FIRING PATTERNS

IN THE KADE AREA

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by

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and

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With Notes and Tabulation

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by

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I. INTRODUCTION

This study, which relates to food farming in the forest, is the last of four which attempt to describe distinct aspects of the agricultural economy of Ghana, notably commercial, food and cocoa farming in the forest, commercial and subsistence food farming in the savanna areas. The other studies are those relating to Ejura (commercial food production in the savanna), West Ashanti (cocoa) and Frafra (subsistence food production). Each of these investigations has as its main goal the study of one of these aspects. It might seem that the results are of purely technical or economic interest and have little contribution to make to the major problems of government and government policy in Ghana or in Africa. Whether one can take that viewpoint or not depends both on one's tradition and training and on the acceptance or rejection of the general importance of the rural and agrarian structure as a foundation of political as well as economic wellbeing; and anyone who is now watching the struggle of European countries to reconcile conflicting agricultural interests for the sake of greater political unity could, when all is said and done, only come to one conclusion on that topic. However that may be, this writer was brought up to believe in the fundamental importance of agriculture for the economic well-being of his country and had the fortune to work in a tradition that believes that the only way properly to investigate is to observe in realistic detail the problem with which one is dealing and, only after long and careful association with that problem to elaborate standards of judgment on which both agricultural and more general economic policy could then be soundly based. This approach rejects hasty conclusions and doctrinaire policy, even if that policy is based on plausible statistical information, and the more plausible the more suspect.

If, assuming good faith, those associated for example with the cocoa industry, both sellers but also buyers took sufficient pains to assess the factors determining the prospects of production in each year, wide fluctuations in prices from month to month could not occur. The peoples of Africa of all races are paying a heavy price for such ignorance. The future and the lives of many people on the continent are being determined by the success or failure of policies based on dogma. An alternative realist approach means that the director of an investigation should work side by side as it were with those whose efforts he is directing. The need for careful observation and recording was a contribution that P.W. Smallfield made to the training of those who worked under his direction, including the assignments that he gave to a junior economist of his staff a number of years ago.

There are those who may question the validity of the conclusions of the survey which follows. They may find them to be contrary to generally accepted opinion or may feel that conditions are variable so that no generally valid conclusion is possible at all. It is difficult to accept unexpected conclusions when they run counter to short run trends but, granted that the information collected and observed is accurate, and the way in which each element in the structure fits in with each other element leaves little doubt on this score, the real question which has to be answered is whether it would have been possible on the basis of the available information to have arrived at any other conclusion than those which in fact have been formulated.

A little further reflection will show that a closer knowledge of agricultural, economic and anthropological problems would have shown the price to be paid for certain political decisions even if it would not have changed those decisions themselves. There may for example have been no way of convincing interested African governments, who are concerned with getting the maximum advantage from the struggle for positions of leadership within their country and in the continent as a whole, that it is necessary to have a certain unifying influence, even if only largesse to be continually distributed, to bring very different tribes and regions together successfully and without much strife.

If that is the case, then the only admissible approach to the problems of the continent is one of feelings of compassion for all concerned before the inevitability of tragedy. But one cannot leave the matter there for one is then haunted by the feeling that neither the African nor those who are trying to aid him in solving the immediate problems realize the full consequences of their actions.

In order to make this point, it is only necessary to accept certain simple principles of economic organisation. One of these is that the degree to which an economy can centralise is limited by the resources of that country rather than the reverse. Out of these resources, a country constructs an administration communications, instruction in a common language and those continuing contacts which tie different regions together and lead to some understanding of the needs of each. This unity is built by leadership in different sectors of the economy bound together by common interest. A topical question concerns the provision of this leadership on a permanent basis in the long period of change. For example, if it takes £15 m to maintain a stable Katangan administration, would it not require £75 m to do the same for the Congo as a whole? Looking beyond the frontiers of Ghana, it is no solution to the instability of a strife torn country to include within its frontiers additional areas of instability. If the economic history of Europe teaches anything, it is that when internal strife reaches a certain point as an economy collapses, there is no alternative but to go back to smaller units of government and start to build up again from below. The resources for centralization have in Ghana been provided above all by the cocoa industry; in the Congo by an alien economic development. But a close study of agricultural structure would also show that there are regional differences in the kind of political and economic structure that is possible. It is significant that Katanga has resisted longest the attempt to bring it within a unitary Congo, for its needs are different from any other former province. Here there was little development of indigenous commercial agriculture. Formerly, it was a sparsely settled area with vast almost empty spaces and the food requirements of the centres of population have been obtained from large estate farms and from the production of settlers. If these go, who will feed the towns?

In order to obtain the psychological background to this situation as it is developing, one has to have some appreciation of the attitude of tribal groups to land and property, and to government. There are three principal ways in which a tribe may acquire land. By discovery and first occupation, by conquest and indirectly by labour. Those who conquer an area and those who create a permanent sign of occupation on the land by their labour have a right to the occupation of the land. A logical reaction by a tribe which wishes to reassert its claim to land lost through conquest and settlement would be to destroy the improvement made by the previous occupant, which constituted a right to the use of the land. Now it is clear that in this sense an abrogation of conquest and the right of sovereignty on the part of those who had conquered and settled the land would lead those who wished to re-establish an original title to land to seek to dispossess the settler. The settler would then have no part in the new society and, added to fears of intertribal fighting and a depleted administration, he would of course find little reason for confidence in the future.

Happily this situation does not apply to Ghana. But the general problem of agricultural development is nevertheless present. At the moment, the desire for economic development is met by the using up of reserves of forest fertility by labour saving forms of farming which give the greatest emphasis to maize. But this cannot continue indefinitely and immense projects such as the Volta river scheme, though they support present levels of prosperity by injection of foreign loans, pose fundamental problems of economic structure and of a land policy designed to conserve resources. How is the urban and industrial labour force to be supported on the basis of an agriculture which is visibly deteriorating, in which requirements will soon increase and how, on this basis, are the industries to come into being which will use the power thus created? Instead of facing this problem, governments are living in the hope of some dramatic change in the rate of development which will come from exhausting or destroying existing forms of wealth in agriculture and mining, in which they have a real advantage, in order to construct large scale industries in which they have none. If schemes such as the Volta are to succeed, we shall doubtless see here as in other countries that massive interference at one point will lead to the need for massive interference elsewhere and this would mean the introduction

of capital using highly managed estate forms of agriculture; it would mean exactly the type of economic structure that had been created in the Congo. The choice has to be made: either deciding to build in the meantime more modestly and from below or putting traditional attitudes and extreme nationalism on one side and create a level of economic development with outside help that must be lop-sided and partial.

The four surveys undertaken, started in the atmosphere of expansion into new areas characterized by the Ejura survey, ran into problems of methods of establishment due to a feverish impulse to clear in the West Ashanti cocoa survey and, in the survey undertaken at Kade, saw the first effects of excessive urban development The economic position of the cocoa farmer had deteriorated as the desire for change and state control spread. In parallel fashion, the Frafra survey in the north showed how government and economic policy have affected this more isolated area. The whole is therefore a record of a society in transition at a very important period in its development just prior to and after independence. Towards the end one has to admit, and a colleague who studied in the allied field of trade had similar feelings, that it was very difficult to arrive at the truth of any situation for the suspicion that existed fairly generally towards outside investigation. One had the feeling that those associated with economic life and in particular cocoa production were always looking over their shoulder as it were to assess the effect of what they said on their own security. Surrounded by hidden truth in this way, where every statement was judged by its prestige effect in creating an appearance of progress on all fronts, one had very strongly the impression of an industry which was, in terms of one of Chesterton's phrases, of the wrong shape. Again one has, like Chesterton, the feeling that ouf of a situation which is of the wrong shape, where the elements do not fit together, only evil can come.

That is not of course the whole picture and it is with the greatest pleasure that one desires to pay tribute to the excellent co-operation given by farmers who helped in the surveys over a period of years. Amongst each group, there emerged some who became trusted friends as well as collaborators and the overwhelming feeling that one has in proferring any general criticism is that of rising in defence of their interests, as of those of the workers whom they employ. Much of the worth of the studies, if worth there be, is due to their experience which was drawn upon and the observations that they were able to confirm or deny. To the good humour and sense of fun of the farmers as a whole and to the individual merits of men such as Malam Amadu at Ejura, Kwasi Atobrah of Mim, Ayanga, Akologo, Anamu Attia and Anolozugu at Zuarungu and the seven Bongo farmers in general, for their dignity as well as their good humour, and to Kwasi Kae and others at Otumi and Subi, one wishes to pay the highest tribute. It is similarly a great pleasure to pay tribute to the loyal and most willing service given by the research assistants engaged on the various surveys. Mr. S.K. Nodzievor was always a tower of strength and the high quality of his work can be judged by his written contribution to the northern survey which only needed small editorial changes and rearrangements to appear in its present form. He was most ably seconded by Mr. J.K. Jecty, always willing to lend a hand to others without stint or the thought of immediate reward, always honest and straightforward in his judgements of people and things, intelligent, with a retentive memory and keen powers of observation; he was the ideal person to get a survey under way in the field, keep a general eye on its progress and lend a hand on the more intricate aspects. Finally, Mr. Quao has proved a very neat and tidy worker who has turned in a most competent and intelligent background description of the area where he worked for nearly two years. He had a pride in his job which it was pleasant to note.

Looking back, it is surely on the basis of these person to person contacts involving close association over quite a number of years that the real pleasure derives from work in another country; and one has the feeling that contacts made or aid given on this sort of basis are the only contact or help that in the long run are worthwhile in the highest sense of that term and, in the present condition of the countries needing help, encouragement and advice, the second best simply will not do.

II. MIXED FOOD AND COCOA FARMING IN THE FOREST AREA.

One purpose of the survey of 23 farmers in the villages of Otumi and Subi was to throw further light on some aspects of forest farming which were touched on but not sufficiently dealt with in a previous survey of cocoa farming in West Ashanti. In general, the emphasis was to be placed on food farming in this case as it was on cocoa farming in the other, but the survey became so involved in the general changes in the structure of the major activities in Ghanaian farming that the original plan was not strictly followed as will be seen in the following pages. The farmers in the area near Kade find a ready market for foodstuffs in the nearby mining enterprises and this means that Kade is not a source of foodstuffs for the major urban markets. In addition, there are such fundamental changes taking place in Ghana agriculture that the survey became quickly involved with the rate and implications of change.

The changes concern structural elements in the Ghanaian economy, notably the distribution of labour between agriculture and other employment, the relationship between production trends and prices of cocoa and of food crops; and the implications of technical change on the farm, both as regards present and future levels of production. In order to put Kade in perspective in these respects, it is necessary to add that the farms are not as large as in West Ashanti nor probably as in other major cocoa producing areas in the past As distinct from these, they are small family farms comprising cocoa and food crops. In Otumi, the annual clearing of food farms amounts to a few acres and the total acreage of farms from which crops were taken in any one year varied from 3½ to 12 acres. That is to say a farmer rarely did work on or took crops from a farm that was more than three years old. Cocoa farms in the village varied in size from two or three acres to nearly twenty acres with an average of six to seven acres. The individual plots are usually small and of less than 5 acres, though a farmer may have several small cocoa plots. Three or four farmers (one outside the village area) had larger plots of 10 to 20 acres. Only one or two farms were over 15 years old in 1958. In Subi, annual clearings were much larger, sometimes reaching 40 acres.

While the farms are essentially small, the farmers require hired labour for the initial clearings. This has considerably significance for it shows that in modern Ghana it is very rare to find a self-contained farm. This situation reflects another underlying feature of the rural economy, notably the disappearance from the farm labour force of those young men who could be expected in other countries to bear the heaviest burden of farm work. If young men are to be seen in farming villages, they will doubtless be found lounging about talking or playing draughts. For the rest, there is considerable emigration. The situation shows up most clearly in Otumi, the more remote village. The estimated distribution of population there was as follows:

	Males	Females	Total
0 - 15 years	274	280	504
16 - 45 "	141	180	321
Over 45 "	55	60	115

The extent to which the direction of farming work depends on the old men and women makes one wonder where the next farming generation is to come from when the present is too old to farm. These considerations, in conjunction with the fact that a substantial proportion of the cocoa of the country is harvested by labourers from other territories show that Ghana is not a country rich in manpower. Should the present sources of hired labour dry up either because the labourer finds some other employment, or the farmers find themselves economically no longer in a position to hire labour as before for the key operations, then a serious situation would have arisen.

In the recent past, as observed by Mr. Quao, the assistant who was concerned for the greater part of the survey with the collection of field information, these communities were quite isolated. Their system of communication and exchange was dependent not on organised markets, but on the traffic

which took place by foot on the forest paths and surplus food crops were sold, as in Ashanti, to travellers passing by. Logs of timber were hauled on sledges to the nearest road and only recently has a bridge been constructed across the Birim, so that uninterrupted access is provided to Accra, 80 miles to the south. Until recently, one could still find near Kade a village which could only be reached on foot and was dependent on the small quantity of surplus foodstuffs it could sell or exchange for the most urgent bought provisions. The road which runs though Otumi and Subi connects no major centres and this has made them relatively quiet backwaters in the stream of commerce.

While in both villages, farming depends on family labour except for clearing food farms and harvesting cocoa, there is an important difference between these two villages, only six or seven miles apart, a difference which highlights some of the immediate problems of agriculture in Ghana. The people in Otumi depend mainly on cocoa, plantain, cocoyam, cassava and yam though maize is of course planted. Twelve farmers operating on 36 farm plots scattered over the village lands and sometimes miles apart gave information. Of these farms, 21 contained maize, planted before the other crops and 15 did not. Only one plot of 2.28 acres was planted to a pure maize stand. In Subi however, maize is the main cash crop. In place of the forest and cocoa which surround Otumi, the vegetation is degraded and farmers seek each year larger areas of land to clear as forest trees disappear and yields begin to fall. One is reminded of the destruction of forest in new areas in an attempt to establish cocoa farms, with plantain and cocoyam as by-products. This process is grinding to a halt because farmers have no longer the cash to contemplate extension onto new lands and because those new lands, except in hilly areas and isolated regions in the far west of the country, have disappeared. It follows that the supply of plantain and cocoyam to the markets is becoming scarcer and this in itself will mean a serious structural change in patterns of supply. It also follows that the distinction between Otumi and Subi brings into the open a change in the emphasis of Ghanaian farming, a change which is creating areas of what will be derelict land around the main centres of population. In the meantime, maize farming brings greater production at lower labour cost, releasing labour from food farming to other rural and to urban activities; but at a cost in mortgaging present resources.

In many respects, a similar situation seems to have arisen in cocoa farming. In consequence of the planting of large areas of new cocoa in a north westerly direction across the forest belt and in consequence of the reduction of shade and the introduction of spraying against capsid, cocoa production has in the last few years shown a rising tendency after many years of stagnation. The climate of political independence has predisposed people to assume that the introduction of modern techniques along with a modern political system will result in lasting economic benefit. This tendency has been encouraged by those research workers who looked at agricultural progress from a technical viewpoint. There have been too many technical advisers in Ghana and too few farmers. The main point is that those who prophesied large increases in yield for very little expenditure of effort, in defiance of general experience in agriculture, did not stop to ask whether the change might be a temporary increase in yield at the expense of the future, which is what one would expect in deteriorating economic conditions of stationary prices and increasing wages. Technical changes which have stimulated immediate production at the expense of the tree have coincided with what the farmer would have tried to do anyway in deteriorating economic conditions.

