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OCCASIONAL PAPERS

Labour and Development

An analysis of the time-budget and of the production and productivity of Lime Farmers in Southern Ghana.

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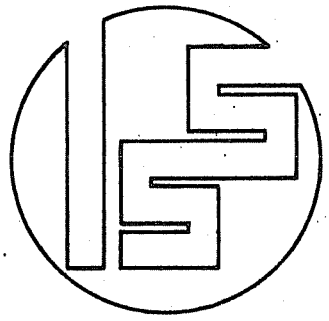

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Chapter I
I N T R O D U C T I O N

Forty years ago the growing of lime fruit was introduced in the Asebu-Abura Traditional Areas in Southern Ghana. The reaction of the farmers was certainly not a positive one, which does not surprise us considering the fact that the crop was introduced to the farmers with the technological and economic concepts of a different economy, namely that of the industrialising countries, without offering the farmers possibilities of a similar economic and institutional framework and overlooking the socio-economic and institutional environment the farmers were working in.

The farmers were living in an almost complete subsistence economy. Only the sale of part of the surplus of their foodcrops as for example yam and cassava, brought some cash income to them. None of their foodcrops was purposely cultivated for the market, and although varieties of wild citrus fruit were growing in their environment, lime fruit as a pure cash crop, i.e. a crop only cultivated because there existed a demand for it on the market without the cultivators having any use for it, was totally alien to the farmers' society. Consequently the initiators, who introduced the lime fruit and whose ability to perceive the distinguishing characteristics of this society was low, encountered a number of difficulties. (These initiators are not alone in this respect; see for a systematic evaluation of agricultural projects in Africa, e.g. De Wilde, John C., *et al: Agricultural development in Tropical Africa, Vol. I and II*, 1967.)

Farmers had to be convinced, sometimes forced, to start the cultivation of lime, and the techniques which were thought to be necessary for the growing of this crop had to be explained to the farmers because these were unknown to them. Another constraint was that the farmers were not used to the type of management that goes with this crop, and certainly the time lapse between the actual planting and the first yield (four or five years) proved to be beyond their planning experience. Nevertheless, the farmers started to grow lime trees because the opportunity of earning some cash income would enable them

to improve living conditions and to purchase desirable goods. But during the first and second decade it certainly was not a flourishing industry, especially since the techniques introduced proved to be inadequate considering firstly the prevailing factors of the physical environment, secondly forms of land-use and labour input, thirdly because the demand of the processing industry established in Abakrampa (later on moved to Asebu) was not as stable as promised, and finally because the lime fruit proved to be susceptible to the Tristeza disease (dieback disease) which made the risks involved too high. Together these factors almost destroyed the industry at the end of the forties.

Fortunately, however, a new variety of lime resistant to the attacks of dieback disease was developed and with the help of the government about 2000 acres were rehabilitated. The farmers developed a new technique for growing the lime tree, a stable and increasing demand was shown to exist and an increase in its price changed the conditions under which the farmers had to produce so that the industry began flourishing. The society was on its way from a subsistence to a market economy.

The area under lime tree plantation increased from 300 acres in 1928 to about 4000 acres in 1967. From labour in the factory and from lime fruit supplied, an amount of more than N¢300,000.00 flowed into the Lime Farmers' Area in 1967.

As indicated above, the farmers were able to adapt an originally alien crop--lime fruit--to their economy, changing their way of farming rationally, considering the opportunities existing in their society. The limiting factor for further development, according to the farmers, is labour. It seems that putting in more labour to extend land under cultivation or intensifying labour on the existing farms by more weeding and pruning, allowing a larger spacing of trees which will give higher yields, better quality of the fruit and longer life span of the trees, is impossible because it is not available. For the same reason the farmers are not willing to consider labour--and money--consuming techniques as spraying and fertilising. The farmers are certainly aware of the fact that these factors could effect an increase of their production, but

at the same time they are convinced that on the one hand the yield will not be worth the investment, and on the other that the labour required does not exist. Surveying the present way of cultivation of lime fruit, we observe that the forest is still cleared in the traditional way, the spacing of the trees is arranged in such a way that weeding is limited as much as possible, no attention is paid to quality of trees and fruit (because the processing industry does not require fruit of a special quality), there is no pruning of the trees and insecticides and fertilisers are not applied. Almost all farmers have learned a new technique, viz. grafting of young lime seedlings; if not applied this would mean growing a kind of tree susceptible to the dieback disease and this would mean the end of the industry. A change in their way of farming is the adoption of a different kind of planning and the acceptance of the necessity of capital investment in agriculture: the farmers invest 9 NP or 10 NP per lime seedling, realising the first profit only four years later when the trees start bearing fruit. In order to tide over the time-span of four years the farmers intercrop their young lime farms with foodcrops, which are either used for cash income or for subsistence. One can also argue that the cultivation of lime fruit was instrumental in the introduction and acceptance of wage labour.

Innovations are accepted with care in order to avoid risks and in order to avoid disturbances of their economically well-balanced way of farming. The introduction of lime fruit disturbed this balance, but the farmers were able to restore it by adapting the requirements of growing lime fruit to their knowledge, experience and to the changed opportunities. The rural society developed under the influence of an increase in production brought about by extension of land, putting in more labour, and adapting farming methods to the change in socio-economic and institutional conditions. One question that comes to mind is how long the farmers can continue to use land and labour in this extensive way and escape the necessity of creating agricultural capital. In the Lime Farmers' Area there are indications that bringing more land under cultivation becomes increasingly difficult in certain cases and the farmers

are also all complaining about the high labour input needed for further extension of their lime farms--so high that it becomes virtually impossible for the average farmer to extend his lime plantations beyond one thousand yielding trees. If this is true, further development building upon the introduction and increase of lime production will fall off. This paper deals with this problem, and will try to find an answer to the question whether, considering the present time budget of the Lime Farmer, there is room for further development through an increase in production by means of a higher labour input. Time budget refers to an inventory of all farmers' activities during a day and the time spent on each activity observed over a period of 12 months. If the answer to this question is that there is certainly time available which is not at present used for economic purposes, we might wonder why this time should not be used for more labour input in the lime industry. If the answer, however, is that the farmer is fully occupied, the question arises:what should be changed? Will the farmer change the organisation of his labour in order to increase his output? Will he improve his farming methods and techniques? Or both? But an even more intriguing question is whether factors in the socio-economic and institutional framework have to change before this can happen, and which factors are able to initiate this change.

In order to answer this question, the time budget of a number of farmers has been investigated through daily observation and interviewing. In an effort also to grasp the qualitative aspects of labour, the produce of the farmers' labour was measured each time the farmer harvested some of his crops, so that the productivity of the farmer can be expressed in terms of product per man-hour.

The following is based upon the preliminary analysis of the data collected. In Chapter II the method of study will be introduced; in Chapter III we will study the survey of the time budget of the male and female farmers cooperating in this study, and in Chapter IV the production and productivity of the most important crop of this area--lime fruit--will be analysed.

Chapter II
METHOD OF RESEARCH

This chapter deals with the method of research which was applied to collect the data for the purposes mentioned in the introduction. What follows will be an account of the collection of data and the selection of the village and the farmers. This has to be a rather detailed account, not only in order to show the reader the degree of representativeness and reliability, but also to make the data available for comparative studies. In a number of studies of labour input this detailed information is lacking, and therefore the results of these studies do not allow ready comparison with other studies. Another reason is that not many studies of this type exist--in fact only one study of farmers' activities conducted by an FAO team is known--and so some readers might be interested in the difficulties involved and the possibilities of studying daily activities of farmers.

Data collection

One does not need to be in close relationship with farmers to appreciate that each day and season shows a different set of activities. Only close observation over a period of at least twelve months can provide insight into the daily and seasonal features. But even then daily observation of a farmer will not give us insight into, for example, the destination of the farm produce, because someone else (in most cases his wife or wives) will take care of the marketing of the products. This raises the question whether we should include the farmer's wife or wives in our observation.

We found an answer to this question during the preliminary investigations, which suggested that the farmer and his wife/wives were working in one operational unit regardless of any division of labour we might trace between the sexes. This made it essential to include the wife's activities over a period of twelve months in our observations.

