by a set of indigenous and exogenous factors. Economic strategies involving multiple resource exploitation, alterations in established dietary patterns, and intensification of other economic or occupational activities (e.g., trade and exchange) helped households cope with the hardships associated with the impact of drought on a village economy.

A noted feature of the Ayirebi food economy is the ecology of local crop production, i.e., the production and consumption of specific ecologically-suited food crops. The increased importance of cassava and cocoyams in the research community during the stress period can be attributed to a number of factors, some of which have already been pointed out. Both crops are relatively easy and inexpensive to produce, and they serve as reliable year-round sources of calories. They grow and yield well on relatively low fertility soils. They also store well underground on farm plots. With their ability to extend the harvest season, cocoyams and cassava are largely seen as famine reserve crops. The tubers can lie dormant for several years, and, particularly cocoyams can be gathered from fallow fields, as well as springing up (naturally) underneath burnt cocoa farms. Cassava, too, can be processed into a variety of staple foods. All of the above helped make these two crops the most common staple foods in the community. Together with maize, these crops among the local

1 The specific nature of the contribution and/or remittances of the non-resident relatives to their rural kin usually takes the following forms: i) clothing - (including footwear, textiles, as well as new and used clothes); ii) money - (remittances to help kinsmen in their farm work or as kin contribution towards a family house, funeral celebration or maintenance); iii) food and health drugs - medicine, or provisions such as sugar, milk, and other imported consumer goods that may be available in the urban centres). Cash remittances, in particular, are crucial in the household farming economy because the cash so obtained can be used to hire seasonal or casual wage labourers on the farms. Most of the wage earners living outside the community, in order to make sure that their future food requests to rural kinsmen will be heeded try to remit some money to the farmers at the onset of the farming season, and also, during the harvest season. Other wage earners also provide some of their income to their rural kinsmen so that the latter can employ farm labourers to set up local farms on behalf of the urban workers.

staples were valuable in helping to minimize the full impact of the economic and ecological stresses on most Ayirebi households.

Most households were observed to alter their dietary patterns in response to changing economic and ecological conditions. When favourite or preferred foods were scarce, people tended to eat whatever was more readily available (Atsu 1984: 10). Where a farming household's food supplies were adversely affected by the drought, other avenues were open for action: the household could turn to the wild forest for supplements; make purchases from the local market; obtain additional supplies from kin relatives and friends; and/or make certain changes in the household diet to emphasize other home grown crops that are drought resistant. Also, periodic shortage or scarcity of economic goods stimulated trade and exchange as was evident by the intensive economic ties both within the community and between it and other surrounding communities.

This paper is perhaps relevant not only for the data on how the research community responds to stress, but also, for the light it may throw on past adaptations and thereby help us to interpret cultural history. The research information is probably useful in the quest for more substantive findings concerning the regularities in the relationships between environment, subsistence, and society. And, such studies of sequences of human-culture-environment relations in special economic contexts can provide us with knowledge about human adaptational options which may help illuminate the past.

Before concluding this discussion, I would like to suggest a few possible areas for future study. The Ayirebi community is not unique (see Posnansky 1980, 1984). However, the nature of the contemporary adaptation of rural communities, especially in tropical Africa, in the face of adversity remains to be demonstrated through further comparative studies of other regions. Our current ecological knowledge on tropical ecosystems and how they respond to stress is limited. There is the need to expand research for more detailed ecologically sound information on constraints to development (see Timberlake 1986). This will require the use of ecological concepts, principles and ideas to examine human activities, and to determine ways by which local populations can best meet their needs from their ecosystems (deshmukh 1987, NRC 1982).

The implications and relevance of such studies in helping to formulate a comprehensive program of self-reliance as an alternative development strategy cannot be overemphasized. As Feachem (1977: 9-10) long pointed out micro-level studies focusing on socio-environmental problems and how people respond to them are relevant for economic development in tropical Africa. Where possible, research data must be secured on the processes of adaptive solutions to the many and varied problems of fulfilling human needs and objectives within similar and dissimilar environments. The research may cover an analysis of contemporary variation and contrast in adaptive strategies, and

how such variation correlates with environmental, economic, social or political factors.