The dangers of the purely technical approach are immense and an illustration has occurred very early in the analysis of the field work in this survey. It is desirable to compare the returns from different crops in order to know which are the most profitable and, in the conditions of food crops in the forest, this is a most difficult task. Plantains and cocoyams are harvested all the year round, as required for consumption and sale incidentally to other visits to a farm; even maize is harvested over a period. The consequence is that it is extremely difficult to obtain effective yields, especially of root crops such as cocoyams. On the basis of early attempts to estimate yields by taking plots of 1/100 of an acre, it would have appeared that yields of cocoyams should be 3½ tons per acre.

Yet experience in another survey, that on yams at Bjura, has confirmed that commonly accepted yields are too high, and the same is true for maize in both surveys. The consequence of such a yield is illogical for it would entail an astronomic return to a man who grew cocoyams near a market. The price of a 120 lbs bag on an urban market such as Kumasi in the last few years has been within the central price range of 20 to 25/- though it could be only one half of this in the more remote areas of supply. Generally, one would expect a farm price of 15/- to 16/-. This would represent a price of £14 per ton and a return per acre of £50. The family income from farming as a whole, the known yield fro other staples, in particular from maize & plantain and a comparison of family consumption and sales with the area under different crops makes such a yield unacceptable. More will be said about this later.

It is of course axiomatic that great care should be taken in cross checking yields from research activities and, when results reach levels that are two or three times higher than elsewhere recorded or when experiments prove too much - as when a tree restored to vigour produces more than one that has never been other than robust - then those results are indeed suspect. It is equally necessary to understand both the permanence of and the reasons for any change in yields. Cross fertilisation of ideas between research stations and farmers is essential in this respect. Here as in farm development one will have an adequate idea of the strength of any trend only by looking at the condition of permanent assets. This means taking into consideration in a country of shifting cultivation the state of reserves of forest land for farming and, within the cocoa industry, the strength, vigour and age of farms.

This requires more than a complicated sampling approach involving great problems of supervision. It requires not a statistical description based purely on the age of trees, or on recorded present levels of production, but rather a description and analysis of production trends based on area, location, condition of farms in districts of increasing, decreasing or constant yield, on labour supply and farm management practice with regard to harvesting and maintenance. This calls for intimate first hand experience consciously built up by a systematic appraisal of the prospects and conditions of each producing region in turn. Such an appraisal is formed first of all on the basis of systematic field notes of officers travelling through areas on business and on extension work. Only with such information to hand is it possible to built up a statistical frame designed to give an adequate preview of a season's prospects. Based on experience in other countries, an attempt is made here to indicate the type of information required and this is done in full knowledge that a part-time acquaintance with an industry built up over a period of only six years will be an inadequate basis of experience for satisfactory accuracy in judgement. But that is not the point; right or wrong as the general assessment may be, it is the approach which one wishes to exemplify:

Notes on a Voyage through Cocoa growing Areas

2 August - 17 August, 1961.

The general impression of this journey through the major cocoa areas was of most disturbing deterioration continuing at an accelerated rate the trend already noticed within the last three years. Primarily, one has the feeling that trees are being encouraged to bear at a level above a capacity which is compatible with longer term survival. With small notable exceptions at Miawso on the Teppa-Kunso road and near Bibiani, all trees seem to lack the quality of robust health, even though many which otherwise appear in a poor state of vigour and neglect have many pods. Poor unshaded trees of poor structure noted as carrying a heavy potential yield. Correspondingly, many of the best farms, well cared for and constituting what one might call good second class cocoa, do not this year have any cocoa on at all. The second impression is the dying back on all cocoa that is sufficiently vigorous to show this effect. The extent varies from complete collapse and death to withering of the twig ends so that the cocoa has the appearance of a broom. It may not be an exaggeration to say that one third of the normal cocoa foliage in West Ashanti has disappeared in this fashion this year. To this almost universal effect on young cocoa (the area around Konongo on the main Kumasi road is an exception, as is the cocoa on the Mampong scarp going to the north) has to be added a greatly increased rate of

mortality on old and diseased cocoa. Add to this neglect of farms through loss of labour and lower profits and one has a picture of an industry which in certain areas is in a state of degradation. If the present rate of deterioratio n should continue, I do not think it an exaggeration to anticipate the disappearance of the industry in major areas. In the immediate future, much depends on the extent of the trend to labour saving forms of maize farming and the amount of time given to minor season cropping (which may well decline in an unfavourable season, so that labour is available for greater thoroughness in harvesting cocoa). High prices for food in towns also force underemployed labour back to the farms. The crisis of confidence is increased by the delay in dealing with the money invested by farmers in disbanded co-operatives. One is told and has the impression that labourers have drifted away and the cocoa farms are neglected to a notable extent. The condition of cocoa in such areas is deplorable. On one important road, it was estimated that one half the cocoa seen was dead, dying or so patchy that one could not count on its long survival (area behind Kenyasi on the way to Atroni). If one drew a line from Goaso to Hwidiem and Bechem, all the cocoa west seems on its way out except for some that is grown under heavy shade around Dormaa and small patches elsewhere (e.g. near Kenyasi Mohu).

The other general comment that one might make is that even cocoa which is bearing well and is well looked after seems to have been wrongly established for it is in the main spindly with a thin canopy and the leaf colour is light green where it is not beginning to turn towards the yellow. Is the cocoa being shocked into higher yields than it should give by too much exposure, struggling for survival? The day to day atmosphere of this voyage is best given in an extract from the notes.

"Monday afternoon.- Walked with Nodzievor over the track "leading from Nkaseim towards Mim. Passed at first through the same "story of old patchy neglected cocoa, some trees bearing many pods. "The young cocoa which one reaches after two or three miles' walking "on this road is in deplorable condition and here as all over the area, "farmers seem to have decided that there is more to be got from timber "milling than from cocoa and one sees young trees pushed over by tracks "made for milling, and also trees felled across the cocoa. Of course, "overgrown farms are found here too as one had seen on Sunday when we "were able to make a detour in the bus from Mim Mohu along a timber "milling road; recalls those miles of abandoned cocoa on the roads "running in from Gambia. What one notices in the newly planted areas "is the extent of grassy weeds among the plantains. Small sized cocoa "fields are often in better conditions than others when they are sur- "rounded by forest. Compare the vast senseless destruction that is "going on in the Sefwi Wiawso area in from Datano.

"Tuesday 15th August: Goaso-Kunso-Mpasatia-Bibiani.- The "young cocoa here as elsewhere on the trip is found to be dying back. "Generally, one has the impression that the trees are being forced "and therefore their life is shortened. High yields preceded swollen "shoot; is the same happening now? Everywhere, the cocoa is worse than "at the end of the dry season. The only robust cocoa seen on this day's "travel continues to be that about half way along the Teppa-Kunso road. "At both ends of this road, there has been astonishing deterioration in "the last four months. The robust cocoa is heavily shaded and on slopes. "There is not a great deal of yield on it, but the trunks are solid, "leafy growth is in proportion to the size of the tree and it is a "healthy dark green in colour. It is a joy to see these trees against "such a background. Especially the cocoa towards Kunso is unrecognis- "able.

"Tuesday afternoon: Mpasatia-Bibiani.- The cocoa along the "road is not at all remarkable: some dead patches and not much brushing "to be seen. We took the opportunity of driving along a new cocoa road "- a private road belonging to the farmers which runstowards the west "for a number of miles, about 5 miles or so south from Mpasatia. The "cocoa here is grown with even less shade than in Ahafo. There are "simply no trees for shade. The land is flat, the cocoa partially or

"or completely dead; except that at the end of the road, which is "about 20 years old. Very little food farming here. One feels "at this stage that the journey is becoming a nightmare with "ghostly men moving around their ghostly farms. Mismanagement and "inconsistent uninformed policy towards the cocoa industry!

Wednesday 16th August (morning): Bibiani-Tanodumasi:- The best "proof of the poor state of most of the cocoa is to be found in the "very excellent cocoa of high yield near Bibiani on slopes behind the "town. It looks better than that found on cocoa stations: beautifully "shaped trees growing under moderate shade, solid trunks, deep leaf "colour, excellent canopy, complete absence of weeds and uniformly "high yield on the trees. But further along the road, the cocoa is "much as one finds at Kade, that is neither good nor bad. Much "weedy cocoa which one claims that it does not pay to weed (at present "prices?).

"Wednesday afternoon.- We left the Bibiani-Kumasi road at "mile 49 from Kumasi and went on a private timber road for 15 miles. "After 7 to 8 miles, this is very nearly continuous cocoa: no trees, "no food crops, no alternative occupation. The cocoa is planted as "though it were coffee in a plantation. In view of this, it is in "much better state than one might expect, although the degree of "growth for cocoa that is apparently up to 20 years old could not be "called good. Some farms are abandoned, others in bad condition, but "most are brushed."

The trends noted here have crept into the cocoa of the eastern region south to Oda, Kibi and Asamankese. One wonders what the position will be by the end of the next dry season (March 1962). . . . .

Probably the methods of farmers have never met wholeheartedly with the approval of the agronomist and one hears from time to time complaints about the methods of establishment and fears also expressed for the adequacy of future supplies of land for food farming, but whatever the situation in the more remote past, all the evidence that this writer has observed in West Ashanti supports the view that farmers give less care in the first year of establishment and subsequently farms are left unattended. Regular annual brushing is neglected The features of clearings in 1960-61 have been the complete felling of the forest the planting of large areas of maize and horticultural crops, the thin planting and struggling growth of the cover crops for cocoa and the early invasion of grassy weeds among the young cocoa. Various elements here are tied together: the desire to plant cash crops to be harvested in the first year entails a more thorough clearing of the land which creates harder conditions for the cocoa that is to follow. Clean clearing of this type if also typical of contract labour which undertakes the establishment of a young farm in the absence of careful supervision by the farmer himself. Whichever way one looks at the picture, there is indication of less care and attention. It is also possible that farmers noting the higher yields that may be obtained from shade reduction have attempted to force young trees into heavier bearing by this means.

Whatever the relative weight of the different considerations, and of course the speculative element of land grabbing is not absent, there is no doubt that the ultimate effect of this system of planting is deleterious to all cocoa and indeed all purely forest crops. By reduction of shelter, elimination of large trees and exposure of the soil, humidity and fertility are lowered so that there is a general decline in vigour, which drought has only brought as it were to the surface. The visible signs of decline, apart from the early abandonment of holdings which fail to establish, are a change in leaf colour, thinning of canopy, encroachment of weeds, defoliation (in a drought year), insect attack and final collapse, so sudden in 1961 that farms are left completely dead without regrowth having time decently to cover the tracery left by trunk, branches, twigs and dead cocoa pods. Shelter, the gradual elimination of unwanted high shade and the replacement by cocoa of the medium layer of forest growth so that the soil is exposed to the minimum, these seem to be the requirements for the establisment of good cocoa. The observance of these desiderata depends on research to determine the extent and timing of the process of replacement of high trees

and intermediate shade by cocoa and other crops. But there is also little doubt that in some areas a period of re-afforestation may be required to re-establish the initial conditions for successful establishment of cocoa, plantain and cocoyam. In such a programme of re-development, very careful attention will have to be given to the activities of timber companies and the siting of roads; for there is little doubt that the speed of opening up of forests has been determined by the provision of access to such wide areas that farmers have been confirmed in their unwanted haste to clear the remaining areas of forest.

Once decline sets in, the process is cumulative. If shade reduction goes too far so that the tree crops are harmed, then the farmer can less afford to carry out the extra expenditure involved in maintenance (£1 per acre for a weeding or spraying) and, in so far as extensive clearing for cocoa in vast areas at one time both pushes back the land available for food farming and exaggerates the effects of drought , then labourers will find it difficult to obtain food and the supply of extra-territorial labour to the purely commercial cocoa farmer will decline. In fact, tendencies in these directions have been reinforced both by late payment to cocoa farmers and by change in the system of seasonal advances. In the important area of West Ashanti, it is evident from the increase in labour absorbed by timber milling operations and by palm wine distilleries that there has been a diversion of activity from cocoa. It is not difficult to see, in the absence of bustle and stir in villages that one has known for years, in the small number of farm labourers to be seen making their way to and from farms in the morning and the evening and in the women brushing farms with children on their backs, that there has been a decline in the farm labour force. But it is impossible to give any precise estimate of such decline, which represents in great part a fall in extension and maintenance of farms.

Amidst exhortations, meetings and campaigns to persuade farmers to produce expanding quantities of produce, it is necessary to insist that the capacity of an industry is determined by such basic considerations as the amount of labour which is available and the amount of work it is able to do. No doubt there is some excess of under-utilised labour in Ghana agriculture which would be more fully employed if production expands, or if labourers move away to other occupations; but this excess is more strictly located in the peasant family pattern of farming than in that which employs large amounts of hired labour,,and even in the peasant farming pattern, superabundant supplies of labour appear only in the less busy moments of the year. Amongst other things, this means that for the large commercial farmer, the labour force that he has determines in a clear cut fashion the crop that he is able to produce; variations will occur in the amount produced from a given labour force rather in diversion from other activities, food farming for example, or by changes in the length of employment than from changes in the intensity of work in a given period. It may be possible for a while to achieve greater levels of output as yields increase from below normal levels; yet increased efficiency from this source will disappear and then it will be substantially true that, for an industry as a whole, a given labour force may produce more in the present only by neglecting improvement and maintenance activities; or it may be able to harvest more if the harvesting season extends over a longer period in any one year. But, taken over a normal year, more production requires a greater amount of labour and that should be as true of cocoa farming as of other occupations. Indeed, it is this fact as much as any other which makes any change beyond a certain limit, a change from year to year of say 50 percent in a major industry entirely unplausible in ordinary circumstances. Thus, for example, if it is accepted that an abusa can harvest forty to fifty loads of cocoa in a season, his actual gross receipts with a payout of £2.14/-, a load will be one third of £120 or £40. This is not better than the wages of an annual farm labourer and is inferior to the wage of an unskilled labourer working for 160 days in a year at 6/- a day.

It has been necessary to make these discursive remarks on general trends in Ghanaian agriculture both because of their intrinsic interest and to understand better the changes that have taken place during the survey in Otumi and Subi farming. For just as the extreme changes which have taken place on farms in recent years make it possible to understand more fully the more subtle trends that one is able to note on the West African Cocoa Research Institute station, so the changes in Ghana agriculture as a whole make it easier to understand those in a small sector of that agriculture. In general, one may say that trends within the Kade area repeat in a milder and possibly retarded form those which have been

occurring on a larger scale in the country as a whole. First in respect of cocoa, production has been influenced in both villages by the failure of farms, under attack from capsid, to develop as expected; but, whereas in Subi this setback was followed by abandonment of cocoa in favour of maize and rice as cash crops, in Otumi farmers put their cocoa into bush and were encouraged to reclaim it on account of the improvement of prices in post war years, followed more recently by the proved success of spraying. Mr. Nodzievor describes a case where three men undertook to redeem a farm over a maximum period of six years, taking all the foodstuffs in the first period and one half during the second. In Subi, an alternative profitable pattern of farming has been found, but one which quickly destroys the forest and exposes crops, especially plantains, to drought and wind damage. In Otumi, farmers continue to rely on cocoa as a cash crop with plantains and cocoyams as staples for family consumption - a pattern of farming which, being for the moment considerably less profitable, is much more likely to endure. Even here however, there are signs of an overhasty extension of the area under new farms in an attempt to claim land which is distant from the village; but, so far, the forest area has not suffered extensively and around the village itself, there is a band of land of some depth, perhaps a mile, which is held in reserve, including cocoa in cold storage as it were. As a consequence of the redemption of farms planted some years ago, just after the war, there has been a marked expansion of production in the last two years. Again, while signs of an increase in production are by no means lacking on the cocoa farms of the area at the expense of future vitality on exposed cocoa, the increase on the farms of Otumi is due to greater expenditure of family effort on routine operations. The fact is that farmers in the area have substantial amounts of forest surrounding their rather scattered cocoa plots and have also left on their farms moderate to heavy amounts of shade. Even if drought and capsid or other nuisance such as white thread have caused some deterioration on most holdings in the last year, the situation does not yet call for the feelings of alarm that are aroused by the condition of cocoa elsewhere.