These considerations indicate that in order to get a detailed insight into the daily activities of the farmer and his wife/wives, an observation *and* interview schedule had to

be designed. In actual fact, two interview schedules were made: one with regard to farming activities, another for the days on which any produce was sold in the market. For detailed information on these schedules we refer to the Appendix. Another decision which had to be made concerned the number of farmers to be observed and interviewed by one observer. The ideal situation, of course, would be to have one observer per farmer. But, even for a small number of farmers, such an investigation would involve a considerable investment in terms of manpower and money. As we had only limited resources available in this respect, we decided to employ one observer per farmer and his wife/wives.

The daily routine of the observers was as follows: for every day, regardless of the farmer's activity a time schedule had to be filled out, and if the farmer mentioned any farming or marketing activity, the interview schedule related to these activities as well. The male and female farmer were visited separately. During the first month the observer accompanied the farmer or his wife daily with the exception of Fridays, Saturdays and Sundays. These (Sunday excluded) were used for revision and the first processing of the data collected. After this initial period of very close observation, the farmer and his wife/wives were observed each only once a week for a whole day so as to judge whether there were any inconsistencies between the information collected through interviewing and that gained by observation. This check proved to be quite sufficient as hardly any difference could be traced. The days on which the observer did not accompany the farmer were used for further processing of the data collected, and of course for the daily interview which usually took place in the early evening hours and which lasted for about 15 minutes.

Towards the end of the observation period each of the farmers was interviewed on their background, their views on farming, including their ideas about yields and income during the past year, on their future and the future of their children. The answers to questions about yields and income are of special interest, because they can enlighten us as to the reliability of information collected in this way, if we check these data against the data collected through daily

observation and interviewing.

Selection of village and of farmers

In studies on farmers' activities there seems to be a conflict between the grade of reliability and representativeness of the data on farmers living in a particular area[1]. On the one hand, one wishes to study the farmers as closely as possible--which means through daily observation--and over a period of a year or longer in order to be able to ensure that the data collected reflect reality. On the other hand, there is the tendency to cover a large number of farmers through sampling methods in order to ensure that the data represent patterns of activities in a distinctive area large enough to be of importance for the study of agriculture in Africa. For a researcher to combine both criteria inexhaustible sources of manpower and funds would have to be available. Because these do not exist, very often the researcher opts for one of the two possibilities, accepting the risk of being accused of either unreliability or unrepresentativeness.

In this study of farmers' activities we try to combine both options, by selecting one village which can be assumed to be representative for the whole Lime Farmers' Area in Southern Ghana, and by a daily observation of a small number of farmers in that village selected from a typology of farmers. After having given the reasons for the study of a small number of farmers which can be assumed to be representative for all Lime Farmers, we now turn to the discussion of the selection of the village and the farmers themselves.

At the very beginning of our preliminary investigation[2] into the effects of the introduction of a cash crop in a subsistence economy, a number of intensive reconnoitring trips throughout the Lime Farmers' Area were made. Based upon this preliminary survey, three villages were selected for the first survey of the Lime Farmers' Area in such a way that spatial variations existing in the area would become manifest. These villages were: Bando, the most north-westerly collecting station for the lime fruit, linked with the main Kumasi-Cape Coast trunk road by an untarred road, which was in a bad condition especially during the wet season; Nyanfueko Akrofur, a

few miles north of the factory on the main Kumasi-Cape Coast road; and Old Ebu, a few miles to the west of the factory, linked with the main road by a relatively good untarred road. Each of these villages proved to have its own peculiarities, but there existed a high degree of consistency between the villages on the crucial questions concerning the socio-economic conditions. This leads us to the conclusion that there are no relevant differences between the villages in the Lime Farmers' Area in their reaction to the introduction of the lime cash-crop into their subsistence economy. For further detailed studies, any of these villages could have been selected in the knowledge that conditions prevailing in that particular village could be assumed to be representative for the whole Lime Farmers' Area. For practical reasons, Old Ebu became the village of our choice.

This brought us to the next step, namely the selection of farmers. As mentioned before, it is not possible to include a large number of farmers in the study. The number had to be small while remaining as representative as possible for the whole farming population. From the preliminary investigation, we learnt that there is a social stratification among farmers based upon their proficiency as farmers, which is different from the hierarchy among people in the town based upon authority. We have come across many instances of a man who can be considered to be doing rather well in farming who does not have any say in village affairs. On the other hand, it is undeniable that in certain instances there exists a relationship between traditional authority and the size of farming activities of persons in this authority. This holds especially for those traditional authorities who have authority--though not exclusively--over land like the chief of a community over stoolland and the family or clanhead over family land.

We discovered that a person's position in the social stratification depends upon four criteria: the number of lime trees in his possession, the quality of his house, the quality of his clothing and the education of his children. In other words, we discovered a social stratification based upon property and not upon tradition. With these criteria available, we classified all but one of the full-time farmers in Old Ebu.

(One of the farmers was excluded as he belonged to the leisure class of farmers.) The stratification of the population on the base of different criteria has been opted for in order to reduce the variability within each stratum. According to the farmers' scores, we can divide them into four groups:

1. Big farmers	: 4
2. Above Average Farmers	: 10
3. Average Farmers	: 20
4. Small Farmers	: 11
Total full-time farmers	: 45

We could now make our choice, and we decided to select one farmer from each group, with the exception of group 3, from which we included two farmers. Two farmers selected had two wives each, and during the period of our study one of them married a third wife, and another farmer married his second wife. These wives were included in the study from the moment they entered into this new relationship with the farmer selected. By selecting farmers from the strata in the classification the selected farmers represent a type of farmer prevalent in Old Ebu. As it has been shown that the socio-economic situation as a result of the reaction to the introduction of the cash-crop lime in Old Ebu is not different from the situation in other villages in the Lime Farmers' Area, we assume that the selected farmers are representative for types of farmers prevalent in the whole area.

The five farmers and their wives (fourteen persons in total) were studied by a team of five middle-school leavers (all from Old Ebu), under the direct supervision of a field assistant (a graduate of the University College of Cape Coast), for the period of a full year, starting in September 1969 and ending in August 1970. Each observer/interviewer studied one farmer and his wife/wives.

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1 See e.g. E. Boserup, *Woman's Role in Economic Development*, 1970.

2 See Brenner, Y.S., and Wagenbuur, H.T.M., Lime Farmers. A Case Study of a Cashcrop in a Subsistence Economy. Research Report Series No. 1 of the Social Studies Project, University College of Cape Coast, Cape Coast, 1969.

Chapter III

A TENTATIVE ANALYSIS OF THE TIME BUDGET

General

Before we can discuss the daily activities of farmers in our sample the reader must be familiar with the general pattern of activities among Lime Farmers and in particular among the farmers selected. We, therefore, will first discuss activities in general and introduce the five farmers and their wives before we bring the time budget in discussion.

The composition and function of the crops which had been cultivated before the introduction of the lime fruit changed under the influence of the growing of lime and the changing demands of and the easier access to markets through improvement in transport. Before the lime growing began the farmers were cultivating their land with the primary aim of subsistence. Only part of their yam yield was sold to the markets along the coast and in Kumasi. According to the old farmers questioned on this point most of the farmers had between 100 and 200 tubers a year, of which about 50% was marketed. Of the cassava only a small percentage was sold, but a more precise picture is difficult to give because it seems that cassava was planted for subsistence, and only when the weather conditions in a particular year were favourable could part of the yield be sold. All the other crops were subsistence crops and the result of hunting supplemented the diet.

At present hardly any yams are grown and because farmers cleared almost all the forest in their need for land, the natural environment of the animals was destroyed and hunting ceased to be a source of food. Of the other food crops, about 50% of the cassava is cultivated to be marketed or to be manufactured into garry in the home industry; almost all corn is used to make kenkey, and both garry and kenkey are sold in the markets along the coast or the nearby markets of Asebu and Abakrampa. Groundnuts and tigernuts are cultivated exclusively for the market, while the surplus of tomatoes, pepper and garden eggs is also sold. The women in particular, although not exclusively, derive their cash income from the

proceeds of these crops and products, whereas the lime fruit is taken care of by the men--but not exclusively. Occasionally, farmers are able to acquire a contract to clear an old palm plantation for the purpose of tapping palm wine. Few farmers have cocoa plantations or grow tobacco. In two villages farmers produce sugarcane on a cooperative base. Sometimes farmers derive additional income from the sale of Akpeteshie, or running a bar or petty shop. There is hardly any specialisation, but rather a strong tendency to diversification: all farmers are lime farmers, their second most important crop being cassava, and all of them are trying to find an additional source of income in order to escape the dangers of monoculture. It is notable in this respect that the question most frequently touched upon during our discussion was whether any crop other than lime could be cultivated as a cash crop. Farmers very seldom thought of the traditional food crops as potential cash crops; agricultural growth is expected to occur in other than the traditional crops. We found very few instances of farmers who, wishing to avoid monoculture, turned to the commercial production of these crops.