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APPENDIX I

List of Wild and Semi-domesticated Food Plants and Animals Exploited in the Ayirebi Community*

A. Food Plants:[1]

Class of food	Scientific name	Local name	Consumption
1. Roots, Stems, (including bark,	Calamus deeratus	mfia	Buds eaten either raw or cooked as. vegetables
young shoots,	Cocus nucifera	kube	"
gum, and pith)	Dioscorea praehensilis	ahabayere	Bush or forest yam cooked before eaten Elaeis guineensis abe Buds eaten raw or cooked as vegetables.
	Grewia mollis kyapotoro		Has a mucilaginous bark which is widely used in making soup.
	manihot esculenta	bankye	Roots eaten either raw or cooked
Leaves	Afzelia bella	papaonua	Leaves used as vegetables in soup
	Albizia zygia	okro	Leaves cooked and used in stew making
	Blighia sapidaakye	Provides edible oil.	
	Bombax buonopozense	akonkodie	Leaves eaten as vegetable
	Carica papaya	brofre	Contains sweet juice
	Carissa edulis	akokobesa	Leaves used in making soup & flavoring
	Ceiba petandra	onyina	Calyxes are muclilaginous and are eaten as part of soup or sauce. Also provides nectar
	Chlorophora excelsa	odum	Leaves occasionally eaten
	Colocasia esculenta	kontomire	Leaves served as vegetables
	Manihot esculenta	bankye ahaban	Leaves cooked and eaten
	Myrianthus arboreus	nyankuma	Leaves for soup
	Myrianthus libericus	nyankumanini	"
	Sterculia tragacantha	sofo	"
3. Fruits and seeds	afzelia bella papaonua	Seeds are eaten	
	Blighia sapidaakye	Seeds provide edible oil	
	Blighia unijugatus	akyebiri	Seeds also provide nectar
	Bombax buonopozense	akonkodie	Fruits eaten
	Ceiba petandra	onyina	Young fruits contain nectar
	Chrysophyllum albidum	adosoa	Pulp is eaten fresh.
	Chrysophyllum perpulchrum		atabene "
	Cocus nucifera	kube	Seeds eaten for nectar. A milk substitute (beverage) & also used as spice or condiment
	Cola gigantea	watapuo	Seeds/fruit eaten

1 See also Irvine (1961)

	Cola lateritia	watapuobene	"
	Cola nitida	bese	Seeds eaten as a stimulant
	Dialium guineensis	asenaa	Pulp of fruit may be eaten fresh. Also served as a sweet beverage
	Diospyros heudelotii	omenawabene	Fruits/seeds eaten
	Diospyros kamerunensis	omenewa	"
	Drypetes gilgiana	adwea/katrikanini	"
	Elaeis guineenis	abe	Paricarp and kernel provide oil
	Euclinia longiflora	gyaneya	Fruits eaten
	Klainedoxa gabonensis	kroma	Seeds eaten as condiment
	Landolphia owariensis	abontere	Fruit eaten
	Lannea welwitschii	kumanini	"
	Monodora tenuifolia	motokuradua	"
	Myrianthus arboreus	nyankuma	Served as beverage
	Myrianthus libericus	nyankumanini	"
	Napoleona vogelii	obua	Fruits eaten
	Raphia hookeri	adobe	Fruits eaten occasionally, Pericarp and kernel provide oil
	Sterculia tenuifolia	ohaa	Seeds eaten
	Vitex micrantha	otwentorowanini	Fruits eaten
4. Local Drink/	Bombax buonopezense	akonkodie	Fruit - a sweet beverage
Beverage	Chrysophyllum albidum	adosoa	Pulp eaten fresh or raw
	Cleistopholis patens	ngonenkyene	Water-substitute
	Cnestis ferruginea	apoose	"
	Cocus nicifera	kube	Serves as a sweet beverage, milk-substitute (coconut milk) also used as stimulant
	Dialium guineensis	asenaa	Fruit drink. Pulp eaten as sweet beverage and stimulant
	Elaeis guinenesis	abe	Palm wine
	Landolphia owariensis	abontere	A fermented drink
	Myrianthus arboreus	nyankuma	Sweet beverage
	Raphia hookeri	adobe	An alcoholic beverage; can be used together with bitters as a stimulant
	Rothmannia whitfeldi	sabode	Charred fruits used as stimulant in alcoholic beverage
	Tetrapleur tetraptera	prekese	Servea as stimulant. Also used in soups
5. Condiments, spices			
and flavor	Blighia welwitschii	akyekobiri	Leaves used to flavor soup
	Bussea occidentalis	kotoprepre	Flavoring agent
	Carrisa edulis akokobesa	Leaves used as flavoring agent in soup	
	Ceiba pentandra	onyina	Leaves, seeds - condiment or spice
	Klainodoxa gabunensis	kroma	Seeds also provide fats and oil
	Monodora myristics	wedeaba	Used as flavor in soup as well as pomade for hair
	Raphia hookery	adobe	Pericarp serves as bitter flavoring
	Sterculia rhinopetala	wawabima	Condiment/spice
	Tetrapleura tetraptera	prekese	Fruits as flavor in soup.