Subi has participated in the changes in the food supply position during the past twelve months. The first indications that a shortage was possible occurred with the minor season of 1960 when there was a crop failure. As the dry hot weather continued into March 1961, it became apparent that there would be a failure of the plantain crop and prices of all foodstuffs began to rise precipitately. With the maize harvest in August, the price of this commodity returned to a more normal level and a journey throughout Ghana at this time showed that the price fall was everywhere simultaneous and to the same extent. A major fact in this fall appeared to be the very fine harvest in the North Ashanti area as well as the very extensive planting of cereals throughout the northern region. Apart from any influence exercised by the reduction in clearings, it is clear that there is a more permanent effect on plantain or cocoyam in a bad year than there is in the case of maize which may over its short growing season meet with favourable conditions. It is also clear that the order of variation of food prices, two to three hundred percent, increases and decreases is a prime mover in the present day rural economy of Ghana; for these changes are much greater than any which has taken place in export crops in the last ten years. It is also clear that, just as a favourable growing season releases labour from food farming in the long run, so a crop failure releases family (though not hired labour) for activities on cocoa.

The shortage or increasing cost of labour and of food has affected the farmers of the villages, but less than in more highly commercialised areas of the rural economy. The effects of the food shortage as noted by Mr. Jecty on one of his visits to the area were increased consumption of cassava and rice, which was not usually much consumed by the farmers. Small fingers of plantains and tiny cocoyams were consumed which would normally have been rejected, while farmers wishing to avoid losses in storage only took the food crops that they needed for a short period of one or two days. Several families were actually buying small quantities of foodstuffs at the height of the food shortage in Otumi. The increasing cost of labour has not affected the farmers in these villages to the extent experienced by farmers in more highly developed commercialised and specialised areas of cash crop production. As will be seen, this is due to the

preponderance of family labour and the relatively small reliance on hired workers. Farmers relying on family labour have reserves of manpower which can absorb substantial changes in the level of production in a major commodity by working longer on the farm and by reducing those alternative occupations which their possession of land, buildings and cash reserves may permit them to adopt. It is in areas of commercialised farming that labour shortages have first occurred. Nevertheless, Mr. Quao does report a case where a farmer had to abandon a portion of his farm in 1960. On the whole, however, farmers in these areas have not over-extended their farming operations in a desire to secure land for the future and their problems are more manageable than those for example in West Ashanti; nor are they, in the absence of local markets and stores, quite so dependent on bought provisions and services. They spend little on alcohol and education.

In detail, the effect of recent increases in wages is to make contract rates for clearing in the area more expensive. Within the last year or so, contract rates have increased by 25% while daily rated labour, at 4/- plus a meal worth 6d to 9d, tends to work four to five rather than six hours on the farm. Contract labourers on clearing work have longer working hours (7 to 8 hours), but their charges are equivalent to 6/- a day or even 10/- on tree clearing. So far, the farmer is protected by the system of share cropping from increases in the cost of harvesting his cocoa, but all other hired labour charges have effectively increased and it is in operations affected thereby that one would expect to find economy in the use of labour. Deficiencies in basic industries could alter this situation before long by arresting expansion in the main towns; but then a serious problem of re-assimilating the diverted manpower would arise.

III. THE SURVEY AREA AND THE RESULTS OF THE SURVEY

The survey was undertaken in two farming villages which lack marketing facilities except for small part-time shops and hawkers. Otumi has a central open area, where meetings are held and commerce tends to concentrate, but Subi, only a mile or two from Kade, is strung along the road and has no focus. In neither case is there provision for other than incidental exchange and produce is traded directly with Kade though a contact may be arranged with a buyer who resides in the village. Thus a dealer may arrange with a farmer to bring products on a stated day, or wives of farmers travel to Kade to sell farm produce. Subi contained 40 compounds with a population of 335, Otumi 129 compounds with a population of 740. Both villages are primarily agricultural, though at Subi there are also a number of diamond labourers. Thus of 88 males, there were 50 farmers (including 4 who were also traders) and 27 diamond labourers. In Otumi, there were a number of teachers, government servants and public works department labourers, but three quarters of the 190 employed adult males were employed in farming or as sawyers.

Kade is the marketing centre for the area and it is to Kade that cocoa is taken for storage, re-bagging from "bush" weights and grading. Local foodstuffs, fresh meat, fish and cloth are sold in the market. Imported manufactures are sold and artisans operate from shops in the town. The principal market is held twice a week. Several expatriate stores exist which, in addition to direct sales, provide smaller traders with stock at the semi-wholesale level. Kade however is not independent of other rural towns. In particular, some 20 miles nearer Accra to the south is Asamankese, which is the centre for the distribution of produce from other regions, notably fish and tomatoes to Kade and other smaller centres. Asamankese has all the types of businesses which operate in Kade and in greater number: drinking and chop bars, tailors, furniture shops and carpenters, record and bookshops, corn mills, garages; hairdressers and mechanics. In addition, it has a greater degree of specialisation. In the clothing trade, there are shops selling suiting and shirts only.

In 1958, Asamankese had more than 50 food and drink bars, more than 60 tailors and seamstresses, 27 carpenters and furniture workshops, 30 businesses selling drugs, books and records, and 24 connected with mechanical trade, corn and rice mills, garages, spare parts depots and printing presses. Service trades, hairdressers and dental clinics amounted to ten in number. The business activities of a town are related to the basic activity carried out in the home and local market and represent a refinement of food, transport, clothing and housing

requirements, supplemented by activities relating to health, education and entertainment. This fact has of course important implications for planners of economic development, as it has for the theory of consumption, for it shows that the demand for produce is in a way the inevitable consequence of the need for ways of keeping and preparing products which will avoid waste and save the time of those who have become occupied with specialised occupations and who do not have the time to harvest, transport and process the things they need to consume.

The farming pattern in the Kade area is the typical complex pattern of a forest area in Ghana. It is complex with shifting plots and an involved rotation of crop mixtures and successions which vary from plot to plot. The plots are scattered in different directions from the village. Except for a few crops, there is no precise time for harvesting, trees and logs strew the fields, varying quantities of a crop may be left unharvested; women have plots of their own and farmers follow a variety of different occupations. In consumption, game, leaves and gifts of food are eaten by the family and a high percentage of some crops such as plantain is lost in peeling. Yet it is necessary to describe briefly this most intricate pattern of activity. Individual plots under cultivation vary in size from a fraction of an acre to nearly 20 acres. The clearings of a given year vary from a family subsistence plot of an acre in the case of Otumi to 25 acres in one year in Subi. Indeed, there is one case where a man in Subi cleared in successive years 53, 38 and 20 acres (in the first half of 1961). Of this area, 73 acres were in pure stands of maize. At Otumi, farmers had an average of seven acres of foodcrops and nine acres of cocoa at any one time; in Subi, 20 acres of foodcrops and three acres of cocoa. In both villages, the greatest number of plots, if not always area of land, is planted to crop mixtures which really represent a sequence of crops from a given area. Changes are rung on maize, cassava, plantain and cocoyam (harvested in the first part of the second year) . After the plantain has been harvested for two or three years, the plot is abandoned in one kind of rotation. But, if maize farming predominates, the rotation period may be short and last only two or three years. Quao reports one pattern where maize is planted on alternate years during a six year period. It is in the last year interplanted with cassava. It is then fallowed for up to four years. Where the fallow period is longer, say 5 to 10 years, Mr. Quao reports that the rotation is one in which plantain and cocoyam dominate. Rice is planted in swampy areas and may be followed by sugar cane. Several years will pass before another crop is taken. Wives' farms, as reported by Jecty, are not large, varying usually from half an acre to two acres. Their purpose, as reported by Jecty and Quao, is mainly that of obtaining some cash for the purchase of "beads, pomades and powders" even clothing if the return is sufficient. There are three types of these farms. In one case, Jecty reports that the wife uses her own money in hiring labour for clearing and felling while the remaining operations are performed by the wife with the help of her children.

> "The income derived from this type of farm belongs entirely "to the wife, but for courtesy sake, she may either show the money to "her husband or tell him of the income derived."

Some of the crops may be harvested for the use of the household, in which case the farm acts as a buffer against famine. In a second type of farm, the husband either does the clearing and felling, or pays the cost of these operations. He may also assist in burning, stumping and gathering, but planting, weeding and harvesting are undertaken by the wife who may share some of the money with her husband. The most common type of farm however is the major season farm which is handed over after the maize harvest. The woman weeds the farm with the help of her adult children with occasional help from her husband.

> "Food crops in this type of farm are meant for household "consumption, but the surplus is sold and the income divided into "two: the husband takes half and the wive the remaining half."

The importance of wives and children in weeding second and third year farms is apparent in the records of these operations. The family labour force consists of the farmer, his wife (or wives) with some help from children. Six farmers had more than one wife, one had three. One half of the farmers employed children on their farms (numbering 28 for 23 farmers). This family labour was occasionally helped by an adult son or daughter or relative. Fifteen farmers employed from

one to three casual labourers at a time; all but one or two employed contract labour. In addition, there were 4 abusa labourers on farmers' cocoa farms.

The farming season starts during the dry season with clearing and burning operations. With the first rains at the beginning of March, planting starts. First maize, then, when the ground is soaked, plantain and cocoyam. Maize is harvested in August, so that the farming family is free in the latter part of the year to turn to cocoa harvesting. With this pattern, there is a constant activity throughout the year; the farmer and his wife going to the farms four to five times a week or some 22 days a month, with variations only during times of sickness, travel or funerals. Supplementary activities: palm wine tapping quite generally and crafts (building, sandal making, and so on) by a few, are undertaken to complete the year's activities. Otumi farmers employ labour on clearing food farms and on cocoa harvesting to an average extent of 3 months' male adult labour, Subi farmers, who are wealthier, to an extent of 6 months. Capital equipment consists of axes, cutlasses, hoes and digging chisels. The value of these implements varies from ₵1.10/- to ₵5.10/-. In addition, four farmers had cocoa sprays for which they paid ₵16, two farmers paid ₵5 and four ₵1.15/- 1).

In order to understand the significance of this pattern of farming, it is essential to obtain an adequate idea of the yields of each major crop within the rotation. For plantain and cocoyam in particular, there are various levels of approach to this matter. First, there is the spacing pattern and the number of plants found in a selected area to be harvested. Second, there is the proportion of these plants which in any given year will yield. Third, there is the actual produce from an area that a farmer finds worthwhile to harvest. Some will simply go to waste, some deteriorate and some will not reach a standard that is acceptable. There will be vast difference in results according to which of these approaches is adopted and it is the last which is the determining factor in income derived from farming. Thus, it is one thing to state that there should be 500 or 600 plantains per acre or 2500 cocoyam plants in a regular spacing yielding over one ton. It will be quite another to determine the actual number found in any acre of land in a typical Kade farm, and only a proportion will fruit. Records were taken over a long period and it was found that the number of plantain bunches harvested by farmers varied from 50 to 140 per acre for the year after planting. At 2/- a bunch, this represents an income per acre varying from ₵5 to ₵14.

The rate of consumption and the small sales of cocoyam leads one to suppose that Otumi families consumed in the vicinity of 12 tons in a year, while Subi farmers consumed and sold half this quantity. In any one year, the farmer had an average acreage of twice this yield under cocoyam mixtures and so one may assume an average harvested yield of half a ton per acre. At 16/- per bag, this represents a return per acre of ₵8 approximately. In Subi, cocoyam is planted as a pious hope following an earlier maize crop and yields are derisory; in the vicinity of 200 lbs. to the acre in which cocoyam is planted as a mixture, often with cassava as well as plantain. A major proportion of family consumption of cassava comes from wives' farms. Family consumption and sales in Otumi amount together to an estimated 14 tons per year, but only 7 acres were recorded under cassava mixtures. If one assumed that each wife had an acre under a cassava mixture, the yield would fall to under one ton to the acre. The situation is a good deal clearer at Subi. Consumption patterns and sales indicate greater reliance on cassava and a production of 27 tons in a year amongst ten farmers from an average of 40 acres under a mixture containing this crop. This means two thirds of a ton per acre or only about ₵5 per acre from cassava. To place these figures in perspective, one may recall that Otumi farmers have just over 7 acres under food crops and Subi farmers 20 acres. To check the estimate, one could calculate a rotation giving 600 lbs of maize in the first year or ₵5 an acre; eighty bunches of plantains of 25-30 fingers weighing 20-25 lbs, giving ₵8 and half a ton of cocoyam giving also ₵8 in the second year; and ₵6 for plantains in the third year, giving a gross total of ₵28 during a period in which a farm is in production. Yams and vegetables interplanted will give another ₵2-5 an acre to make ₵30-33 in all. The average return in one year

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1) Information supplied by Mr. Quao.

from an acre will be ₵10 in a time of "normal" prices. In Subi, one may suppose a rotation in which cassava is added to take the place of the smaller yield of cocoyam and, since the price of cassava is approximately one half that of cocoyam (as the potential yields would indicate), the value per acre is approximately the same on these farms on which plantain is successfully established. This substitution of cassava for cocoyam may be explained partly of course by the food shortage during the latter part of 1961. However, that is a secondary point besides the major one that the survey tends to confirm once more that the price of food crops to the farmer in Ghana, especially those of a similar labour requirement, cereals as a whole or root crops (cassava, cocoyam), is in proportion to the yield per acre. This also means that the yield per acre can be estimated backwards from the price per unit weight of a crop. Those with a bent for philosophical reasoning might then argue that this is another point in favour of the thesis that the market works efficiently to adjust price to costs. In parenthesis, husked rice yields at the rate of 336 lbs (one bag) per acre. The yield is little more than half that of maize, the profitable price somewhat more than twice as great.

This is therefore a favourable opportunity to turn to a consideration of costs involved in the major farm operations. But before doing that, some comparison with cocoa is required. Generally accepted practice amongst farmers is to divide the share from cocoa farming into three parts, one third of which is to meet the charge on capital invested. Thus, in order to have a return of ₵10 an acre, a comparable gross return of ₵15 is necessary for cocoa. One acre of cocoa equals one and a half acres of food crops. In the type of food farming which the Kade villages follow, no annual accumulation of capital invested need be considered since the whole point of the cash return from the maize crop is to defray labour expenses during the first year of the rotation and only a small amount of maintenance is needed after that. That will also be the reason why, in the case of a food farmer on a share basis, the harvest is divided into two shares rather than three, and the labour reward would remain the same. In order to obtain ₵15 from an acre of cocoa, a yield of 300 lbs of dry beans would be necessary when the price is ₵3 a load of 60 lbs and when the price is ₵2.14/-, the average yield would have to reach 350 lbs per acre. This means that, taken over bearing cocoa of 15 to 30 years, yields of as much as 450 lbs per acre would be necessary. But cocoa which yields at this level is first class cocoa, while that yielding around 300 lbs is second class and that much below 200 lbs third class cocoa. Since cocoa prices are out of line with physical yields, one finds here the reason why only first and good second class cocoa concentrated in limited areas around Anyinam, Kon ago, Wiawso and Odoben with patches near Teppa, Bibiani, Sefwi Wiawso and the Manpong scarp is holding its own, while the rest appears to deteriorate rapidly. If present policy is to hold, then only a considerable reduction in the price of foodstuffs to prevent a diversion of activity to food farming as well as a reduction in urban wages to limit the drift to the towns, would in some measure restore the balance in farming; but these logical outcomes of present policy are shocking, so that policy itself must be re-examined.