The farmers selected

The Big Farmer is the only farmer who derives his entire income from the proceeds of his farming activities. He is in the possession of a Middle School Leaving Certificate, 48 years old, married with one wife and 8 children, all attending school.

The Above Average Farmer runs a bar in addition to his farming activities. He is not educated, about 40 years old, married with two wives. The Average Farmer No. 1 owns a cocoa farm, situated about 20 miles from Old Ebu, and acquired an old palm plantation for palm wine tapping in addition to his farming activities. He is not educated, married with three wives and 21 children of whom 4 are educated. The Average Farmer No. 2 sells akpeteshie in addition to his farming activities, is about 30 years old, has a few years formal education, married with two wives and three children, one attending school, others below school-going age. The Small

Farmer runs a charcoal business in addition to his farming activities, is 35 years old, not educated, married with one wife and two children, both below school-going age.

Time budget of male farmers (table 1)

A. Productive activities

The average number of productive hours of a lime farmer is nearly 160 hours per month (month = 720 hours). Estimating that a farmer works 20 days a month, this means 8 hours a day. To a certain extent this picture is misleading, because farmers do not have regular working hours as is possible in other occupations. In actual fact, hardly a day passes without some time spent on productive activities. Formerly the usual days on which the farmer did not spend any time on productive activities were Tuesdays, Fridays and Sundays. Our observations taught us that farmers still observe the 'tabu' days, Tuesday and Friday, in the sense that they will not clear the forest or weed on those farms where it is forbidden by custom. But they will certainly go there to collect lime fruit, work on the lime seedlings, or harvest any of the other crops. On Sundays, the farmers feel free to do any job that may be necessary. Other days on which the farmers will not usually spend any time on productive activities are days on which they have to attend funerals.

With the exception of the working hours of the Small Farmer, the sub-totals of the other farmers show a ranking order related to the category of farmer. The reason for the exceptionally high sub-total for the Small Farmer is probably the fact that this farmer hires himself out as a farm labourer. We will now study the breakdowns of this section to see whether this picture is also reflected in the sub-divisions of the productive activities.

1. Farming activities

The average number of working hours per month in farming is 82.69 hours as can be seen from the Time Budget of Male Farmers in table 1. Compared with labour inputs among farmers in Africa and Asia, the labour input of the Lime Farmers is

about the same as the highest input among African farmers and the usual input of the intensive subsistence farmers in Asia (cf. E. Boserup, *Woman's Role in Economic Development*, 1970, pp. 21 and 25). This is even more true if Walking and Preparation hours are included. There seems to be no correlation with the rank of the farmer or size of the farm. The difference in labour input in farming would be clearer if family and hired labour could be included. (This will be done in a further analysis.) The Average Farmer No. 1 has a higher input of labour in farming than the other farmers because he achieved diversification of his productive activities not in non-farming activities as is the case with the other farmers, but in cocoa farming. He succeeded in establishing this cocoa farm because through one of his marriages he gained access to land on which cocoa could be cultivated. Concerning the high labour input of the Small Farmer, we have seen already that this concerns a disguised labour input on somebody else's farm.

2. Non-farming activities

With the exception of Average Farmer No. 1, the farmers spent between 30 and 40 labour hours on non-farming activities. One must, however, keep in mind that these non-farming activities are different for each farmer. We should mention here that some non-farming activities of the Big Farmer are closely related to his farming activities, namely, the processing of his agricultural products into food products. Besides these, he spends a considerable amount of time on the construction of houses for his children and wife. The main non-farming activities of the other farmers concern the running of a bar, selling of akpeteshie and charcoal. The relatively small number of hours the Average Farmer No. 1 uses for non-farming activities is obviously related to the high labour input in his farming activities. We must not conclude from this rather low labour input in non-farming activities that the palm wine business of this farmer does not involve much time. On the contrary, this business is a highly time-consuming activity, but because the farmer himself does not

have time available, hired labour is used for the palm wine tapping.

3. Market activities

The average number of hours farmers spent on market activities is 5.85 hours. The most important market activity which the farmers are engaged in is the selling of the lime fruit to Rose's Lime Co. at Asebu, about 2.5 miles from Old Ebu. The Company offers free transport from certain collecting points along the road to the factory. The waiting time for the lorry, which results sometimes in a waste of many hours because the lorry does not come on schedule, the ride to the factory and the walk back home are included in Walking and Preparation. The hours in the column 'Market' are the time spent at the factory while the farmer is handling the fruit. The variation in labour input in market activities from 12.96 to 1.52 hours can be explained by the fact that some farmers do not always go to the factory themselves, but leave this to their wives and by relating it with the size of their lime farms.

4. Walking and preparation

Walking and Preparation have been included in the Productive Activities because these activities are directly related to the farming, non-farming and market activities respectively. Variations in time spent on Walking and Preparation are most probably related to the distance between Old Ebu and the place of activity. We do not know enough about this to discuss it in detail, but we would like to make an exception of one interesting feature, viz. the fact that Average Farmer No. 2 used only about half of the time the other farmers spent on Walking and Preparation in connection with farming activities. The explanation is that this farmer owns a bicycle and uses this vehicle to convey himself to his land, which is located so far away that it cannot be regarded as being within walking distance. This unfavourable location of his land forced the farmer to use a form of transport to his land which is unusual among lime farmers. The interesting aspect is that it not only enabled him to cultivate land which otherwise would have been beyond the range of possibility, but also that

it resulted in his spending far less than the average time needed for Walking and Preparation! The question arises now, what is the farmer going to do with the extra time available?

B. Domestic Activities

Concerning the time devoted to Domestic Activities, a few observations can be made. First, the farmers seem to need a rather large number of hours for sleeping (almost 9 hours per day). Most probably this is needed because of the hard work on the land and relatively poor food they eat and their not optimal health conditions. It would be interesting to find out whether farmers spent less time sleeping in a village with electricity. A second observation concerns the hours for leisure. Whereas an average of 3 hours' leisure daily throughout the years seems to be reasonable, it puzzles us that the Big Farmer clearly uses only about half of this time for leisure. Is he working too hard? What are his motivations? Is the leisure of the Big Farmer reasonable, and do the other farmers attach more value to leisure? Is he able to spend more money on food and medical care and does he need therefore less leisure? Our data have to be analysed further to get insight into this aspect of farmers' life. Further, an observation can be made on time lost for medical treatment. "When you are lucky and do not fall ill it saves you a lot of trouble and money," a farmer said to us, and he should know because he was losing an average of about 11 hours per month, had to organise help for his farms, and 15% of his total yearly expenses were for medical treatment by private doctors in Cape Coast, after having tried native and government doctors. Three of the farmers lost a considerable amount of time on medical treatment. It is not easy, however, to detect how this influenced their productive activities.

C. Social Obligations

The farmers spent an average of about 65 hours per month fulfilling social obligations. Almost all hours coming under traditional social obligation concern attendance at funerals, and hours under non-traditional social obligation refer to

attendance at religious services. As explained above, typical days on which farmers may not do any productive work are days of funerals. It is, therefore, more interesting to find out how many days per month have to be spent on these functions. While this remains to be analysed, it is again notable that there is so much variation among the farmers in time devoted to social obligations. Again, one might wonder how this is reflected in the time spent on other activities. A guess would be that the Small Farmer who does not have so many obligations as the other farmers can make his time more productive by putting more time into farming activities, though one could also argue that he enjoys more leisure.

To sum up the preliminary analysis, the most striking feature of the male farmers' activities is the high average labour input per month. There seems to be hardly any time left for further productive activities, *ceteris paribus*. One could further observe that there is a great variation among the farmers as to time spent on their productive and domestic activities, as well as on their social obligations.