B. Forest Animals Exploited as Game:[1]

Series	Scientific name	Local name	Comment
I. Mammals			
A. Primata			
1. Mona monkey	Cercopithecus mona	okwakuo	
B. Carnivora			
1. Dwarf mongoose	Herpestes sanguineus	kokobo	
2. Marsh mongoose	Atilax paludinosus	odompo	
C. Rodentia			
1. Crested porcupine	Hystrix spp.	kotoko	
2. Brush-tailed porcupine	Atherurus africanus	apese	
3 Ground Squirrels	Xerus spp amoakua		
4. Giant rat (Pouched rat)	Cricetomys gambianus	okisi	
5. Grasscutter	Thryonomys swinderianus	akrantee	
D. Artiodacyla			
1. Roan antelope	Hippotragus equinus	okoo	
2. Giant forest hog	Hylochoerus meinert-zhagenei	ebie	
3. Bushbuk	Tragelaphus scriptus	owansan	
4. Kob	Kobus kob ofrotie		
5. Royal antelope	Neotragus pygamaeus	adowa	
6. Yellow-backed duiker	Cephalophus silvicultor	okwanduo	
7. Blakc duiker	Cephalophus niger	ewio	
8. Bay duiker	Cephalophus dorsalis	odabo	
9. Maxwell duiker	Cephalophus maxwelli	otwe	
10. Grey duiker	Sylvicarpa grimmia	saratwe	
E. Hydracoidea			
1. Grey bear	Dendrohyrax arboreus	owea	
F. Lagomorphia			
1. Togo hare	Lepus capensis	adanko	now mostly domesticated

1 See Department of Game and Wild Life Bulletin, Act 1962. Accra, Ghana.

Series	Scientific name	Local name	Comment
II. Reptiles			
A. Lacertilla			
1. Nile monitor	Veranus niloticus	Omampam	
2. Bosc's monitor	Veranus exanthematicus	omampamtia	
B. Chelonia			
1. Bell's hinged tortoise	Kinixys belliana	akyekyere	May be found domesticated in some homes
2. Common hinged tortoise	Kinixis spp	akyekyere	
III. Birds			
A. Psittacidae			
1. All parrots		akoo/ekoo	Were commonly exploited in the past. A few are domesticated now
B. Phasianidae			
1. Bush fowl	Francolinus Spp	Akokohwedee	
2. Guinea fowl	Numida meleagris Guthera	akomfem	
C. Columbidae			
1. Doves and pigeons		aburoburo	Scarce now but were commonly hunted in the past
D. Ploceidae			
1. Mannikins, bishop birds, fire finches, whydah, canaries		akasonoma	Scarce today