The man-hours (counting a woman 2/3 and a child ½ of a unit) required per acre for food farming depend on the size of the field and the type of rotation followed. The requirements for the two years under the Subi system, in which the forest is quickly disappearing and the vegetation open, are much less than in Otumi. Under the small plots of one to two acres surrounded by forest which characterize Otumi farming, and this is the traditional pattern, labour requirements are at least twice those at Subi and may reach three times in a year of a bad burn when there is much extra work to be done in gathering, burning debris and planting. Thus, the man-days per acre required for the large open food farms at Subi have fallen to less than twenty per acre. In Otumi, the requirements lie normally between 30 and 40 man-days and, in the poor year of 1960 when the area cleared was much reduced, the requirements rose to 50 man-days per acre. On the other hand, this was a good year for cocoa. Thus, at 4/6 to 5/- per day, the cost of cultivation is as little as ₵3.10/- to ₵4 in the one place and as much as ₵8 to ₵9, for food crops, in the other.

Subi farmers had the larger supplementary sources of income, notably ¥200 from renting houses in Kade, equal to ¥10 a family. Their income from other supplementary sources, including palm wine tapping, cocoa purchasing and spraying, timber labouring and the building trades, is greater than that of the Otumi farmers. The immediate advantages of short rotation farming at Subi are great, since yields have only just begun on certain farms to fall appreciably compared with Otumi and there is a clear cut economic reason why farming of this type is found by the farmers to be more profitable. But, the long run effects of a policy towards farming which favours annual food cropping at the expense of that system of farming which is adapted to the requirements of a forest area, are bound to call for a reappraisal. A system of food farming which is rapidly destroying both the forest reserve and with it the present system of cocoa farming is profitable for the farmer. It is not only relatively more profitable for, under the traditional pattern of plantains and cocoyams pure labour costs amount to ¥7 to ¥8 per acre for a total return of ¥10 to ¥11. The labour reward is too high in proportion to total returns, so that in a bad year the costs would exceed the returns.

If Ghana desires to save her cocoa industry, two measures are called for. One is to see that the cocoa farmer obtains a price for his crop that enables him to farm for the future and that requires greater stability in production based on the assured returns from robust farms. The other is to improve the efficiency of food production and transport, adapting the crop to the environment where it is grown. Further points are brought out by considering the particular farming operations. The great difference between the villages in the amount of time spent in cleaning up the fields for planting after the initial clearing, and in planting becomes apparent. The reasons are clear from further study. The extra time taken for cleaning, chopping, burning and stumping derives from the obstructions left on the field in Otumi farming. The much greater time taken for planting is due as well to the nature of the crops planted. In Otumi, these are almost entirely crop mixtures with an emphasis on plantain and cocoyam. In the seasons 1959-60 and 1960-61, there was only one pure stand and that was a plot of 2,3 acres of maize representing 3% of the area planted. In Subi, 254 acres were planted to pure stands: 157 acres were in maize, 6 in sugar cane and rice occupied the remaining area. The total amounted to approximately 50% of the area planted in these two years. A warning for the future is that 20 acres of this area failed. This rather than increase in weeding seems likely to limit a shortening rotation. Quao reports small maize plants on a plot used two years running. Maize is not usually weeded. The time taken for the major operations, based on a 6 hour day, is given in the table which follows:

	Otumi		Subi	
	Man-days	Proportion	Man-days	Proportion
Clearing . . .	4-8	1/9 - 2/9	3-5	1/4 - 1/6
Felling, gather. etc 1).	5-12	1/7 - 1/3	2-3	1/7
Planting 1). . .	8-12	2/9 - 1/3	3	1/6
Weeding.	5- 7	1/6	3-4	1/5 - 1/6
Harvesting . . .	5-7	1/6	6	1/3

1) Depending on success of burning.

Actually, planting up two acres with plantain, cocoyam and yams including transport and storage may take a family working without haste the best part of two months. This of course includes lifting the planting materials. An insignificant amount of time is spent on bird scaring and fencing against rodents. As mentioned above, the man-days are calculated on the basis of a six hour working day. Actually, while a day approaching 5 ½ hours was the standard when the survey opened, in the beginning of 1959, the hours spent on farming, but not on supplementary occupations such as building, have shown a falling tendency in the last year of the survey and did not even exceed 4 ½ to 5 hours, even during the more arduous periods of the year. This will make the man-days given in the table an under rather than an over-statement. If 5 hours is taken as the standard,

then forty man-days will be required by acre in Otumi and twenty in Subi.

The scheme of Otumi operations approaches quite closely the time requirements of cocoa establishment in new forest areas which were found in another survey to amount to 55 man-days per acre in the first year, allowing a longer period for weeding or brushing around the young cocoa. Approaching this matter from a different aspect leads to the conclusion that pure maize stands in the secondary bush require only 15 man-days per acre; rice requires 25 man-days and mixtures containing maize, plantain, cocoyam and another crop from 25 to 50 man-days, depending on the type of forest which is cleared. It is quite apparent that the Subi system of farming is much more economical in labour than that practised in Otumi. It maybe of interest to add that minor season August to December food farming in Subi takes up a tenth or less of time of the major season and that in Otumi, due to the greater importance of cocoa, the minor season farm receives only a week or even less of man-days labour. In the second year of a rotation, the greater part of the time is spent on harvesting the plantain, cocoyam or cassava. Some time is also spent on cleaning up the farm and, in a general way also, weeding only becomes important when semi-permanent or permanent crops are introduced into the rotation. The time spent on harvesting declines according to the records of 1960 to 1/3 and 1/5 of the previous year, while that on cleaning up the farm to one fifth and one tenth, in Otumi and Subi respectively. The shorter time spent on harvesting in the second year follows from the reduced period of rotation in the Subi area. The time spent in the second year as a whole amounts to approximately three to five weeks' work by men, women and children, or one sixth to one tenth of the labour devoted to the farm in the first year. In later years, harvesting may continue from older food farms, but they are not otherwise tendered and even the harvesting is done incidentally to nearby farming operations.

While it is true that the average labour requirements per acre were higher in Otumi in 1960 than in 1959, the time spent on food farming operations was less, due to a much diminished acreage (22 acres as against 37). The decline in labour time was from 9250 to 7100 man-hours. In Subi, hours of work also fell, due to less time spent on harvesting and stacking the poor crop of 1960, though the acreage cultivated actually increased from 229 to 293 acres. The decline was from 31800 to 25400 man-hours. The following figures show the differences from one season to the other:

Man - Hours

		Food Farms	Cocoa Farms	Other Occup.	All Activ.	Hired	Family
UMI							
	1959-60	9250	6900	1700	17850	3050	14800
	1960-61	7100	5700	2150	14950	2200	12750
BI	1959-60	31800	2500	1400	35700	6700	29000
	1960-61	25400	4400 1)	4600 2)	34400	9800	24600

1) Increase equally divided between weeding cocoa farms and harvesting.

2) Increased due to greater time spent on building and associated trades, masonry, carpentry, lumbering, sawing and palm wine tapping.

The time spent on farming operations fell in both villages, but to a greater extent, percentagewise, in Otumi than in Subi, due to a failure to get farms properly established in the second year and to a marked reduction in maintenance and redemption work on cocoa. In Subi, where cocoa is much less important the increase in time spent on that crop was made possible by the decline in time spent on food farms in the second part of the year, consequent upon a poor distribution of rain. The basic importance of food farming in determining the development of, and attention to, cocoa is apparent. The time spent on other occupations increased even more. Families spent fewer hours on their farms in 1960. This is explained to a considerable extent by a shorter working day.

According to the records of cocoa farming activities, one thing is abundantly clear, namely that Otumi farmers have spent much more time in reclaimin

lands that were planted perhaps 15 to 20 years ago, replanting, inspecting, cleaning and controlling shade. About one tenth of all time spent on cocoa farms was accounted for in this way. Subi farmers neglected these operations. In the first year of the survey, Otumi farmers spent twice as much time on brushing their farms. This adds up to a picture of redevelopment of cocoa in the Otumi area. Yet if our records are to be trusted, the yield of Subi farmers in cocoa increased more than three times from 1959-60. This is only credible on the basis of erratic factors. The time spent on harvesting increased by 60% in Otumi and by 90% in Subi (women and children are counted for half in this operation). In both villages, somewhat more time is spent on harvesting than on brushing and spraying. Only a few days are usually spent on spraying. According to the records, yields in both villages increased from 136 loads of 60 lbs in 1959-60 to 318 loads in 1960, or to 356 loads, if three farmers who dropped out from the Otumi group are included. The 136 loads required a total of 1000 man-days of labour by the farmers; the 318 loads 1360 man-days.

Further comment of a general nature is superfluous and there remains to note one or two cases in each village. Two farmers in each village dominated production. The four in 1960-61 were reported as producing three quarters of all cocoa. In 1959-60, they produced 91 loads of cocoa for 530 man-days of labour, including 320 days in harvesting. This means 2.3 man-days per load for harvesting and 6 man-days for all operations. In 1960-61, when one farmer had reduced his redevelopment operations from 108 to 40 man-days of labour, the farmers produced 255 loads for 715 man-days of labour, including 465 man-days of harvesting. Thus only 2.8 man-days were required in all and 1.8 for harvesting and the days spent on operations other than harvesting decreased by 20 percent. Since maintaining and harvesting 60 pounds yield of cocoa including, drying, fermenting and transport to the village will require a minimum of two man-days labour, these figures must represent an upper limit of efficiency in harvesting farms which may be 2 or 3 miles from a village 1). By implication over the main harvesting season a man who worked consistently could harvest 75 loads in 130 days, while the national average is usually accepted as 40 loads per man in a season. 2)

It has been noted that Otumi farmers have 7 and Subi farmers about 20 acres under food crops. Urder a traditional rotation, an acre should produce £10-£11 of foodstuffs in a year. On that basis, the average farmer would have in Otumi £70 and in Subi £200 worth of staple food products at his disposal in a year. The Otumi farmer received an average of £40 from his cocoa and £12 from the sale of food crops; other sources of income brought him £20, of which the main items were palm wine tapping, cocoa spraying (In 1959, but not 1960) and timber labour. On this basis, his annual income was £130 taken over the two years. However, since in addition to food consumption of £70, cash expenditure was at the rate of nearly £100 and expenditure on farm wages £15, the net income of the Otumi farmer may be put at £150. For the Subi farmer, one must add £35 for cocoa and £15 for kola and palm nuts. Supplementary sources of income including wage paid labour, palm wine tapping and handicrafts account for a further £30, making a total income of £280. The value of any produce from the wife's farms is not included. It would seem that families did not disclose their entire income, for there is a discrepancy between cash income and cash expenditure which amountsto perhaps £10.

Since the sale of food from Otumi farms may have been offset by the food consumed from wives' farms, we may suppose they consumed staple foodstuffs amounting to approximately £70. Subi farmers sold food products to the value of £90. Allowing for contributions from wives' farms, they consumed considerably more staple foodstuffs than farmers at Otumi, notably to a value exceeding £100.

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1) On a modern plantation in the Congo, a man could harvest up to 100 pounds of (peasant sized)cocoa pods a day and break open a similar amount the following day. Fermenting, drying and transporting the crop are excluded. INEAC, Normes de maind'oeuvre pour les travaux agricoles au Congo Belge, 1958, p. 56.

2) Beckett before the war estimated that a fully bearing farm needed 4.2 to 4.5 man-days per load, including maintenance (Akokoaso, pp. 87-8). Only in a large compact productive farm where maintenance was neglected could one get as low as 2.3 man-days per load (op. cit. p. 89).

This corresponds to families which in size are 50 percent greater than in Otumi. Taking both income and expenditure into consideration, gross cash income, excluding food consumed from the farms, ranged from ₵40 to ₵250 in Otumi with an average of ₵90 and from ₵75 to ₵400 in Subi with an average of L/180. Indebtedness amounted to ₵225 for the 23 farmers of both villages and they had given credit to the extent of ₵138. Nine loans were involved; several carried no interest for all loans except one were given by relatives and friends. Several loans had run on for some years, but one repayable within the year bore an interest of 15-20 percent.

Five families in each village agreed to give records concerning their daily consumption of food of all sorts. The families in each village used in the month of recording first of all plantains. Consumption of cocoyam and cassava taken together was higher in Subi, amounting to 1½ tons when bought food and gifts are included, as against one ton in Otumi. The measure of the food shortage during this time in Subi (due to the drought) was the quarter ton of bought staple foodstuffs.

The results show that farmers in Otumi consumed food at the rate of ₵115 a year. Of this amount, they took food from their farms at the annual rate of ₵65-₵70. During the survey period (July 1961) cocoyam was appreciably more expensive than usual . Farmers' wives accounted for it at the rate of ₵20 per ton, but they accounted for plantains at ¾d per finger instead of at 1d, so that these discrepancies, in different directions from normal prices, cancel out. Subi families spent at the annual rate of ₵125. Of this amount, an equivalent of ₵70 to ₵75 per annum came from their farms. If this is a characteristic level of consumption from their farms, then total income would be ₵240 and not ₵280 per annum. In both cases, the bulk of purchased foodstuffs comprised meat and fish at the rate of ₵3 per family for a month, including game. Since at Subi the value of game consumed represented an annual rate of ₵20, it seems that it had replaced bought meat and fish during the period, since recorded expenditure on these items for the two year period of the survey gave an annual purchase of almost exactly ₵36 in Subi and ₵32 in Otumi. The actual consumption of foodstuffs is given in the following table:

Consumption of Five Farm Families. (per month)

(pounds weight where stated - otherwise units)

	S U B I 2)			O T U M I 1)		
	From Farm	Bought	Gifts	From Farm	Bought	Gifts
Plantain	2 829 lbs	90 lbs	122 lbs	1 274 lbs	48 lbs	26 lbs
Cocoyam	545 "	4 "	80 "	1 063 "	93 "	6½ "
Cassava	1 880 "	362 "	114 "	1 019 "	183 "	12 "
Yam	7 "			42 "		
Rice		4 "			13 "	
Maize cobs	395		89	113	20	
Palm fruit	234 lbs	3 lbs	5 lbs	76 lbs		
Palm oil	1 pint	1 qt		1 qt	2½ pts	
Cocoyam leaves	51 lbs			46 lbs		
Pineapples	27		1	11		
Sugar cane		10 lbs				
Banana fingers	40			53		
Pawpaw	2					
Avocado pears	37			63		

1) 5 males, 9 females, 22 children, 2 infants. 2) 14 males, 15 females, 18 children, 3 infants.

Coconuts	5											
Okro	1 lb											
Beans	4 lbs											
Onions	1 lb		4 lbs								8 lbs	
Garden eggs	5½lbs								60 lbs			
Sakato (numbers)	20											
Tomatoes	4 lbs		4 lbs						6 lbs		20 lbs	
Oranges	5											
Red peppers	2½ "											
Mushrooms									55 lbs			
Fish			45 lbs+					)				
Meat			20 "++					)	85 "			
Bread								)				
Rock salt			4 "									
Game (value)	₦8.8.7											
Rats	23½								11			
Snails	107								107			
Antelope	½								1			
Cutting grass	1½			1					30			
Crab	14								2			
Guinea pig	3								1			
Chicken												
Bush Fowl	1											
Tortoise	3											
Squirrel	3											
Apese	1½											
Amunkwa	1											
Abrebie	1											
Pangolin	2½											
Monkey	½											

\+ worth ₦4.7.8 at 2/- lb
++ " ₦2.16/-" 3/- lb

In addition, the following were consumed;

Sub.

lb Sugar cane 6d, 3½ lbs konkonte 1/- 4 lbs rock salt 9d, groundnut and cowpeas 1/8 ~~were also consumed~~

Otumi

Garri 2 lbs, groundnuts 1 lb, cowpeas ½lb, garden eggs 1 lb, 5 lbs porridge 1/1, 2 lbs konkonte 4/3, 5 lbs peppers 1/2, 6½ lbs monkey 2/3, 25 lbs sugar cane 1/4 1½ lbs salt, paprica 4d, chop ber 1/-.