Time budget of female farmers (table 2)

We will again discuss the Productive Activities first, followed by the Domestic Activities and Social Obligations, and compare the results with the activities of the male farmers.

A. Productive Activities

The average hours per month spent on Productive Activities for the female farmers is 141.76 hours, which means the average of a 7-hour working day for 20 days per month. As we may expect a much higher labour input in the household activities compared with the male farmers, this figure is amazingly high. A difference from the male farmers is that the variations in total labour input in Productive Activities seem to be more closely related to the ranking of the farmers. The wives of the bigger farmers show a higher labour input than the wives of the smaller farmers. This, however, is still not reflected in the sub-divisions of the Productive

Activities. There, we see great variations which are not related to the rank of the farmers. These variations give us indications as to the extent to which the farming activities of the female farmers are commercialised. Some female farmers, as, e.g., the wives of the Above Average Farmer, do not, or hardly, spend any time on non-farming and market activities. This probably means that their farming activities concern the growing of food crops for subsistence of the family, and assisting their husband on his farms. Others, on the other hand, as, e.g., the wives of the Big Farmer and Average Farmer No. 1, spend a considerable amount of time on their farming activities, and they devote a large part of their non-farming activities to processing the output of the farming activities into garry and kenkey and to the marketing of the output of both their farming and non-farming activities.

B. Domestic Activities

The sub-total column of the Domestic Activities (table 2) of female farmers shows a higher average per month number of hours (532.53) than that of the male farmers (495.38, table 1). The small difference of 36.15 hours is surprising because one would have expected a larger margin, the women being fare more involved in all domestic activities and bringing-up of children. The use of the number of hours in the sub-total column gives a false impression in this respect. On the one hand, these domestic activities are to be found in the column 'Household' (and one then sees that there is this striking difference one would expect: 171.48 hours for female farmers versus 64.19 hours for male farmers). On the other hand, women have a considerably less number of hours available for leisure (48.20 vs 103.18) and to some extent for 'Rest' (40.48 hours vs 59.27 hours).

In general the wives of the bigger farmers spend less time on Domestic Activities than the wives of the smaller farmers. In other words, there is a relationship between hours spent on the Domestic Activities and the rank of the farmers. In the discussion on Productive Activities we traced already a relationship in terms of a higher participation of wives of the bigger farmers in Productive Activities than the wives

of the smaller farmers. The wives of the bigger farmers have especially less time available for Household and Leisure. The fact that the wives of the smaller farmers in our study had young children only and could not make use of other children or relatives (as the wives of the bigger farmers) to take care of certain household activities plays of course a role. On the other hand, the resources available to their husbands influence the scope of the activities of the female farmers and similar observations about food and health (as discussed under the Domestic Activities of the male farmers, see p.15) could be made.

C. Social Obligations

As it appears in table 2 the average per month number of hours spent on Social Obligations is 45.64 hours. Studying the breakdown of this sub-total column one could see that there is clearly no relationship between the ranking of the farmers and the amount of time spent on social obligations. Female farmers spend less time on funerals than the male farmers, whereas they devote more time to religious functions. In general, female farmers spending less time on religious functions have more time available for leisure. A notable exception is the wife of the Big Farmer, who has hardly any leisure time, nor time to go to the church.

To sum up, female farmers are putting a relatively high amount of their time into productive activities. There is no time left over to increase this labour input, *ceteris paribus*. By relating the farming activities to non-farming and market activities we might be able to trace the degree of commercialisation of their farming activities. The female farmers devote a much smaller portion of their time to leisure than the male farmers, but they spend a longer time in the church.

Chapter IV
PRODUCTION AND PRODUCTIVITY OF LIME CULTIVATION

The analysis of the time budget gave us insight into the amount of time the farmers devote to their productive activities, but it did not give us any clue as to how the farmer is using his time while productively active. Can we say anything about productivity and efficiency? Which factors are influencing the result of his labour? At the present stage of analysis of the data collected we are able to have a closer look at the factors influencing the productivity of lime farming.

To calculate the productivity of limes, we measured the production of lime-fruit in numbers of boxes (farmers bring their fruits in big bags to the factory where the fruits are put in boxes, each bag giving about 3.5 boxes weighing about 53 lbs.). The yield of lime-fruit is influenced by seasonality and intensity of precipitation. It is relevant, therefore, to compare yearly figures so as to find out whether the year of the observation was normal or exceptionally bad or good. Unfortunately we were not able to collect the exact figures, but according to sources from amongst the farmers and in the factory the years 1969 and 1970 could be considered normal years in terms of total production, including the yearly increase. We assume, therefore, that our figures are not exceptional and reflect normal production.

As we are interested in testing whether more time could be devoted to agricultural production, we measure productivity in terms of production per man/hour.

The labour activities we measured and included in this productivity rate are connected with the mature trees only: viz. weeding of the lime-farm, collecting the fruits and carrying these to the roadside or collecting station, from where the truck of L. Rose and Co. conveys them in bags to the factory. Since we were considering only the mature trees, and assuming that the farmers did not buy the seedlings, we could not include time spent on nursing seedlings, on transplanting and on preparation of the new lime-farm, firstly because these activities took place many years ago (i.e. at

least five), and secondly because we could not assume that these activities consumed the same approximate number of labour-hours each year (farmers do not plant young trees every year). Another problem in measuring the time devoted to cultivation of lime trees arises when one tries to include the labour hours spent on weeding of the young lime-farm. This is not always done: sometimes the farmer leaves the young lime-farm to the natural elements, which means that the young trees are overgrown in a very short time. It is difficult to tell when this happens, whether it was through bad management, because something unexpected prevented the farmer from maintaining his farm or because the farmer found it difficult or was reluctant to invest more time and money in his lime-farm. Normally the young lime trees are intercropped with food crops and the farm is weeded regularly. This multipurpose weeding is regarded by the farmers as weeding of the foodcrop farm. We followed them in omitting labour-hours devoted to weeding of the lime/foodcrop farm from the labour activities connected with the mature trees, for the same reasons as given for disregarding the time devoted to lime seedlings.

In table 3 labour hours in lime farming by sex and by collecting/carrying and weeding, the total production and the production per man/hour in boxes are listed.

Three groups of people working on lime farms can be distinguished: men, women and children under the age of 15 years. It is obvious that children have to be distinguished from the other groups as their output is about half of that of an adult. There are two reasons for making a distinction between adult male and adult female workers. In the first place, because there is a division of labour between the sexes. It is clear from the table that this is the case in weeding, which seems to be the work of men exclusively. Farmers and their wives claim that weeding is too heavy a job for female workers. Whether this is the only explanation possible has to be studied in a further analysis. Secondly, in the case of collecting/carrying two different kinds of management decisions can be observed, which makes it important to distinguish between male and female workers. Some farmers use men exclusively

for carrying. Their reasoning is that, although male labour requires a higher investment per day than female labour, the output of male labour is relatively so much higher that it is worth the investment. Other farmers, on the other hand, although aware of the higher output, were not able or reluctant to invest more than the minimum capital in labour. A factor which plays a role in this respect is the perishability of the lime-fruit. If the fruit is stored in a bag for longer than 2 or 3 days (depending on whether the fruit has been put in a bag dry or wet) the quality deteriorates so much that the farmer might have difficulties in selling his product. When the farmer knows that he has to collect so many bags of lime-fruit that female and children labour will take more than two days to collect and carry it to the roadside or to the collecting station he has to decide to use male labourers or otherwise run the risk of trying to sell a low quality of fruit.

Collecting and carrying of fruit are taken as one entity, because the particular forms of organisation of labour prevents to make a clear division between these two aspects of the lime production. Sometimes the farmer decides to collect first of all the fruit he wants to sell and then to carry it to the roadside or the collecting station; sometimes one group of labourers is collecting while another group is responsible for the carrying of the fruit; and sometimes the farmer lets one man or woman with or without the help of children collect enough fruit for one bag and has this bag carried to the roadside or the collecting station before he or she is allowed to start the collection of fruit for the second bag. For these reasons time spent on collecting the fruit and carrying it was recorded as one entity: collecting/carrying.