It may be that food production in Subi already does not reach the expected standard of £10 an acre due to a decline in yields for the total value of food consumed and sold, according to the results of the month's recording, would be £165 or £8.5/- per acre. On this basis, annual income in Subi must be reduced to £245 or say £250. That a decline has set in is evident. Thus, one very large annual clearing insufficiently protected by surrounding forest gave a gross return for maize and a small amount of cassava of the order of £4 per acre. The return was therefore not greater than another farmer could get from less than half the area. It is disturbing to discover this tendency in a country where the trend of farming is in the Subi direction while population is rising rapidly. On the amended tables of annual income, food consumption represents 69% of income in Otumi and 50% in Subi.

Nineteen farmers provided information on their possessions, but we were not successful in persuading the women to do likewise. This means we have information on housing, household furniture and bedding, kitchen utensils, farmers' clothing, farm equipment, shotguns, gramophones and sewing machines, but not of women's and children's clothing and ornaments. An estimate was made of the present value of cocoa farms on the basis of £50 per acre for a farm that is reaching maturity. Farms which have passed the period of maturity are estimated to have a value of £25 per acre. In addition, one must allow for food farms. This means trying to find the capital value of a food farm which has been cleared and planted in the first year and which will give the full return on this endeavour for very little extra expenditure of effort in the last two years of the rotation. There will be a difference here between Otumi and Subi for the greater expenditure of effort in the **first year of an Otumi rotation represents an investment in** the interests of a better return during the last two years, as well as an investment in the future long term productive capacity of the forest itself. The calculation here will be somewhat arbitrary and it seems best to take the numbers of days spent per acre on the first year's operations as the basis of approach to the problem. Thus in Otumi the farmer spends 36 man-days per acre. This means an expense of £9 per acre. It can be assumed that a farmer wishes to obtain £18 per acre from an expenditure of £9 on labour in order to cover his management reward. In fact, he gets in the first year only £6 or £7 from maize. The remaining £12 are invested to obtain the necessary return in the following years. At 25% interest, the farmer must obtain a return of £15 in the second year. This sum is covered by the returns of the second year and what is obtained from the farm in the third year can be taken as covering the expenses of management, harvesting and weeding in the second and third years. We may assume that the capital value of a first year farm is £12. Similar calculations are not really possible in the case of Subi for the reason that there is no real investment of labour in the interests of a longer term rotation. Rather the labour requirements of the maize type of farming at Subi are less than the labour requirements **for farming in the** savanna areas of the north. This is the measure of the disequilibrium in systems of farming. For it is certain that with persistence in felling of the forest for maize cropping, the time required to obtain a crop will increase as forest reserves of fertility are used up and as weeds therefore encroach, and the yields will fall. This system of farming does not call for investment in a crop sequence from one clearing, but rather involves a running down of assets in the interests of present gains. Yet in the meantime the Subi farm has an earning capacity due to the fertility reserves that have not yet been exhausted. This value is already less than that in Otumi and may be put for purposes of comparison at £9 per acre.

These calculations having been made and the value of other possessions added (see Table p. 21), one arrives at an average for the two villages of £545. The composition of these possessions as between the two villages is interesting. In Otumi, the main value resides in farm property which bears a ratio of 5:3 to non-farm property. In Subi, the relation is reversed and the value of non-farm property mainly in housing is more than twice that of farming property. The explanation is of course found in the abandonment of cocoa farming. Subi farmers have shifted their investment to house property. The substantial factors in the cost of housing are corrugated iron roofs and cement floors. Walls are mostly swish but houses have wooden doors and windows. For the two villages as a whole, non-farm and farm property both average £250 to £300.

INCOME AND POSSESSIONS

	Average Cash Income	Family Composition		Income in Kind (estimated)	Total Income		Possessions		
		Adults	Children		Per Head	Total	Non-Farm	Farm	Total
1.	69	4	3	96	24	165	447	157	604
2.	70	3	6	105	20	175	39	91	130+
3.	21	3	2	70	18	91	107	166	267
4.	79	2	3	61	28	140	221	124	345
5.	115	5	9	166	13	181	500	482	982
6.	77	2	2	52	30	129	79	644	723+
7.	62	3	2	70	26	132	NA	44	NA
8.	15	3	2	70	17	85	117	226	343
9.	52	1	-	17	69	69	54	438	492++
10.	67	3	4	87	22	154	63	37	100
11.	51	1	-	17	68	68	76	659	735
12.	187	1	1	26	106	213	477	1019	1496
13.	151	5	2	99	36	250	301	118	419
14.	334	2	7	91	37	425	1200	809	2009
15.	411	4	5	107+	57	517	120	43	163+
16.	132	4	5	107	27	239	72	234	306+
17.	160	5	4	105	30	265	1010	33	1043
18.	113	5	5	114	23	227	500	88	588
19.	135	2	6	82	27	217	369	434	803
20.	157	4	4	99	32	256	449	59	508
21.	76	6	3	114	21	190	98	94	192
22.	129	9	3	173	25	302	281	49	330
23.	50	2	4	66	19	116	NA	22	NA

Average income for both villages: ₦200

Average possessions for both villages: ₦545

+ These farmers have no home of their own, but live with relatives, rent free.

Farmers 1 - 12 Otuni

Farmers 12 - 23 Subi

The break down of non-farm property other than housing gives for the two villages together ₦25 for furniture and bedding, ₦37 for clothes, approximately ₦8 each for kitchen utensils and farm equipment and ₦7 for other possessions. Furniture comprises a bed (sometimes with an iron frame costing up to ₦10 or ₦15), 5 to 6 pillows, 3 to 4 blankets and armchairs, 2 to 3 wooden chairs, 1 to 2 tables, mattresses and lanter . 2 bedspreads, half a dozen kitchen stools and a wooden box for valuables. Farmers have 6 to 8 cloths; 2 to 3 shorts and sandals and the same number of shirts, shorts and sandals for farm work. Kitchen utensils include barrels for holding drinking water, 2 to 3 buckets, half a dozen to one dozen pots of different sizes and material (tin, aluminium, enamel and earthenware), half a dozen enamel plates and dishes, 2 to 3 glasses or other drinking vessels, pestles and mortars and trays which are used for displaying goods for sale, and 1 to two ladles. It is interesting to compare these possessions with those for the northern farmer in the Frafra survey, where the total per farmer including housing is ₦150. The two striking differences are those for housing and for farm improvements made necessary by a forest system of farming. Farm improvements at ₦265 greatly exceed the ₦30 invested in livestock farming in the north. The main difference in village property lies in the form of dwelling. In the forest village, the alternative to an iron roof is one of thatch, which increases the risks of fire when houses are close together. The larger rooms in a compound house require a bed rather than a raised earth platform for sleeping and they are a suitable place in which to gather and entertain visitors, whereas the round house is too cramped for these purposes, so that visitors are received under a tree outside the compound. Thus, the value of furnishings is greater in the forest. The demand for cloth levels off, as in the north, at six to eight pieces for a male. The price is however greater and this rather than anything else means that the value of cloth in the present survey is twice that for the northern survey. The value of containers, on the other hand, is fractionally smaller. This again is due to the exigencies of a different environment. In the north, the farming season is followed by a long dry period and farmers are much preoccupied with problems of storage. Similarly, the desire for the bicycle in the north is due to the scattered nature of the compounds. Consumption patterns are formed by the economic and social structure of a region. In several respects, the fundamental importance of neglected factors is brought out by the investigation of the capital assets and possessions of farmers. In this case, the importance for the creation of capital of a system of forest farming is made abundantly clear. So also is the element of thrift since higher immediate incomes are not necessarily associated with property creation. For the formation of possessions, there is every interest in lengthening the period of rotation and increasing the investment of labour in the unexhausted improvements of the land. In this way, an independent peasantry emerges.

Annual cash expenditure on farm and non-farm possessions in Otumi is in the vicinity of ₦28, which equals also 28% of the total expenditure. In Subi, the amount spent is ₦38, which represents 25% of the total expenditure. In this case, there can be no allowance made for farm expenditure on food farm improvements, for reasons which have been made clear. There is one thing to be added in terms of comparison with other areas: it is necessary to allow for expenditure not merely in cash but in family labour on farm improvements both in cocoa and in food farming. This expenditure in cash or kind on productive assets amounts to ₦7.10/- on cocoa and ₦5 on food farms in Otumi and ₦3 on cocoa farms in Subi.

ANNUAL EXPENDITURE (Excluding Income in Kind)

(with allowance for food and cocoa farms)

Average of Two Years

	Otumi 1)	Subi 2)
Farm expenses, labour and materials (in cash)	₦ 20.10/-	₦ 28.-
Bought food (in Subi, meat and fish ₦31.10/-) . .	34.-	45.-

1) 12 farmers in 1959-60, 7 in 1960-61.

2) 11 farmers.

	Otumi	Subi
Beer, spirits, palm wine, tobacco	¢ 4.-	¢ 4.-
School, hospital expenses, drugs, funeral and marriage expenses, taxes, fines.	11.10/-	27.10/-
Lorry fares	3.10/-	6.10/-
Clothing.	5.-	15.-
Building materials and expenses	14.10/-	20.-
Light and fuel.	1.-	1.-
Sundry.	5.-	7.10/-
Cocoa farms capital %	7.10	3.-
Family labour on food farms	5.-	-
Total	¢ 99.-	¢154.10/-

What then is the main conclusion of the survey? It is the impression of a type of farming breaking down in face of an urban drift and a shift to crops requiring less labour, leaving however great burdens to be born by the women of the country. Ghana farming has developed on the basis of small scattered plots surrounded by forest. In the new areas, this pattern has disappeared with the increasing size of the annual clearing. In the past, the scattered plot preserved favourable growth conditions for plants and ensured rapid regeneration of the forest but, under present conditions, it has made the diffuse larger holdings very difficult to work, involving an average waste of time and effort amounting to one third of a day's work. It has isolated the farm from village amenities and has used up more quickly than would otherwise have been the case the forest reserves of the country. In older areas, the work of deterioration is performed by maize cultivation. But this type of farming is only profitable at present as long as an initial crop can be followed by plantain, cocoyam or cassava and continuous maize cultivation is inimical to plantain and cocoyam. When yields in the farm rotation will have dropped to one half, this type of farming will be unprofitable.

A programme for the future calls for control of land use in an area as a whole with provision for forest reserves and, within a man's holding, the proper layout of his plots of forest, tree crops, semi-annuals and annuals, with such a balance maintained between them that a permanent type of farming is assured. In forest food cropping, the problem is one of improving the yields or reducing the labour requirements of plantains and cocoyams, encouraging farmers to establish a pattern of farming which gives an appropriate importance to tree crops through price policy and research on methods of establishment. A programme of taxing tree crops, because they are for export and therefore easily taxable, in a way that destroys permanent assets in vegetation and soil fertility is folly.

In terms of field rotation and layout of the individual holding, one might draw inspiration from the paysannat encouraged by the Ineac in the Congo, though it would be necessary to adopt a more flexible policy in the organisation, disposition and size of each holding. In field layout on a farmer's plot or plots (consolidated if possible), there might be alternate bands or areas of forest, oil palm, rubber, cocoa, plantains, cocoyams and so on with shade and cover crops used to give protection to crops and soil and reduce competition of weeds. Research into the appropriate size and layout of fields and into methods that involve the minimum disturbance to climax vegetation and soil should receive the highest priority. Extension work should then be undertaken in relation to existing farm units and adapted to the various conditions found thereon. It will then come down to earth and be forced to consider the farm as it is. This also implies that cocoa should be treated as a part of farm agronomy which has as a major constituent the growing of food crops. In terms of cocoa, the problem will be to preserve those areas of first class cocoa around Anyinam, Kononge, Wiawso, Teppa, Odoben, the Mampong scarp, Sewi Wiawso and the beautiful cocoa behind Bibiani; and then extend on the basis of these nuclei.

It is sometimes thought that there is very little that can be done about land planning. This is untrue. Reservations should protect necessary forest and watersheds. New and profitable crops, such as groundnuts in the north or tobacco at Kjura (crops which teach some of the lessons of intensive farming) may be introduced. There is much that can be done by the provision of roads or the decision not to build them; for roading will determine the speed at which new land is opened up and it is therefore crucial in determining the pattern of land settlement. Enormous harm has been already done by the network of widely scattered roads which timber companies have flung over the western parts of Ghana so that vast areas are felled simultaneously so that felled forest or young cocoa characterizes a whole area. There is no stability about such farming and few older farms form a nucleus of permanent vegetation. Gradual clearing in an area should not create such grave problems. There is need for a revised price policy, and there is education and extension work. It must be the standard pattern of extension to observe and comment on changes in activities on farms. Agricultural officers should not be so tied up with their stations and the trials they are conducting on them that they are unaware of profound changes taking place in farm management in their areas. The biggest experiments are those which farmers carry out and the results are sometimes more quickly observable than they are on an agricultural station, as in the present decline in the vitality of cocoa trees. Moreover, many of the procedures recommended by stations may be impossible or uneconomic from the farmers' point of view and only an intimate knowledge of required rates of return and availability of labour can keep an agricultural officer informed and realistic in his approach to farming problems. It should be standard practice that an agricultural officer on tour should keep notes on farming conditions in the area through which he passes and standards should be elaborated concerning tree and crop condition so that the reporting is as free as possible from personal elements of judgment and conveys a correct impression to a reader. Cocoa should for example be judged on canopy, depth of leaf colour and size, vigour of growth, robustness of trunk and conformation, and freedom weeds as well as on crop yield. Indeed, the one should balance the other. It should also be customary for the most senior officers, even directors, to tour the country periodically to obtain an impression of year to year or season to season trends in production and farming conditions. This is particularly true in a country which does not have adequate statistics of land area and yields according to each region. On this basis, valid advice may be given to farmers who will be quick to realise when that advice conforms to the conditions that they themselves have to face.

The change will not be rapid nor easy. Above all, it will take time to learn not to seek quick results in research work and to form a philosophy of farming which warns against unbalanced ugly farms and forest destruction. It takes time to be able to sort out significant areas which need special watching in order to appreciate trends; and it takes time to be able to determine trends from one year to another. Yet this knowledge is indispensable in assessing the success or failure of actual patterns of farming. It is therefore indispensable in assessing the desirability of new methods and the rate of fundamental development or decline in farming and production for the future.

Next, there should be no fear in facing reality. It is the desire for prestige which encourages a people and officials of government to be unwilling to accept or to report failures that may be occurring anywhere in the economy. Once this attitude is at all general, the junior officers who come most into contact with the farming community will be fearful of reporting and farmers fearful of admitting adverse tendencies. To remedy this situation, what is needed above all is a philosophy of farming. One or two very simple precepts should form the basis for this philosophy. One of them is that results are unlikely to be achieved or, if achieved, to be permanent, without involving greater work, interest and planning. Improvements in farming which are of enduring importance relate to capital structure. Short term gains can mean long term losses, as when a cocoa tree in poor condition yields heavily, and exaggerates the strain already imposed on the tree to make it yield in this fashion. Any short term attempt to increase farm yields in the absence of permanent improvements that create more favourable growing and development conditions, will increase the risks of farming. This is certainly true of other countries and there is no reason to suppose that Ghana will provide a unique exception. For example, it may be that fairly heavy concentration of shade and shelter on a farm

will provide conditions in which cocoa yields less heavily than if shade is reduced; but the shade will protect the cocoa in a dry year and prevent the encroachment of grassy weeds. Improved varieties, spraying and increase in yields unaccompanied by more attention to establishment, more supervision and greater efforts to keep the farm clean mean an increase in risks. Thus improved yields mean greater permanent investment in land improvements, earlier replacement of declining trees, a higher capital value of the farm and a higher level of observant management which produces and maintains a robust plant community. Those who claim spectacular results without greater effort and attention and a "longer" economic structure are doing a disservice to the country.