The average production per man/hour is 1.21 box of lime fruit (see table 3). What interests us first of all is whether we can find reasons for the differences in production per man/hour between farmers in the sample. (Further analysis of our data will be necessary before we can say more about the income derived from this production.) In Chapter III we discussed the amount of time spent on his different activities,

but we do not know how the farmer uses his time and how he uses his productive time especially.

In the following, we will discuss the most important factors influencing productivity and analyse these factors in their relation to labour, because in this way we hope to get some idea about the efficiency with which the farmer works. Two sets of factors can be distinguished: (a) factors related to management, namely, ratio: female/male labour, ratio: weeding / collecting and carrying, ratio: number of trees/ labour hours, spacing of trees, age of trees; (b) factors related to the ecological conditions, namely, soil conditions and micro-climate (see table 4). In mentioning these factors we do not want to suggest that each of these factors are decisive for productivity, but taken together the relationships might show us how productivity is influenced.

Below, relevant data over and above the data in table 3 are listed as follows:

Table 5

Category of farmer	No. of mature trees	Date planting	Spacing of trees
Big	1000	1954-57	12 - 15 ft.
Above average	800	1960-62	8 - 12 ft.
Average 1	500	1959-60	10 ft.
Average 2	550	1955-61	10 ft.
Small	300	1965	8 ft.

Ratio: female/male labour

In the lime-industry only men do the weeding, whereas both men and women collect and carry the fruits to the roadside to be collected by truck. We have assumed that there will be no difference in productivity for one hour's collecting between men and women. But for carrying the fruit we accept a difference in output. Each farmer has his own reasons for putting in a certain number of men and women. The ratio between these inputs might influence the output, in that the female labourers are mostly employers' own wives or adult daughters, whereas

the male labour is mostly hired labour working for a fixed price per bag collected and per bag carried.

Ratio: hours weeding/collecting and carrying

In the introduction we mentioned that farmers adapted the cultivation of the crop to the conditioning factors in their environment. A case in point is the question of the spacing of trees. The official recommendation was a spacing of 18 feet, later on changed to 15 feet. The farmers, however, experiencing an unwelcome increase in labour for weeding, experimented with very close spacing (7 or 8 feet). This spacing then proved to be cumbersome because the farmers had to cut a way through their lime plantation to collect the fruit, and this required extra manpower and influenced the yield unfavourably. The farmers' reaction was then to space the trees at a distance of about 10-15 feet, which seems to be most commonly used now. But still not all the farmers are convinced of the success of this adaptation, as we see from the table. The question now is whether this factor influences productivity.

As we see from table 4, there is a remarkable variation in the ratio: hours weeding/collecting and carrying. We had thought that the amount of weeding was determined by the spacing of the trees, but although spacing appears to be an important factor we must also include in our discussion the element of management-decision by the farmer, otherwise we cannot explain why the Big Farmer using the widest spacing spent far less time on weeding in proportion to other labour activities than the Average Farmer 2, whose trees were planted closer together. We would have expected the reverse. The Big Farmer is limiting his weeding as much as possible because, according to him, it does not pay--in other words, the cost of higher labour input outweighs the increase of production, if any. Average Farmer 2, however, expects his hard labour to pay. The farmer has the image in the village of a hard-working man. Because he weeds more frequently, he had less difficulty in picking his fruits, and consequently can spend less time on this activity than, e.g. the Big Farmer. This leads us to the conclusion that the ratio between weeding

vis-à-vis collecting and carrying might give us some insight into this relationship.

Ratio: labour hours/number of trees

The range of productivity from 1.41 box per man-hour with the Big Farmer to 0.68 per man-hour with the Small Farmer (see table 3) suggests that there might be a correlation between the size of the farm--i.e. the number of trees-- and productivity. Although as yet we do not know enough about all aspects of lime-farming to pronounce definitely on the economics of scale and marginal productivity, we assume that labour increases relatively per number of trees.

Age of trees and spacing of trees

Lime trees have a life-span of about 17 years, with highest yields between 8th and 15th year. This might not be the case with trees planted very close together (8-10 feet and closer): experienced farmers suggested that trees planted at distances of 12 feet and more may give slightly higher yields and have a longer life (see Brenner/Wagenbuur, p. 13). By studying the dates on which the farmers in our sample planted their trees, we may find part of the answer to the low productivity of the Small Farmer in the young age of his trees. The drop in productivity between the Big Farmer's trees and those of the Above Average Farmer (1.41 vs 1.51) might be explained by the old age of the former's trees. But how to account for low productivity in Average Farmer 2, when most of his trees are in full maturity? Other factors are involved, but a comparison between age of trees and degree of productivity suggests that a correlation exists.

Soil conditions and micro-climate

We asked the farmers questions concerning the quality of soil in their lime-farms. All but one said that compared to other farms the soil was neither bad nor good; only one farmer, Average Farmer 2, complained bitterly about the quality of the soil in his lime-farm. This factor may therefore influence the difference in productivity.

We do not think that the micro-climate is a factor in explaining differences in productivity. The farms were all grouped in a small enough area to preclude differences in micro-climatic conditions, neither could the topography of the lime farms influence them.

Evaluation

As we have seen, all factors but one may throw some light on the level of productivity among the farmers in our sample. Not one of them seems to be decisive. We have tried, therefore, to weigh them (with the exception of soil and micro-climate) and have listed the scores in table 4[1].

The comparison of productive factors with level of productivity produced the following distribution:

Productive Factors

No. of farmers that scored:

Productivity (No. of farmers that scored:)	High	Low	
High	3	-	3
Low	-	2	2
	3	2	5

Three of the farmers in our study with high productivity--the Big, the Above Average and Average 1 farmers--(see table 3) were also high in the total score of productive factors (see table 4). This shows a strong correlation, the distribution giving a positive phi-coefficient of +1.0. We cannot say whether this is significant, the sample being too small, but we would like to stress again that we think that these

factors are playing a role and that taken together the data make this conclusion acceptable.

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1 Criteria used by weighing performance of each of the farmers in our study with regard to factors influencing level of productivity in lime production: *ratio female/male labour*: all farmers agree that male labourers are able to do more work in a day than female labourers and they also agree that, although male labourers are more expensive than female labourers, this higher capital input is considered to be more rewarding in terms of a relatively higher output. Farmers, therefore, with a low ratio female/male labour are given higher scores than farmers with a high ratio; *ratio weeding/collecting and carrying:* the management-decision to weed only in order to facilitate an efficient collecting of the lime-fruit is considered to be a more rational decision than the decision to weed also in order to increase the yield. Farmers, therefore with a low ratio are given a higher score than farmers with a high ratio; *ratio labour hours/number of trees*: using the assumption that labour increases relatively per number of trees, farmers with a low ratio are considered to work more efficient than farmers with a high ratio. Farmers, therefore, with a low ratio are given a higher score than farmers with a high ratio; *spacing of trees*: trees planted at a distance from each other of 12 feet have a higher yield per year than trees planted at a distance of 10 feet or less. Farmers, therefore, are given a higher score if their trees are planted at the most yielding distance; *age of trees*: farmers with trees in full maturity are given a higher score than farmers with young or old trees.

C O N C L U S I O N

As made clear at the outset this paper is the first attempt to analyse the data collected during a twelve months' study of farmers' activities. After a general analysis of the time budget, in which we discussed how much time the farmers spent on productive and domestic activities and their social obligations, we singled out the most important productive activity--lime cultivation--to find out whether we could get more insight into the question on how the farmer spent his time in that particular activity. In this chapter we will try to formulate a tentative answer to the questions raised in the Introduction.

First, we will deal with the problem of availability of more time for labour and the farmers' reaction to this problem. On the average, lime farmers are making an eight hours' working-day for 20 days a month. We could not take into consideration the fluctuation of labour input throughout the year. It will not be wrong, however, to assume that there are months in which the farmers spend more and months in which the farmers spend less than the average hours mentioned before. Although a study of the agricultural calendar and the related labour input will tell us more, we may already judge from what we know that an increase of labour input which will lead to an increase in production will hardly be possible. But this is not all we can conclude from this preliminary analysis concerning the availability of labour.

We assumed that if more time would have been available this would have been devoted to a higher labour input in lime cultivation. We might have been biased in this respect. It is difficult to compare total time spent on productive activities with total labour input in lime cultivation, because the former concerns time of each farmer individually and because in the latter family and hired labour have also been included. Yet, we may say, that time spent on lime cultivation is only a small part of all time spent on productive activities. We may even say that this minor role of lime cultivation in terms of labour input also

exists if compared with total labour input in all farming activities, although, admittedly, it is still most important of all these farming activities in terms of income derived from it. Farmers spent considerable part of their time on other farming and non-farming activities. As we have seen there is a process of commercialisation of foodcrops and in order to satisfy their wish for further diversification of economic activities farmers find also outlets in activities which are not or indirectly related to farming. The reason for their wish to diversify their economic activities is that the farmers are aware of the dangers of monoculture and that they especially know that the demand for their lime fruit is limited. This means that to a certain extent our question is wrong and that the problem is not whether more labour is available, but that more labour for a particular crop is not available, and attention is paid to other crops or other economic activities. Given the situation that lime cultivation is still the biggest cash earner we may assume that if farmers think it worthwhile, they will devote more and more time to this cultivation. We see, however, that there is a tendency to diversify their economic activities. In other words, it might be possible that farmers in the lime area do not spend more time on lime cultivation because of lowering labour productivity below a level acceptable to the farmers, given the prevailing conditions in their environment.

A further observation concerning availability of time for labour which can be made is that although in general there is no time available for more labour input in individual cases more time could be devoted to labour. We have seen that e.g. Average Farmer 2 gained extra time because he used a bicycle and the Small Farmer had more time available than other farmers because he spent less time on social obligations. It became also clear that the wives of smaller farmers could use more of their time on economic activities.

Another interesting feature of this matter of availability of time for labour is that in individual cases time

could be used in a more efficient way. In the case of productivity of lime production it is clear that the Average Farmer 2 and the Small Farmer make a number of decisions which are different from those made by the bigger farmers and which influence their productivity unfavourably, although we must not forget that other factors beyond their control influenced this productivity as well. One wonders what could be done to increase the production and productivity. An important factor which will influence the solution to this problem is the fact that the processing industry seems to have reached its maximum required output. A mere increase of lime production will therefore not offer a way out.

In order to be able to answer this question the main characteristic of the agricultural calendar has to be taken into consideration. It has been stated that a detailed calendar cannot be discussed at the moment, but what could be observed already is that there are two peak periods in labour input: a minor period and a major period. The peak periods are related to the climatic regime in the area. The minor peak coincides with the end of the long dry season when the farmers have to prepare the farms and plant the new crop just before the first rains are coming and the midcrop of the lime fruit has to be harvested. The major peak period coincides with the short dry season when the farmers have to weed their foodcrop farms and lime orchards and the major crop of the lime fruit has to be harvested. The difference between the two periods in terms of labour input is that the major period shows a higher stress on the labour market than the minor period. This general division of labour input over a period of 12 months leaves therefore maybe only room for a higher labour input during the months in between the peak periods.

One way in which increase of production during these periods could be reached is by devoting more labour to non-farming activities like palmwine tapping and production of charcoal. Opportunities for this kind of activities are restricted by the availability of raw material, the limited

market demand and the limited transport facilities. Another way might be the further commercialisation of foodcrops, like maize and cassava, by processing them into kenkey and garri respectively (homemaking industry). The supply of raw material, cassava and maize, is to a certain extent dependent upon the production capacity of the farmers during the peak periods, whereas the development of this kind of homemaking industry is also limited by the market the farmers themselves are able to reach and the limited transport possibilities. And a third way could be the cultivation of other crops than the present ones like cocoa, yams, sugar cane, tobacco, oranges and ginger. A market for these products exists, but the opportunities for realisation are limited because of the existing shortage of labour during the planting and harvesting seasons and the inadequate storage facilities. The farmers, however, are certainly aware of these possibilities and as we have seen spent a considerable amount of time on non-farming activities and the processing of cassava and maize.

The most important bottleneck for an increase of production seems to be the demand for and the availability of labour during the peak periods. What should be changed? Are there ways to use labour more efficiently by improving the techniques used or by changing the organisation of labour without an increase of capital investment? This latter condition has to be added because the farmers are of the opinion that further capital investment would lead to diminishing returns (which might be true). The discussion of this question is restricted to the production of lime only, because data from the analysis of other crops are not yet available.

Labour in the peak periods as far as lime is concerned is mainly used for weeding, collecting/carrying and marketing. For the collecting and carrying of the lime fruit a simple improvement in technique could bring about a more efficient use of labour. At the moment most farmers are picking the fallen fruit one by one by hand. Some farmers, however, rake the fruit together with the help of an iron scraper.

This simple tool, which can be made by the farmer himself or acquired from a blacksmith at a very low price, was developed a few years ago by some farmers. Considering the spread of the use of the scraper over the area, farmers seem to have concluded that a wider use of it would certainly be an improvement. The collecting of the fruit could also be made more efficient by putting the fruit immediately in bags in stead of throwing the fruit first on a heap outside the lime farm. A number of farmers are doing this already depending on whether the distance between trees allows them to move easily in the orchard.

One could also wonder whether the use of a kind of stretcher made of local material on which a number of bags could be placed to carry the fruit to the roadside or to the collecting station would not be more efficient. This would especially mean an improvement for farmers whose lime orchards are located further away from the roadside or the collecting stations (one to three miles). At the moment small quantities of lime fruit are put in a bag or basket and brought to the roadside or the collecting station and there put in the big bag containing about 3.5 boxes of fruit. These quantities carried are in proportion to the carrying capacities of the labourers (man, woman or child), and the further away the orchard is from the roadside the smaller the quantities carried. Again, this simple implement could be made by the farmer himself or acquired at low cost from a carpenter.

A change in the organisation of labour could reduce the stress on labour further. There exists a form of cooperation among farmers in the Lime Farmers Area, which consists of groups of farmers who help one another on their farms. For example, there are groups of tobacco farmers (4-10 persons) who help one another alternatively with all farming activities related to tobacco and groups of cocoa farmers who assist each other in the harvesting of the cocoa. This particular form of cooperation can also be observed among lime farmers. In the latter case it concerns only a cooperation in weeding. The same form of cooperation if applied

in the case of collecting and carrying would certainly ease the tension on the labour market. Considering, however, the present system of transporting the fruit to the factory, whereby a group of villages is scheduled for a particular day of the week (for Old Ebu the truck conveys the fruit on Mondays), the introduction of this form of cooperation in collecting and carrying is not possible. The reason is that all farmers in a community have to collect the fruit on the same day or days (for Old Ebu on Saturday and Sunday) and to carry it to the roadside. They cannot make use of each other's help on these days and have to rely on family and wage labour. The same situation occurs in the other villages of the Lime Farmers Area.

By mentioning the transport system and schedule of the lime fruit one touches on a major determining factor in the growth of the lime industry, namely the power of the foreign lime processing industry in Asebu. Although there exists another market for lime fruit in Ghana, this demand is so limited that the market in Asebu shows all the characteristics of a monopolistic buyer of an export crop. This buyer determines the quantity and quality of fruit to be purchased, it determines the price to be paid and it determines the ways and means by which it is able to safeguard its maximum required production. As shown in the Introduction the existence of the processing industry was instrumental in the growth of agricultural production. It carries, however, also factors which are limiting the possibilities for the development of a modern agriculture. The present analysis cannot be exhaustive, as said before, but by giving a few examples we may be able to clarify this point and formulate a tentative answer to the question whether factors in the socio-economic and institutional framework have to change before any changes in production and productivity can take place. The examples are related to the transport system and the requirements for the quality of the fruit.

The present transport system whereby the fruit is conveyed from the producing areas to the processing factory is in the hands of this industry. From the point of view of

the monopolistic buyer who wants to protect the supply of raw material this is maybe understandable. At the same time it denies society to develop its own organisational abilities. It imposes a system upon the farmers, which causes a stress on the labour market and limitations in the use of labour for other activities (as discussed before). What would happen if the processing industry would abolish this transport system and if an alternative system could be developed in such a way that it would offer the farmers options in supplying their product, under the condition that the risk of an interruption of an adequate supply of raw material to the factory would be avoided. Assuming that this could be done, the effect of this new system could be that the farmers would organise themselves in cooperative groups with the purpose of helping one another in collecting and carrying the fruit as has been done in other cases.