Retrospect

In retrospect, I do not think that anything need be added or taken away from what has been written in this report so far as fundamental propositions are concerned. For the time, at any rate, production in the area of recent new expansion in the north west and in the west of the forest is declining from its peak of 1960-61. On the other hand, it is still in a phase of growth in those areas where generous replanting grants were given several years ago so that it paid a farmer to have his cocoa cut out for replanting rather than to have it producing; and also in those other areas such as Otumi where farmers have redeemed cocoa planted a good many years ago. This means that present levels of output are not due to genuine increases in new planting. They are rather due to past replanting or redemption in older areas and to a shift from maintenance and extension to the immediate operation of harvesting. They are certainly not attributable to any overall increase in all areas consequent upon the introduction of spraying. It remains only to ascertain the permanence of the improvement in those areas where production has expanded due to the preceding operation of classical economic forces, profitable prices and subsidies. The profitable prices and subsidies no longer operate, since wages and living costs have risen substantially. In fact, the work of this and the West Ashanti survey do not give grounds for confidence in the future.

Geneva, January 1963.

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Part II.

K A D E S U R V E Y

by

M. Quao

INTRODUCTION

Kade lies 70 miles north-west of Accra to which there is a first class road connection. A rail service runs from Kade to Huni Valley with connections to the ports at Tema and Takoradi. The land lies deep in the Birim valley with a chain of mountains rising to 2000 ft above sea level, lying about 20 miles east of Kade. Other 600 ft hills lie on the north west. The land undulates slightly within these hills. Rainfall is in the vicinity of 60 inches per annum. The vegetation is purely "broken high forest", the result of cocoa and food farming over the last four decades or so. The rate and extent of deforestation is influenced by the pattern of farming. For instance, at Subi, most area have been clean felled of trees, leaving vast patches devoid of high forest. Thi is the result of maize and rice cultivation. Large areas are put under these cro yearly and, with the system of shifting cultivation still in practice, felling of large trees is expected to continue. At Otumi, the rate of felling is moderate because maize cultivation is not done on any large scale. Where felling has been done, plantains and cocoyams are planted to provide shade over cocoa seedlings, thus preventing soils from being exposed.

History and Village Organisation

The Akim Abuakwa tribe as a result of intertribal wars and the desire for land moved in groups from Adansi and other areas of Ashanti in about the mid of the 17th century. They made a number of settlements on the way south before finally settling in different parts of the Birim valley. Among the groups on the southern limit was Subi (one of the villages studied) and its related villages of Pramkese, Otwereso, Osenasi, Chia, Adubiase and Buadua. This village settlement could be dated about the end of the 18th century.

Otumi, the second village some ten miles further north was established on its present site about the same time that new settlements were made by the Abuakwas in the same area. However, Otumfuo Abrokwa, the founder of Otumi, did not originally belong to the Abuakwa branch of the Akims. He was the Adontenhene or chief of the advance army of the Akim Kotokus and he deserted his tribe after a series of tribal wars in which he lost many of his subjects; he then founded Otumi. In the re-organisation of the tribe that followed later, Otumi was included in the Abuakwa tribe.

To understand the position of Otumi and Subi in the general structure o Akim Abuakwa, it might be good to look briefly into the organisation of the tribe At its head is the Okyenhene (paramount chief of Akyem) assisted in his administration by the three councils: Kibi council, Okyeman council (state council) and the Amantoo Mmiensa councils. In addition, there are also the divisions organised on military lines; they are: Adonten (advance guard); Benkum (left wing); Nifa (right wing); Jase (rear wing) and finally the Oseawuo division. Otumi belongs to the Oseawuo division and serves under the Oseawuohene in times of crisi Subi on the other hand serves under the Odauhene of Otwereso who in turn pays his allegiance through the Benkumhene to the paramount chief. In this form of organisation, each village was brought under a wing chief and is ready to fight in times of war.

The day to day administration of each village was left entirely in the hands of the sub- or local chiefs who were assisted by their counsellors. At Otumi, the counsellors numbered 12, including a queen mother. The counsellors comprised the chief's close relatives, heads of the various "Abusua" or clans, and a few selected elders for their wisdom. A spokesman for the youth was invited to attend council meetings when his presence was found necessary. Lately, a committee of "commoners" has been selected by the chief and his elders to supervise community development works through communal labour, and also to supervise the allocation of land for building purposes.

Each Odikro is in effect the head of his village but pays his allegiance through the head of his division to the paramount chief. During the Odwira festival when the paramount chief purifies his stools and feeds the dead ancestors "nananom asamanfo", each Odikro pays homage through the head of his division to help the paramount chief in this task. Something is given by each chief. According to the Odikro of Otumi, he pays 28/-. As sub-chiefs pay homage with rum, so also do subjects of each chief pay what might be described as courtesy drink to the sub-chief when he also purifies and feeds his stools on the festive days. In fact, there is no compulsion in the payment of "courtesy drink"; all that is required is the sending of gifts to the chief to help in the task.

The stool, a symbol of the chief's authority, owns every portion of land and all the wild game on it. By tradition, it is entitled to the hind thigh of every large animal killed in the area. The hunter for his trouble takes the rest of the carcass. In return for the "thigh" given to him, he offers a service to his subjects and he orders search parties to be organised whenever anyone (hunter or farmer alike) gets lost in the forest. The animal population is fast decreasing and this custom is bound to die a natural death.

In the administration of justice, the Odikro's court is the lowest. From here, cases could go to the divisional chiefs' court and then to the paramount chiefs' court but, with the introduction of the local council systems, much - if not all - power has been taken away from the chiefs. However they still settle land disputes and trivial cases among their subjects. Serious cases go to the government courts.

In the 1920's the late Nana Ofori Atta, then paramount chief of Abuakwa, imposed a special tax on the Juabens who had settled in large numbers in Abuakwa. These Juabens were, before the imposition of the tax, treated as natives and granted free farming rights in all Abuakwa villages. The tax was assessed at 10/- on the farms each man held on separate farm tracks. For instance if a farmer had three farms on three different paths, he paid 30/- in all, a year. This form of taxation resulted in many Juabengs deserting their lands. The "Ahotow" or stranger tax as it was then known has been discontinued. The only tax paid now is that to the local council. It amounts to ₵1 per man and 10/- per woman payable to the West Abuakwa Local council. Palm wine tappers and all sellers on markets also pay taxes. Other local taxes may be imposed to help defray costs involved in settling village boundary disputes.

Land Tenure.

The Akans of whom Abuakwa is a part believe in ancestral worship. The land, regarded as a most valued material possession, was acquired through the blood of the dead ancestors. They, the dead, are therefore said to own the land.

The sacred stool is believed to contain the soul of the people and is also the visual link between the living and the dead. With the occupant of the stool is placed the guardianship of all stool land. This means that he holds all the land in trust for the 'Asamanfo' (dead ancestors) and for the benefit of the living subjects of the stool. In another sense, the chief's claim to ownership means that land is held in common by the people with himself as the trustee. This places the chief in a unique position in his community.

The paramount chief is the overall owner of all lands in Abuakwa, but each subchief had a part to play in the struggle preceding settlement of the tribe in the area. For this reason, subchiefs also hold land in trust for the paramount stool, the recognized overlord, and, to avoid disputes among the subchiefs, it has been necessary to define the boundary of the land they hold. The land was to be used for any type of farming by the chief and his subjects but was not, in general, to be sold to strangers outside the group. However, there are certain conditions under which land was permitted to be sold, to meet what people might like to call crushing debts of the village. If any such sale was contemplated, the paramount chief had to be informed for, without his approval, the sale would be null and void. Fortunately, no such sale is known in the two villages studied.

The subjects of the stool are allowed to use land freely for all farming and building operations. Even today, natives are free to acquire farming rights permanently by simply clearing virgin lands within their village areas.

According to the chief of Otumi, natives were in the past required to inform the chief of the village if new forest sites were prospected for farming. This was done in order to make sure that the plots in question fell within the village area. 'Rum was sent to the chief for libation after the area had been inspected; cultivation was then started. Elaborating on this statement, some natives pointed out that the provision of rum before farming on any virgin land was said to apply to Abuakwas from one village seeking farming rights in another.

Presently, new and unoccupied areas are not common. At Subi, for instance, free patches of virgin land are found adjoining peoples' farms. By custom; only farmers who own farms adjoining such areas have the right of cultivation. In clearing a new site, a farmer clears in one direction only. If he happens to be the only farmer on the site, he is able to extend his base line. By clearing a virgin land, a native lays permanent claim to that area and the virgin land adjoining it. He can bequeath such an area to a relative, mortgage it or give it as a gift to another (though not presumably to a stranger without the chief's consent FRB). Strictly speaking, however, the right to sell land is vested in the chief only. However, natives may sell their developed farms upon the consent of the chief who, in Otumi at least, claimed a third of the value of the sale. (Mr. Quao reports that some farmers contested this and stated that the chief was only entitled to "rum" from the two parties - both native or native and stranger - to the transaction, in order to register the change in title. Farmers also claimed that they can avoid this payment by the convention of representing the sale as a mortgage. Natives are forbidden to sell virgin land FRB).

Boundaries have often been the cause of many disputes between villages and even among natives in any village area. Normally, the meeting points of farmers cultivating either in the opposite direction or side by side is redognised as their boundary. At such meeting points, the most common practice is to plant "Ntomme" trees. Permanent features such as streams, valleys and roads, large forest trees and footpaths are also used as boundaries.

Timber, virgin lands and minerals in the earth are the property of the stool, but farmers are paid one third of the value of all timber felled in their lands as compensation for any possible damage done to crops. Crops damaged in the course of prospecting for minerals are also paid for by the company who owns the concession. Apart from these checks, no restriction is put in the way of farmers so long as they respect the rights of others in their farming operations.

Non-natives who desire to make permanent residence are introduced to the chief by a native. The stranger, when assured of a place to farm, is asked to pay rum and is then admitted into the community. He becomes a citizen and shares all responsibilities of the village equally with the natives. A stranger who does not intend to make permanent residence is asked to pay a lump sum of money to the chief and showed a place to farm. At the end of the period of his stay, all his farms become the property of the chief. The right to accept or refuse any stranger as far as land questions are concerned rests with the chief.

In the past, when land was far in excess of what villagers required for their own needs, it was possible for chiefs to grant land to abusa workers. Only strangers worked under this system which meant dividing the proceeds into three parts. A lump sum of money was demanded by the chief from the stranger and he was then left to develop the land into a farm. Where a tenant planted a permanent crop, all sales of food crops were given to him to help defray the cost of establishing the farm. When the permanent crop started to fruit, the chief sent in and collected a third share of all sales. Where the tenant planted food crops only, the chief took his one third share in food or cash. A tenant was permitted to transfer his tenancy to a third person upon informing the chief.

Lands granted under the abusa system provided the chiefs with a good source of income but, at the moment, all lands granted in the past under this system are administered by the stool land revenue collector who collects and pays into the stool land treasury all cash due to the chiefs. This however

does not debar natives from giving their secondary bush areas to abusa tenants as elsewhere in Ghana.

Where a farmer allows his secondary bush area to be developed on abusa terms, one finds it difficult not to assume that such an area (the tenant's part) has been exchanged permanently for the labour and capital of the tenant. It often happens that the developed cocoa farm is divided into three parts; the landowner takes his one third share and manages it as a separate holding while the tenant manages his two third share separately. Cocoa is a permanent crop and its life span is over an indefinite period. If a landlord agrees to the sharing of the plot, then it means the conditions of the abusa contract have been satisfied; the tenant is free to manage his farm in his own way except that he has no right to sell. The length of time a tenant must "own" his portion of the farm is not stated and so he keeps it as long as there are cocoa trees on the farm. This means the tenant keeps his portion indefinitely and only a law court can decide the interpretation of "as long as there are cocoa trees on the farm."

Inheritance

If a native uses his own labour and capital in acquiring farming areas, such areas are his private property as long as he lives. In his lifetime, all areas acquired by him could be put to any farming use or given away in the fashion allowed by custom. But as soon as he dies, inheritance will be decided by his family which in this case is traced from the mother.

If is often said that in Abuakwa nephews (sons of one's sisters) inherit uncles, but this is not true in its entirety. According to J;B. Danquah, on the death of a male member of a family, who shall inherit is decided by the mother's family, but where there is controversy over the choice, the mother of the deceased may inherit her son. Other members of the family also have right to inherit the deceased. There are cousins of the deceased (i.e. eldest aunts' son), brothers of the deceased, nephews and sisters. Christianity has also had its influence on the system of inheritance. Among members of the presbyterian church in the area, on the death of a member, one third of all his farms and farming areas go to his relatives (family) and 2/3 to his wife and children. A wife's own farming area belongs to her family on her death. The eldest daughter normally inherits her properties for the benefit of all brothers and sisters, but where there are no daughters, sons may inherit their mothers.

Land acquired by a total stranger becomes the property of the chief if the stranger does not name his successor, who must at least be known in the village. If the stranger has children in the village, they inherit their father.

Economic History of the Area

Most of the villages in the area including the two studied (Otumi and Subi) were established in the late XVIIIth to the early XIXth century. The problem inherent on new settlements of those days was the struggle for existence. Food farming and hunting were the basic needs then. But that was not all, for trade with the coast was a source of trouble between the coast and tribes in the interior, notably the Ashantis and the Akims. The settlement of the Abuakwas near the coast led them into developing footpaths to the coast to help promote trade; hence the inter-village foot paths. Soon, footpaths were leading to Accra, Winneba, Saltpond and Cape Coast. The "highways" from the survey area passed through Otumi and Subi. Other paths led to Akuse, then a commercial town, and to the interior, notably Kumasi. Before 1870, these paths were full of caravans moving to and from the coast.

A journey from Otumi to Accra took six days and nights were passed at Kade, Osenasi, Asuokaw, Nsakyeso, Akwasiman and Accra on the sixth day. A similar journey to Winneba took six days and the route was through Kade, Kusi, Omanso, Mpankyereni, Akroso, Nsaba, Agona Swedru, Onyinaakuase and Winneba. All villages on the route served as catering houses for travellers. They bought food in the villages, were given bush meat for the meal and places to sleep for as little as 3d or 6d for a group. In this way, the villagers found a way of selling their excess produce. Markets in the sense of an open space where buyers and sellers met to exchange goods were unknown.

Apart from the satisfaction of the farmers' own requirements of food, their other occupation which also served as a means of deriving incomes was the collection of wild rubber, kola nuts, and hunting. The women sold raffia fronds to carriers who used them either as walking sticks or for supporting their loads when resting. At Otumi, the most popular job was gold washing since the stream Asamosuwa, just 2½ miles from the village, was noted for its rich "finds".

During the latter part of the XIXth century, production of wild rubber and kola increased; it became necessary for most people to visit the coast. The caravans that left each village increased and visits to the coast had to be done by turns in order not to leave empty villages. On the return journey, farmers bought their requirements of salt, tobacco, gunpowder and clothing. This form of trading continued until the introduction of cocoa into the area in about 1896-190 It has been stated by an old man in Otumi that the first pods were introduced by the Basle missionaries about 1889. Each pod cost 2/6 then. Whatever the actual date of its introduction, a few cocoa farms were seen scattered over the area in 1900. The period 1900-1910 saw farmers seriously cultivating cocoa, but the rate of expansion was slow. No one could say with certainty when the first export of cocoa was made from the area but, considering the date when the pods were introduced to the time when farms were established as an economic venture, export was not likely until about 1915-18. Export of cocoa from areas to the south of Kade might be earlier. One cannot lose sight of the fact that extensive cocoa farming started to spread from th; Akuapim ridge and spread gradually into the interior of the forest. If one were told that exports were made at Asamankes before farmers at Kade started making cocoa farms, one was inclined to believe th because Asamankese is nearór Nsawam than Kade, and Kade than Otumi.