It has been mentioned in the Introduction that the processing industry does not have any requirements with regard to the quality of the fruit. Without going into any technical details there is, however, a need for better quality of lime fruit than supplied at the moment. Because the industry does not express this need for higher quality the farmers do not pay any attention to the qualitative aspects of their lime fruit (with the exception of grafting in order to avoid the die-back disease). What would happen if the processing industry would demand a high quality lime fruit offering a price which would make the higher investment needed by the farmers worthwhile? In the past farmers have shown a willingness to invest in agriculture and to adopt new techniques where and when economically feasible. There is no doubt that many farmers would venture to grow this higher quality lime fruit.

For a comprehensive development of the rural society these changes of policy will not be sufficient. It could mean a beginning, which could lead to an increase of agricultural production creating capital which could be reinvested in agriculture. It is evident, however, that under the prevailing conditions the farmers are lacking the

opportunities for initiating activities which could lead to a higher level of development, at least as far as the lime production is concerned. Factors which are beyond the control of the farmers are influencing this level of development.

In our discussion we have singled out two examples of economic factors to show the relationship between the environmental conditions and the level of development. It will be clear that other economic as well as social and institutional factors are also playing a role. For a comprehensive analysis of this relationship not only data on the lime production, but also data on other crops produced by the farmers have to be included. We will, therefore, have to analyse our data further before we can attempt to reach sufficient insight into this problem.

A P P E N D I X

I - DETAILED OBSERVATION OF ACTIVITIES

II - DETAILS OF FARMING ACTIVITIES

III - DETAILS OF MARKET ACTIVITIES

IV - KEY FOR TIME BUDGET

TABLE 1 - TIME BUDGET OF MALE FARMERS

TABLE 2 - TIME BUDGET OF FEMALE FARMERS

TABLE 3 - LABOUR HOURS IN LIME FARMING DIVIDED BY SEX AND DIFFERENT ACTIVITIES, PRODUCTION AND PRODUCTIVITY

TABLE 4 - SCORES OF FACTORS INFLUENCING LEVEL OF PRODUCTIVITY

I - DETAILED OBSERVATION OF ACTIVITIES

DATE:	RESPONDENT:	OBSERVER:

Time indications as used by majority of farmers (+ translation)	TIME
Esuom (Deep Darkness)	12.00
Akoko-kan (First cock-crow)	1.00
	2.00
	3.00
	4.00
Otsia-ebaasa or Enyim-aye-wona nyew-awo (Third cock-crow or inability to recognize other faces)	4.30
	5.00
	5.30
	6.00
Anapa (Morning)	6.30
Akoffo-reko-haban-mu or Adze-Akye (farm-going period or day is on)	7.00
	7.30
	8.00
	8.30
Wim-awo (Sky is dry)	9.00
	9.30
	10.00
Oka kakra ma wi-egyina (Sun about to be still)	10.30
	11.00
	11.30
Wi-egyina (Sun-still)	12.00
	12.30
Wi-redan (Sun turning)	1.00
	1.30
Wi-adan (Sun has turned)	2.00
	2.30
Pon-aber-aso (Closing time)	3.00
	3.30
Abe-twa-ber (Palm-wine tapping period)	4.00
	4.30
Wireko/Osomfo-wia/or wi-atsen (Sun about to set)	5.00
	5.30
Wi-ato (Sun-set)	6.00
De dafo (Sleeping agent)	7.00
	8.00
Adze-asa (Day is over)	9.00
	10.00
Kurom-ater-dzinn (Night is advanced, town is dead silent)	11.00
	12.00

II - DETAILS OF FARMING ACTIVITIES

DATE:	RESPONDENT:	INTERVIEWER:

1. Haban a ekeyee edwuma wo mu no, wo henfa?	1
2. Haban no woana dze a?	2
3. Ereko haban mu no ennhyia obiara, anaa de biribiara annsee wo mber, wo kwan mu a?	3
4. Se otse dem a: (a) Ebenadze na osee wo nber anaaso de woana na ihyiaa no? (b) nber ahen n idzii no wo ho?	4(a) 4(b)
5. Woananom na enye hom yee edwuma wo haban mu nde?	5
6. Eben dwuma na idzii wo haban mu?	6
7. Dwuma a idzii no, ne kese anaaso no dodow tse den? (Bo mbodzen de ibohu dwuma dodow a odzii anaaso nduadzewa dodow a odzi baa fie)	7
8. Se okuafo no dze nduadzewa bi baa fie a: (a) No mu ahen na odzi no wo fie? (b) Nkaano woye no den?	8(a) 8(b)
9. Eben aber na egyee w'ahom? (Bo mbodzen de ibohu mber nketse-nketse a odze gyee n'ahom anapa na ewiaber)	9
Se nnye okuafo noara nko koor haban mu a: 10. Hon a enye hom yee edwuma no, enye hon nyinara baa fie per a, anaade binom baa fie gyaa binom?	10
Se binom dzii kan baa fie a: 11. (a) Woananom dzii kan baa fie? (b) Eben aber na wosii mu?	11(a) 11(b)
12. Ereba fie no ennhyia obiara, anaa de biribiara annsee wo mber wo kwan mu a?	12
13. Se onntse dem a: (a) Ebenadze na osee wo mber anaa de woana na ihyiaa no? (b) Mber ahan na idzii no wo ho?	13(a) 13(b)

III - DETAILS OF MARKET ACTIVITIES

DATE:	RESPONDENT:	INTERVIEWER:

1. Gua no a ekoree mu no wo henfa?	1
2. Isii den koree?	2
3. Eroko gua no ennye obiara ennhyia anaa so biribiara annsee wo mber?	3
Se otse dem a: 4. (a) Ebenadze na eyee wo ber a eroko gua no? (b) Mber ahen na idzii wo ho?	4
5. Eben nduadzewa na edze koor ho?	5
6. Ana obi boaa wo ma edzenduadzewa ne koor gua do a?	6
7. Ana nduadzewa no fi woara wo kwâ mu a?	7
8. Ana itumii toon nduadzewa no nyinara a?	8
Se onntse dem a, 9. Nna no my ahen na okae?	9
10. Ana etoo ndzemba bi wo gua mu a?	10
Se otse dem a, 11. (a) Ebenadze na etoe? (b) Edze baa Ebu Dadaw mu a? (c) Ndzemba no ebeye no den?	11
12. Ana obi boaa wo ma edze ndzemba no baa fie a?	12
13. Ereba no biribiara annsee wo mber, anaaso de ennhyia obiara wo kwan mu a?	13
14. Se otse dem a, a. Nna ebenadze na eyee? b. Mber ahen na idzii no wo ho?	14

Translation : Details of Farming Activities

1. Where is the farm you worked located?
2. Who is the owner of that farm?
3. When going to the farm, did you meet any person or did something happen costing your time?
4. If yes: a) What happened and whom did you meet? b) How much time did you spend there?
5. With whom did you work in the farm today?
6. What did you do in the farm?
7. How much did you do? (Try to find out how much the farmer did or quantity of produce harvested).
8. If the farmer harvested any produce: a) What part of it is for home consumption? b) What is done with the remainder?
9. When and for how long did you rest? (Try to find out the short rest periods in the morning and afternoon).
10. If the farmer did not go to the farm alone: did the others with whom you worked today come home with you or did some of them come earlier home?
11. If some of others came home earlier: a) Who came home earlier? b) At what time did they stop working?
12. When coming home, did you meet any person or did something happen wasting your time?
13. If yes: a) What happened or who did you meet? b) How much time did you spend there?

Translation: Details of Market Activities

1. To which market did you go?
2. How did you go there?
3. When going to the market did you meet any person or did something happen wasting your time?
4. If yes: a) What happened to you? b) How much time did you spend there?
5. What kind of produce did you take to the market?
6. Did someone help you to take the produce to the market?
7. Did you produce the products on your own farm?
8. Were you able to sell all your produce?
9. If not: How many or much of it was left over?
10. Did you buy anything in the market?
11. If yes: a) What did you buy? b) Did you bring it to Old Ebu? c) What do you use goods for?
12. Did someone help you to bring those goods home?
13. When coming home, did you meet any person or did something happen wasting your time?
14. If yes: a) What happened to you? b) How much time did you spend there?