Cocoa cultivation gradually ousted kola from the limelight but cocoa cultivation had its problems. Before 1900, subsistence farming was the main practice. The only amount of labour required was the effort provided by the farmer and his household. Extensions to the old farms meant more labour but this was difficult to find. To overcome this problem, farmers had to resort to "communal clearing", where a group worked in turns in one another's farms. More wives meant assured and perhaps cheap labour. Further to this system of clearing, labourers of Moshie and Zambrama extraction became available in the later years of 1918-20 on a daily wage of 6d plus sufficient food to last each labourer another day or so.

Until the road from Accra reached Asamankese about 1924-25 and Asuam in 1926-27, the question of carrying forest produce to the coast was also a problem, but luckily these labourers were willing to do this task also. The seasonal movement of labour became influenced by the cocoa season. Since it was the habit in those days for the labourers to return home when the cocoa season ended, those who stayed behind were often derided with a song in Hausa which went thus: " Cocoa yakale Zambrama tefi gida" which means: "The cocoa season is over, so Zambrama go home !"

Cocoa brought more money to spend, for it had been possible for the first farmer at Kade to cement his room in 1916 and to use kerosine which was then thought to be a luxury in 1919. Cocoa cultivation gradually spread over the area of the survey and, by 1929-35, most people had cocoa farms of varying sizes. But it was not smooth sailing all through for; at the same period, traces of failure of trees had been detected in many places. This led to farms being left in the bush and in cases where damage was great, they were abandoned altogether. Land was not scarce and enthusiasm in the industry was great. Most farmers established farms in different areas of the same village, just in case one area might prove suitable. Whilst farmers were struggling to maintain their farms, another drawbac occurred in the fall of the cocoa price in the nineteen thirties, resulting in the cocoa hold up of those years and the setting up of the Nowell commission. These two factors and the small wartime outlets for cocoa had their influence on cultivation in the area. Farmers who had invested large sums of money into cocoa cultivation and whose farms were badly affected by what was later known as capsid took to food farming. One such village was Subi. The population in the area was increasing gradually as the result of the establishment of many industries. Food farming became a lucrative business. Farmers at Subi and other places took to planting th traditional crops of plantain, cocoyam and yam on a large scale to make good the loss of income from cocoa. Large scale maize and rice farms, by local standards,

began in the early forties. This development was aided by the road and rail connections with the coast.

Economic development had also been stimulated when diamonds were discovered in the Birim valley in 1919; further to this was the rich timber in the area waiting to be exploited. The mining companies of C.A.S.T. at Akwatia, Holland Syndicate at Takorasi and C.A.Y.C.O. at Boadua started their mining operations in the late twenties. Extension in their work meant the employment of more hands and the creating of markets for farm produce. By 1945, many aliens mainly Nigerians were rushing into the area as diamond winners. This tended to increase the non-farming population and the market for food crops. The first timber merchants to operate in the area before the second world war were R.T. Briscoe, Morkey and Aboagye following one after the other. Conditions for bringing logs to the roadside and then to Kade for railment were however difficult. Logs had to be pulled by manpower on sledges.

The period after the second world war has seen an increase in economic activity of the area. The river Birim was bridged and completed for traffic in 1956; the road from Nsawam to Kade has been widened and tarred for more and heavier traffic whilst others have also been constructed from Takorasi and Okumani to Kade. The latter, with its siding facilities for handling timber, has become the headquarters of the timber industry in the area. Here one finds a sawmill and the I.D.C. Match Company, employing a large number of workers. In the trading field, there are three expatriate firms dealing in all types of consumer goods but, in the field of produce buying, all five firms which were engaged on this have been forced to close down. Presently, only the Ghana Farmers Council buys cocoa.

In the agricultural field, except where rice and maize are grown, farm sizes have not increased to more than five acres at a single clearing. The size of cocoa farms established about a decade or so ago has remained almost the same. Of the 23 farmers studied, only two had well maintained cocoa farms nearing 20 acres. The size of food farms in which the traditional crops of plantain and cocoyam are grown is still under five acres at a single clearing. However, there is a tendency among some farmers to stop cultivating the traditional crops and to concentrate on maize and rice. In this case, the size of farms has been found to be ten to 15 acres and there are a few who are able to work farms of over twenty acres per season. The desire to clear large areas is understandable if the farmer must make allowance for the vagaries of weather and pests and yet expect a profit on his outlay. But there is also the danger of clearing larger areas than what a household is able to work with its resources.

During the survey, considerable interest was shown in recultivating abandoned cocoa. The reasons for this are not difficult to find. Cocoa in the past had a steady price and, though many young farms failed before any good harvesting could be done, farmers still struggled on, always hoping that a few bearing trees would be worth the trouble. Again, cocoa, when fully established, does not require the yearly heavy expense involved in clearing and felling as in new areas for new farms. One very important factor was the introduction of Gammalin 20 which has made it possible to control capsid bugs in cocoa farms.

Generally, the attitude to farming among the younger generation, however, is that of disinterestedness; among the older generation, it is an attitude of uncertainty. Some farmers are investing their money into other businesses such as shops and buildings. To make ends meet, some of these farmers take on jobs with the timber merchants in the bush while others take to palmwine tapping. To my mind, how much is derived from such jobs is not as important as what prompts farmers to take on such jobs. The answer to this is obvious. Industry is competing with agriculture for labour; yields and incomes are still low; prices of foodstuffs are uncertain while productive resources are scarce. Wages paid to farm labourers are irregular and unassured. At the time of writing, the rate was 4/- whereas in industry the daily wage was 6/6. There is no wonder if farm labourers leave for employment in industry. If our agriculture is to be saved, then a remedy for these problems must be found.

Village Amenities

Unlike Krobo and Frafra, farmers in the area studied live in collections of mud houses making up village communities and farm the lands around those villages. The selection of sites depends on many factors, including nearness to drinking water and roads. But where roads cannot be constructed to link up with main communications, a change of site is made to a suitable point near a road as in the case of Subi.

Subi and Otumi are served by a regular road transport system from Kade to Nkawkaw. This road is not tarred, but it is well maintained by the public construction department and is open throughout the year. Access to farms on the other hand is by farm tracks which, though not motorable, are occasionally used by timber trucks and tractors. The maintenance of all farm tracks is a collectiv responsibility of all farmers using the particular path. All that is required to keep them in good condition is weeding about once or twice a year. But where a farmer's own private path bifurcates from the main track, that portion is his own responsibility to maintain. It will be seen from this that headloading still forms an important part of the day to day activities of farmers. Nearness to the road apparently influences the type of crops selected by farmers for cultivation. For instance, areas away from the road will not be planted with cassava on any large scale because cassava is heavy and difficult to headload over long distance

Streams provide the main source of water supply. The supply is constan and presents no problems except under conditions of long drought where at times i becomes necessary to collect water from ponds left standing in the river beds. T department of rural water development has sunk two wells to ensure the supply of good drinking water throughout the year but unfortunately these are unpopular wit the villagers. Medical facilities are available at Akwatia, Takorasi and Kade. Speaking generally, the distance to the nearest hospital depends on how far a village is situated from any of these centres. Otumi and Subi are twelve and three miles away respectively from Kade. Sanitary services are provided by the West Akim Abuakwa local council, but communal labour also plays an important part in the provision of services generally. The main post office is sited at Kade from where telephone facilities have been extended to Otumi and other large villages. Subi has no post office of its own. As far as entertainment is concerned, Subi and Otumi were found to be dull. Soccer was the most popular game among the young men. For the older men and women, no form of organized entertainment was observed, at least throughout the period the survey lasted. After a hard day's work, palmwine served as a soothing drink and the rush for it quickly confirms it importance. At Kade, on the other hand, cinema shows, concerts and dances are not uncommon. There are also the beer halls where people could go and listen to music played on radiograms.

The presbyterian church was established at Otumi in about 1889 and it is said to be one of the oldest stations in the country. It has contributed much towards the development of education in the area. Proof of this is the number of old people who are able to read and write Twi in the area. The first school was established at Otumi in about 1891 and the first resident minister was appointed in about 1906. Otumi has both a primary and middle school with 177 boys and 114 girls on roll. The school is staffed by ten trained teachers. At Subi, there is only a primary school of 53 children manned by two untrained teachers. Pupils in the upper primary and middle schools attend classes at Kade, which is 3 miles away. The predominant Christian denomination in the whole area is the presbyterian churc but there are also the catholics, methodists and apostolics who have a large following. Islam is popular among the non-Ghanaian African settlers.

Labour

From as far back as 1918 or earlier, labourers from the neighbouring French colonies have been known to travel south for farm jobs. The Moshies and the Zambrammas were the first tribes to arrive in the Kade area in about 1918. They were followed later by the Fulanis. The first Ghanaians from the north to seek jobs in Kade were the Dagartis, but they preferred to work not on the farms but rather on the construction of roads going on in the district in 1926. It is said that the Grumahs and the Frafras joined the group rather lately, about 1939.

As cocoa farming expanded in the district, the need for more workers at certain months of the year influenced the southward movement of labourers and, since cocoa farming has not been as successful as in other areas of the country, the services of these labourers have been diverted to food farming in the recent past. This has been so in areas where cocoa farming has failed - Subi for example. Hired labour is mainly employed to do the clearing of all farm areas. The terms under which such farm jobs are done vary; they are:

- the contract,
- Atabrako or "by day",
- annual,
- abusa, and
- "Nkotokuano" labour systems

1. The Contract.- Under this system, a clearly defined area of bush is bargained to be cleared or felled at a price agreed upon between both farmer and labourer. The completion of the work ends the contract; more work is done per man-day in order to hasten the operation. Usually, labourers working under this system work in groups of four or more. Food is provided in kind or cash by the farmer.

2. Atabrako or "by Day".- Under this term of contract, the labourer sells his labour in terms of hours. The working day is fixed at six hours, but labourers do not work for the full six hours on the farm; the actual number of hours worked may be estimated at 4½. To the labourer, the amount of work done is not as important as the time taken to do it. The rate of pay at the time of survey was 4/- plus a midday meal valued at about 9d. As the result of the recent wage increases, these labourers are demanding two meals a day before working from 9 a.m. to 2 p.m.

. Annual Labourers.- These are uncommon but at Subi in 1960, two teenage Grumah boys were employed under this contract. The conditions were:

a) the contract was to last 12 months;

b) at the expiration of the 12 months, the farmer had to pay each man ₵18 in cash;

c) during the period covered by the contract, the farmer was to provide at least two meals each day, provide the labourers with farm implements, provide lodgings, soap, pomade, farm clothing and one cover cloth;

d) the farmer was to bear the cost of treatment in any one week of illness but, if the sickness should continue, the labourer was to bear the expense in treatment;

e) a six day week was stated to be the normal working week, but the farmer was allowed to decide what type of work was to be done in the "eight" hour day.

The labourers lived in the same compound as the farmer and took part in some of the domestic work. The number of hours spent on the farms was reduced to four to five hours to enable them to spend some time on their domestic jobs.

4. Abusa Labourers.- By this system is meant the contract under which a developed or semi-developed cocoa farm is given to a second person to maintain for a share of one third of the proceeds from the farm. Strangers are known to be better abusa labourers, but Akims have also taken on such jobs. Conditions of the contract vary from farmer to farmer, but the main ones are:

a) the payment of a lump sum of money to the farmer as drink. How much is paid depends on the size and condition of the farm. A farmer may demand about ₵20 for a good 20 acre farm;

b) the labourer, on payment of the amount, becomes responsible for all maintenance operations: weeding, gapping, harvesting and drying. He may employ people to do all these operations for him;

c) he is free to work for other people if he finds his income from the farm insufficient. He therefore plans his own working hours to suit each farmer;

d) he provides his own tools;

e) the contract can be terminated by either side when dissatisfied, but any cash difference is settled first.

This is not part of the contract, but a farmer may permit his abusa labourer to work a separate farm on the landlord's own farming area. Since the abusa labourer works for other people, the farmer feels he is not to be responsible for the labourer's upkeep.

5. "Nkotokuano" Labourer.- Under this contract, a labourer is paid a fixed amount based on the number of bags of cocoa harvested. Only one such labourer was employed (for a short period) during the period of the survey. The wage was fixed at 6/- on every load of cocoa. Under this heading comes another type of labourer employed to harvest rice. Payment is made in rice harvested to the labourer at the ratio of 4:1, 3:1, or 2:1. The harder such a labourer worked, the more he earned.

Subi farmers cleared larger areas during the survey and therefore found the "contract term" cheaper. Farm sizes at Otumi were found to be smaller; farmers employed both contract and "by day" labourers.

Though hired labour plays an important part in farming operations, it must not be assumed that farm families are idle. Clearing and part of the felling operation are done with hired labour, but the remaining operations of felling, chopping, stumping, burning and the gathering of forest debris are done with family or household labour. When household labour is unable to provide the amount of labour required for any of the above operations, then it becomes necessary to employ hired labour.

While male members are engaged in felling and stumping operations, the women lift cocoyam corms and plantain suckers. Where maize and rice are cultivated, both men and women take part in the operation; but the planting of cocoyam, yam and plantain is done by the women and children. The men are responsible for the staking of yams, setting traps and fencing farms. Weeding, harvesting and headloading is a household affair, but hired labour may be employed.

Household labour provides the cheapest form of farm labour, for no payment is made for any work done on the farm apart from the food enjoyed by all, though gifts are offered to adult sons and nephews who help in farm operations. During the survey, one farmer gave his nephew a gift of over ₵15 to enable his nephew's son to marry. Apart from the yearly presents of cloth which a man makes to his wife, she is allowed a share of half the sales of plantain and cocoyam she makes from the farms. She is allowed to cultivate a small farm of her own on which the man helps occasionally. A farm family normally consists of the man, one or two wives and about three children who spend the greater part of the year at school. A farmer may have adult sons and daughters but, as soon as they get married, they begin to work on their own. This does not however rule out occasional visits to one's father's farms to work.

Markets.

There are in the area studied five markets in a radius of about 20 miles. They are situated at Akwatia, Boadua, Asuom, Kwae and Kade, but only Kwae and Asuom markets are what might be termed food exporting markets. The remaining three might be described as consuming markets, that is markets where produce reaches the final consumer. This is due to the influx of people seeking jobs in the timber and diamond industries, making it necessary to import food into these centres to supplement their own production. In addition, there are open spaces in smaller villages where purchases and sales are made and, at the peak of the plantain season, it is not unusual to see plantains and other crops displayed outside compounds awaiting buyers.

Bringing foodstuffs from the holding to the village is done by head-loading, but trucks are always available for transporting them to the markets. It might be of interest to state that within the 20 miles radius, no village is more than 6 miles by road from the nearest market. Otumi is about 6 miles from Kwae and Subi three from Kade. The movement of food is not confined to production from the area for foodstuffs, notably yams, have been recorded as coming from Kumasi while oranges, pears, palm and kernel oil have been known to have come from Asamankese.

In the sale of farm produce, every household is responsible for the disposal of its own crops. It is said that selling farm produce is a woman's job, but I think frequent visits to markets by women to shop enables them to know market conditions and to be able to bargain wisely. Business on the market is transacted through middlemen or directly with the consumer. Trade in maize is usually conducted through Zambrama and Ewe maize dealers on the markets. The dealers study supply and demand and decide on what to pay for a certain measure of maize on any market day. Farmers' wives must agree to the price, otherwise there is a hold up in proceedings. This may last a few minutes, but usually the dealers have the upper hand. The demand for maize is usually constant, but the supply changes more often; this results in prices being determined on market days only. The quantity of maize on the market at a particular time determines how much is to be paid for it.

At the harvesting season, most farmers do not store maize and those who do sell a good deal of the crop immediately. This results in flooding the market and prices fall rather low. Prices start rising again when the unstored maize has been sold out. Normally, prices are at their peak during the clearing of new areas for new farms. A few farmers are able to wait until this period when they get the best price for the season, but the longer the storage the greater the damage by weevil. In 1959, the price at harvesting time for a kerosine tinful of maize was 7/- but, by the following clearing season, it rose to 10/-. In 1960, the amount paid at harvesting time for the same measure was 7/- and by the 1961 clearing season, it rose to 20/- for the same measure (This was a year of shortage due to drought conditions FRB). The standard measure for maize on Kade market was the kerosine tin and prices for a bag of maize were quoted by reference to the number of kerosine tins of the crop that filled the bag (four in number FRB). The retail measure is a tin called Odonka. A kerosene tin full of maize weighs 56 lbs and an Odonka 8 lbs; eight measures of the Odonka fill one kerosene tin. (Some gain here for the trader.)

The middlemen buy at wholesale prices, store and sell at retail prices to consumers. They are also able to grant credit facilities to buyers of maize who purchase in large quantities. This creates some sort of friendship between the middlemen and the buyers. To ensure a constant supply, maize farmers are wooed into friendship by these same middlemen. Nothing prevents the farmer's wife from selling directly to consumers, but what is normally done is to sell to the middlemen. In the sale of rice, the rice-mill serves as the meeting place for farmers and retailers. Whether a sale is done with a retailer, middleman or consumer, bargaining is the most important element in trade.

No household at the time of the survey was able to produce enough plantain at a time to make a trip to a market necessary; if plantain was sent at all, it was sent along with other crops. But the amount of plantain in a village at any particular time might be considerable. The village middleman plays a very useful role here; he buys in small quantities until enough plantain is obtained to justify a trip by truck to the market. He may sell directly to the consumer on the market or to other middlemen. One other method of selling farm produce, mainly cassava, is to sell on the farm. Here, the area is measured in yards or "abasam" and bargained.

The Kade market place where the buying and selling of foodstuffs is done is a small area estimated at three acres. Markets are held there daily, but attendance is greater on Tuesdays and Fridays, market days. At the time of the study, there were 7 rows of open sheds and 30 single stalls scattered about the edges of the market. The chop bars characteristic of all commercial villages are also found. Trade is brisk in the mornings, when farmers' wives sell their crops but, in the afternoons, it is switched on to the selling and buying of imported goods (with the cash thus obtained FRB). The total attendance at the

peak hours of trade is estimated at 900 persons. In the villages, there were shopkeepers who sold tobacco, tinned fish and meat, sugar, milk and non poisono drugs. At Otumi, there are six shops better stocked than those at Subi; this i so because Subi is so near Kade that villagers could go to the town at any time of the day to shop.

PRICES PAID TO FARMERS IN 1960 AND 1961

(IN VILLAGES)

Month	Maize		Rice		Plantain			
	Kerosene tin 56 lbs		Kerosene tin 56 lbs		1960		1961	
	1960	1961	1960	1961	Fingers	Value	Fingers	Value
anuary	10/-	12/-	28/-	25/-	8 - 12	3d	10	3d
ebruary	10/-	12/-	28/-	27/-	8 - 12	3d	10	3d
arch	10/-	16/-	28/-	27/-	8 - 12	3d	10	3d
pril	11/-	16/-	28/-	27/-	8 - 12	3d	7	6d
ay	12/-	20/-	28/-	30/-	8 - 12	3d	7	6d
une	8/-	20/-	28/-	30/-	7 - 8	3d	6 - 4	6d
uly	8/-	15/-	28/-	30/-	6	3d	5	6d
ugust	9/-		28/-		6	3d		
eptember	9/-		28/-		6	3d		
ctober	10/-		28/-		6	3d		
ovember	10/-		28/-		6	3d		
ecember	10/-		25/-		6	3d		

In view of the importance of cocoa in the national economy, its marketing is organized on a national basis. In the past, both expatriate and local firms were licensed to buy cocoa on behalf of the Cocoa Marketing Board. They had branch offices at Kade, from where business in the district was organized. Large storage sheds were built from where cocoa was graded and sealed before being sent to the ports. There was competition among these firms and, to boost up purchases, they appointed commission agents in the villages to buy coco on their behalf. These commission agents had no sheds but stored cocoa in odd places such as living rooms. Such brokers did not buy large quantities of cocoa and often sent their stocks regularly to Kade to avoid congestion. However, whe sub-agents were appointed, storage sheds were rented in the villages; in all cas both brokers and sub-agents were given bags and cash advances for the purchase o cocoa. There were also the free lance brokers who were not attached to any part cular firm but accepted contracts from main agents for limited periods only.

The organisation of the cocoa market has now been changed and only the Ghana Farmers' Marketing Cooperatives have been licensed to buy cocoa. All shed owned by the former buying agents have been taken over by the new firm and servi of their former employees have also been secured. Kade still remains the centre from where business in the district pivots. One aspect of the new organization that all villages capable of producing 100 tons of cocoa form separate buying societies and, where production is under 100 tons, a number of villages are grouped together to form one society. Otumi and Subi are unable to produce 100 tons each and have therefore been advised to join the societies at Kwantanang an Kade respectively.

The produce inspection division of the Ministry of Agriculture provide the services needed to supervise the quality of cocoa purchased from the time a farmer sells his crop to the time it leaves the sheds at Kade for the ports.

This is ensured by grading and sealing all bags of cocoa before they leave the sheds. Weights and grades are checked at the ports.

Agricultural Practices

The rains determine the farming seasons, and there are two rainy seasons in each year. The major season rains start in about March and ends in June; there is a break in July-August followed by the minor season rains in September ending in November. Farm sites are therefore prepared in the drier months and planting of crops follows during the rains. The farming methods are simple and do not entail the use of farm machinery. The first operation is to clear the forest undergrowth, followed by the felling of some of the large forest trees on the site. This is done to break the canopy of shade. At Subi, most cleared sites are clean-felled to suit their type of farming. The next operation is to chop the vegetation debris into heaps, then allow a few days for these to dry up before setting them on fire. Clearing the unburnt debris from the site and reburning is a slow and hard job and is therefore spread over a number of months. This operation considered in its detail is unnecessary where maize and rice are cultivated. The final operation is the planting of the crop which, at its earliest, is started in late February and continues throughout the major season rains.

Maize and rice are usually planted early so that they may make the fullest use of the rains in March, April, May and June. The planting of cocoyam, plantain and cocoa is done in the middle of the rainy season - May. Rice is always grown as a mono-crop on a site, but all other crops are grown mainly in mixtures of two or more crops. Maize, however, at times stands as a mono-crop on farms. Where there is a crop mixture of more than two, the ratio for one is of course reduced to allow space for others (But at any stage of growth, however, only one crop dominates a farm FRB). Rice is broadcast over the site and planting is done later in the ungerminated patches. The first month or so after broadcasting is used in scaring away birds. This is stopped after the crop has germinated. Scaring starts again in July-August and continues until harvesting is completed in about late August or September. Only one crop of rice is harvested in a year. In crop mixtures, maize is first planted, followed by cocoyam and later plantain and cassava. The amount of yam grown is insignificant, but it usually precedes all crops on a farm site. Other crops grown are sugar cane, pineapple, banana, garden eggs and peppers.

The weeding of new farms starts in about April at the earliest and continues until the harvesting of maize in July-August. While weeding goes on, cocoa seedlings may be introduced. On the other hand, if a farm is under a crop mixture and weeding is delayed, both the harvesting of maize and the weeding are done at the same time. If maize planted as pure stand crop is not outgrown by weeds, no weeding is done before the crop is harvested.

Maize farms at Subi are usually about ten acres or more in size and therefore too large to be planted with cocoyams and plantain at one planting season. What is normally done is to plant a portion of such farms with these crops and leave the rest of the farm to go back to bush after the main harvest. If a farmer desires, he may cultivate the remaining portion in a subsequent season.

The rains often do not come on time, but a farmer may still want to plant his food crops and cocoa. What he does is to clear the forest site, plant his cocoyam, plantain and cocoa beans, wait until the middle of the rains and then fell the forest trees. With the rains and time, the vegetation debris decays, resulting in vigorous growth of the crops. This method is known in the locality as "Proka".

Following closely behind the major season is the minor season which starts in September and ends in December-January. Clearing of farm sites starts in the drier months of July-August, followed by planting in the first week or so of September, depending on the rains. Normally, farmers do not burn the vegetation on such farms. The reason for this is that in most cases no new areas are cleared; instead, sites planted to pure stand maize in the major season are weeded and made ready for another crop. A few farmers plant vegetables in the minor season. Large farms are not made because of the impending cocoa season. Attention is directed to

weeding of cocoa farms and improving the sanitation in them.

In the major food farming season, cocoa is planted among food crops. This raises the question of whether cocoa is the by-product of food farming. In my own opinion, as soon as a farmer plants cocoa in his new food farm, the ultimate aim is to establish a cocoa farm. Food crops, apart from providing temporary shade for cocoa, also save the farmer the trouble of having to develop a separate food farm thus economising his resources.

There is a good deal of carelessness in the detailed maintenance of farms. On the whole, weeding of matured cocoa is done only once in every year, but the extension of farms goes on yearly. This increases the overall amount of weeding required on all farms. When a farmer is unable to cope with this, he neglects some of the farms. In mature cocoa farms, no minor cocoa crop is harvested on any significant scale. Farmers therefore do not weed their farms in the first half of the year. The yearly main crop suffers. The weeding is done in August-September, just before the main crop season starts. This habit of neglecting farms that will not give immediate gain is also manifest in food farming. For instance, food farms from which harvesting has been going on for about 18 months are neglected as soon as new farms mature . In the establishmen of new cocoa farms, which normally contain foodstuffs - plantain, cocoyam - weeding is done twice in 18-24 months. This may be followed by another weeding operation in the third year and the area is then left to go back to bush. After the fifth year, the farm may be weeded and the spaces gapped with cocoa. Weedin is then done once a year.

One characteristic feature of the area is the extent of re-cultivating abandoned cocoa farms. What is being done in the "reclamation"work" is to start recultivation from a good looking patch of cocoa and extend (from this point) the area annually in any direction. The rate of re-cultivation is increasing, perhaps, because it requires less labour to work in such old areas than it does in new areas; not much new planting of cocoa is done. (The price-cost situation is unfavourable to fundamental long term expansion FRB.)

Before 1958, the widespread use of "Gammalin 20" was unknown; the good results achieved by the early users of the insecticide as control on the capsid bug helped to draw attention to the old and abandoned cocoa farms. At the momen all farms sprayed with the insecticide are reported doing well. In addition to the capsid bug, the most troublesome pests are rats and grass cutters who betwee them destroy anything from cocoa seedlings to pineapples. Mice and weevil are serious pests on stored maize, while birds do damage on rice farms. The only methods adopted to control these pests are by fencing farms, setting traps, setting fire under stored maize barns and by shouting away birds from rice farms A few farmers have started spraying maize in sheaf with "gammalin 20" before stacking it on barns. The result is said to be encouraging.

The selection of farm sites is limited by the area of land a farmer owns or is entitled to; the dominant factor is the age of the vegetation. The longer an area is left to regenerate, the better it is for farming; but the selection of crops to grow depends on soils. Boggy soils in virgin lands are used for all types of crops but in secondary bush areas such lands are put to rice and maize. Clay loam and sandy loam are said to be ideal for all crops.

Crop rotation is not definite and therefore difficult to state briefly. It follows roughly this pattern: plantain, cocoyam, yam, maize and vegetables are first grown in any new forest farm. By the end of the second year, all crops are harvested except plantain. Cocoa may be introduced. Plantain may remain on the farm from the first to the sixth year. Signs of plantain failure are smaller bunches and fingers and the absence of new suckers shooting from the base. As soon as these are visible, the farm is neglected. The land is fallowed for different periods and may turn into secondary forest. When the land is fallowed for longer periods of say five to ten years or more, plantain is planted again. If the fallowing is over a short period of say two to four years, maize is cultivate on the site on alternate years for six years. Maize may be interplanted with cassava in the last year after which the area is fallowed again.

The choice of the crop to be grown is a matter for the individual farmer to decide. The main consideration is the demand for a crop and the time taken for returns to start coming in. At Subi, the main aim of farmers is to get the highest and quickest return from all money invested in farming. Even in the sale of maize, the earliest crop fetches the best price and the very last crop to be sold at any planting season also reaches a good price. The practice in Subi is to plant maize early and also to delay sales until later when prices improve.

At Otumi, the amount of maize cultivated is relatively small, the emphasis is on plantain, cocoyam and cocoa. For the present, the returns on the farms may not be as high as Subi. Maize and rice take about four months to mature and two crops are possible in a year. On the other hand, cocoyam and plantain take over twelve months to mature and, for sales to be important, farms must be big enough to satisfy household needs and still have enough to sell. Maize is not a staple food of the Akims and so the larger part of what is produced is sold.

Much may be said about the varying income sizes of farmers at Subi and Otumi but to my mind the short term return does not matter as much as the long term. The value of any farming land increases with developments carried out on it. At Otumi, the development of the land is in the re-establishment of old and abandoned farms (with some less good new planting of cocoa). In the long term, this type of farming will be advantageous because the improvements made on the land do not destroy the natural vegetation of the area.

Subi's farming system produces a crop which gives a quick return in cash without considering the effect this system has on the land in the long run. The land is being "opened up" and exposed yearly as fallowed areas are put into cultivation. A walk through the bush at Subi will quickly reveal that large tracks are exposed by this farming system. One wonders if this area will not look like areas around Nsawam and Adeiso if this is not checked and a new farming system developed.

Livestock does not play any role at all in the farming system of the area. At Otumi, except at the Zongo, no sheep or goats are allowed in the village for sanitary reasons. The number of chickens owned by a household does not exceed ten. At Subi, sheep and goats are allowed to roam during the day in search of food; in the evenings, they are found taking shelter under the eaves of houses and on verandahs. The livestock population does not exceed 100.

My Observations.- The very loose land tenure system has resulted in individual farming lands being widely scattered. There is a desire to learn new farming techniques and to plant new crops if advice is offered and a market found for the crop. This simply means that the extension services offered are inadequate. Third and last, the indiscriminate use of land for crops which could have been planted in other areas of the country profitably is undermining the forest structure. (What is needed inter alia is a better overall agricultural policy worked with price incentives, roading programmes, land use and extension. Quao has been following the general lines of our discussions in these paragraphs FRB).

Acknowledgements

Mr. J.K. Jecty chose both the villages and the farmers to be included in this survey. The choice proved a most happy one and the significance of this survey derives from the comparisons that can be made in Otumi and Subi farming systems. Mr. Jecty initiated the actual recording of information but was soon relieved by Mr. M. Quao, who has proved a most willing, accurate and reliable field recorder who has provided a very competent description of the farming patterns of the area.

Both these assistents as well as Mr. Nodzievor in the Northern Survey show conclusively that advanced education is not by any means the complete solution to training for agriculture. None of these assistants nor indeed B.M. Agyare in the West Ashanti survey had anything beyond a middle school or secondary education. Yet in powers of observation, in the substance of their work, reflecting the world around us, they are superior to the products of the University. Book knowledge is not a barrier separating them from reality.

F.R.B.