IV - KEY FOR TIME BUDGET

1. FARMING ACTIVITIES

Clearing of bush
Making bed for Tiger- & Ground-nuts
Uprooting cassava
Collecting Lime fruits
Fencing a farm
Sharpening of cutlass
Harvesting in general
Crafting, Buying of lime
Storing

2. PREPARATION FOR FARM

Sharpening of cutlass at home
Buying food for farm
Dressing for farming
Assembling things needed in the farm
Collecting labourers and paying
Washing bags

3. NON-FARMING

Hunting (Traps installation checking,etc.)
Charcoal burning
Bar (selling of akpeteshi)
Building of houses
Communal labour
Palm wine tapping
Cutting firewood

4. PREPARATION FOR NON-FARMING

Assembling of things needed for this activity
Repair of traps

5. MARKETING

Selling lime
Selling cassava
Selling Kenkey
etc.

6. PREPARATION FOR MARKET

Collecting or assembling things needed for market
Waiting time for lorry

7. HOUSEHOLD

Preparation of food
Taking of meals
Toilet
Bath
Feeding children and self
Cleaning of house
Fetching water

8. LEISURE

Visit to a friend
Travelling
Visit to a patient

9. REST

Resting or sleeping on the farm during breaks or direct after work at home

10. TRADITIONAL

Waiting for and meeting with any kind of chief
Funerals
Asafo company meetings

11. NON-TRADITIONAL

Church

Note: For non-productive activities, the time for preparation and travelling are all included.

Table 1.
TIME BUDGET OF MALE FARMERS

CATEGORY OF FARMER	PRODUCTIVE ACTIVITIES							DOMESTIC ACTIVITIES						SOCIAL OBLIGATIONS			TOTAL
	Farming	W/P[1]	Non-Farming	W/P[1]	Market	W/P[1]	Sub-Total	Sleep	House-hold	Leisure	Rest	Med.	Sub-Total	Trad.	Non-Trad.	Sub-Total	
BIG	87.27[2]	36.83	37.45	12.96	7.60	2.39	184.50	276.77	72.37	55.13	47.73	9.71	461.71	52.28	21.10	73.38	719.59
ABOVE AVERAGE	72.01	37.14	31.40	1.52	11.75	4.22	158.04	268.19	59.65	106.69	67.66	0.19	502.38	59.80	-	59.80	720.22
AVERAGE No. 1	95.15	32.67	13.40	5.66	3.53	2.05	152.46	256.17	54.46	107.13	67.39	1.02	486.17	80.92	0.34	81.26	719.89
AVERAGE No. 2	69.38	16.22	39.23	4.69	7.40	3.07	139.99	256.99	69.17	116.65	52.35	11.09	506.25	53.47	20.23	73.70	719.94
SMALL	89.66	32.43	31.67	4.43	3.30	1.39	162.88	255.46	65.32	130.30	61.22	8.11	520.41	33.49	3.19	36.68	719.97
AVERAGE[2]	82.69	31.06	30.63	5.85	6.72	2.62	159.57	262.71	64.19	103.18	59.27	6.02	495.38	55.99	8.97	64.96	719.92

1) W/P refers to walking to place of activity and back home of the individual farmer and to preparation for that activity.

2) Figures refer to hours.

3) Average hours per month (month 720 hours).

Table 2

THE BUDGET OF FEMALE FARMERS

CATEGORY OF FARMER: WIFE OF	PRODUCTIVE ACTIVITIES							DOMESTIC ACTIVITIES						SOCIAL OBLIGATIONS			
	Farming	W/P[1)]	Farming	W/P[1)]	Market	W/P[1)]	Sub-Total	Sleep	House-hold	Leisure	Rest	Med.	Sub-Total	Trad.	Non-Trad.	Sub-Total	TOTAL
BIG	64.60[2)]	32.82	32.18	5.62	21.95	9.94	167.11	275.51	157.16	25.90	40.16	4.48	503.21	45.72	3.92	49.64	719.96
ABOVE AVERAGE[1]	89.42	58.10	-	-	-	-	147.52	270.15	172.15	47.66	34.27	5.04	529.27	25.20	17.93	43.13	719.92
2	75.67	53.40	2.68	0.37	7.69	2.35	142.16	259.74	148.95	58.78	41.36	0.82	509.65	53.44	14.65	68.09	719.90
AVERAGE No.1[1]	45.72	19.90	66.44	3.73	43.96	7.82	186.97	250.16	136.40	76.40	45.27	6.27	514.50	17.35	1.24	18.59	720.06
2	82.16	33.77	15.62	1.08	12.17	6.91	151.71	251.92	182.66	36.63	40.03	2.16	513.40	20.66	33.84	54.50	719.61
3	77.73	32.22	12.96	1.13	10.68	3.80	138.52	259.28	148.00	60.56	42.40	6.89	517.13	25.34	39.02	64.36	720.01
AVERAGE No.2[1]	67.93	22.13	13.88	1.18	6.67	2.74	114.53	271.25	213.50	29.18	39.66	6.49	560.08	34.83	10.44	45.27	719.88
2	61.34	20.81	18.22	2.38	7.20	2.74	112.69	276.77	189.09	45.43	33.70	9.36	554.35	42.91	10.09	53.00	720.04
SMALL	60.37	28.92	12.34	0.95	8.22	3.91	114.71	283.90	195.43	53.29	47.47	11.12	591.21	12.52	1.58	14.10	720.02
AVERAGE[2)]	69.44	33.50	19.35	1.83	13.17	4.47	141.76	266.52	171.48	48.20	40.48	5.85	532.53	30.89	14.75	45.64	719.93

1) W/P refers to walking to place of activity and back home of the individual farmer and to preparation for that activity.

2) Figures refer to hours.

3) Average hours per month (month 720 hours).

Table 3

LABOUR HOURS IN LIME FARMING BY SEX AND DIFFERENT ACTIVITIES, PRODUCTION AND PRODUCTIVITY

CATEGORY OF FARMER	M A L E		F E M A L E		C H I L D R E N		SUB-TOTALS		TOTALS	TOTAL PRODUC-TION (IN BOXES)	PRODUC-TION/ MAN-HOUR (IN (BOXES)
	Collecting and Carrying	Weeding	Collecting and Carrying	Weeding	Collecting and Carrying	Weeding	Collecting and Carrying	Weeding	All Activi-ties		
BIG	398.50	74.00	146.50	--	223.00	--	768.00	74.00	842.00	1190.00	1.41
ABOVE AVERAGE	247.00	132.50	145.75	--	26.00	6.00	418.75	138.50	557.25	841.75	1.51
AVERAGE 1	82.25	34.00	124.25	--	9.25	--	215.75	34.00	249.75	322.88	1.30
AVERAGE 2	123.50	253.25	318.25	--	--	--	441.75	253.25	695.00	584.50	0.86
SMALL	87.25	40.00	62.00	--	--	--	149.25	40.00	189.25	133.00	0.68
AVERAGE	187.70	106.75	159.33	--	51.65	1.20	396.70	107.95	506.65	614.43	1.21

1) The actual number of hours put in by children is twice as much as appears in this table. We assume that 1 labour hour of a child equals 0.5 labour of an adult.

Table 4

SCORES OF FACTORS INFLUENCING LEVEL OF PRODUCTIVITY

CATEGORY OF FARMERS	RATIO FEMALE/ MALE LABOUR		RATIO WEEDING/ COLLECTING/ CARRYING		RATIO LABOUR-HOURS/NOS OF TREES		SPACING OF TREES		AGE OF TREES		TOTAL SCORE
	Range	Score	Range	Score	Range	Score	Range	Score	Range	Score	
BIG	0.31	2 2	0.10	3	0.84	2	12-15'	3	13 yrs.	2	12
ABOVE AVERAGE	0.39	2	0.33	2	0.69	3	8-12'	2	10 yrs	3	12
AVERAGE 1	1.01	1	0.15	3	0.50	4	10 ft	2	10 yrs	3	13
AVERAGE 2	0.84	1	0.57	1	1.29	1	10 ft	2	10 yrs	3	8
SMALL	0.49	2	0.27	2	0.63	3	8 ft	1	5 yrs	1	9