SOIL PRODUCTIVITY RESEARCH PROGRAMME

IN

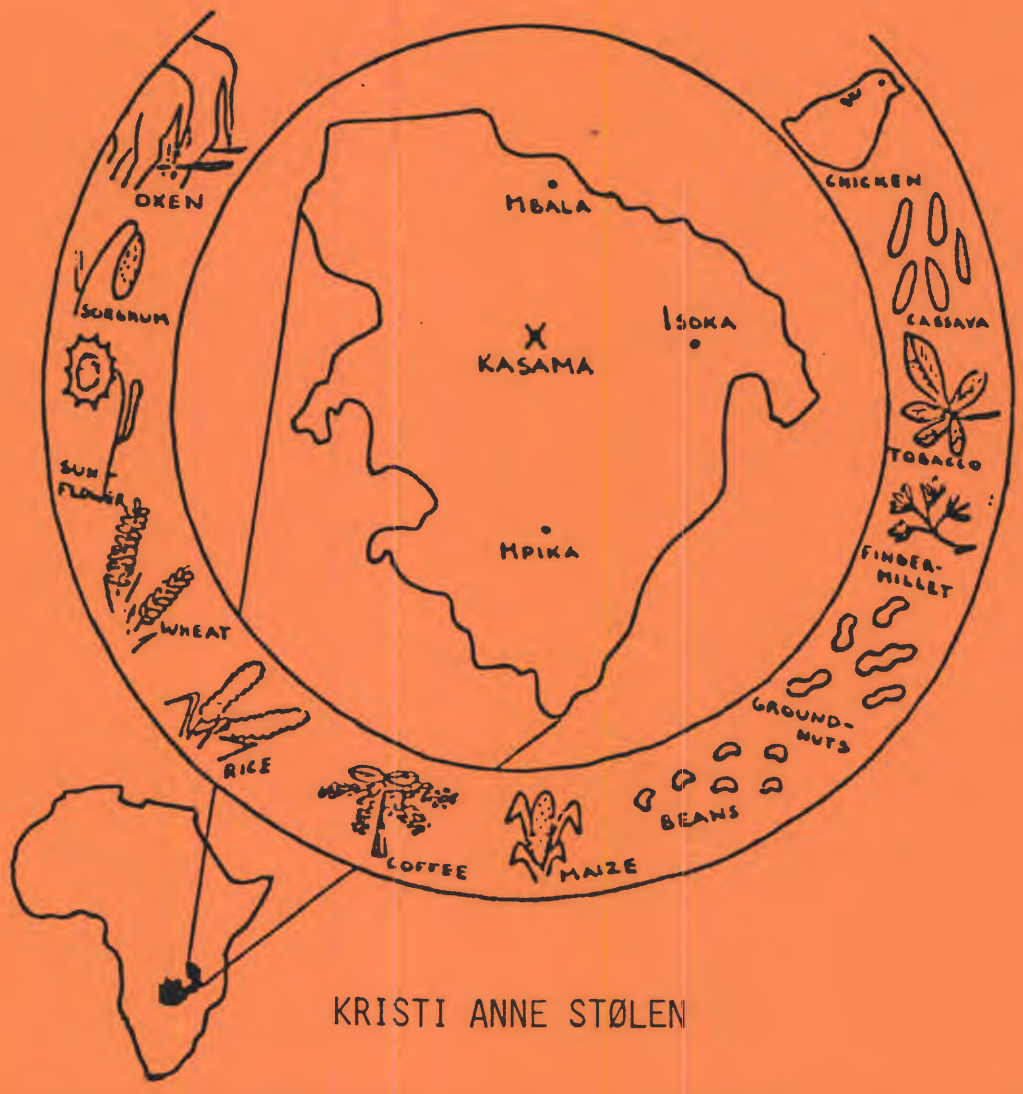
THE HIGH RAINFALL AREAS IN ZAMBIA

REPORT ON PHASE I

1981-1983

PART 3

PEASANTS AND AGRICULTURAL CHANGE IN NORTHERN ZAMBIA



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Soil Productivity Research Programme

in

The High Rainfall Areas in Zambia

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Peasants and Agricultural Change in Northern Zambia

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PUBLISHER'S PREFACE

The Soil Productivity Programme (SPRP) in the high rainfall areas of Zambia commenced in April, 1981. The Programme was initiated on the basis of agreement between the Government of Zambia (GRZ), the Norwegian Agency for International Development (NORAD) and the Agricultural University of Norway (AUN).

The work is centered at Misamfu Regional Research Station, Kasama, and covers the Northern Luapula, Copperbelt and North-Western Provinces in Zambia, approx. 370 000 km^2. Most of the work has been carried out in Northern Province.

The overall aim of the SPRP is to enable Zambian authorities to establish a long term soil productivity research programme which will produce more permanent farming systems in the high rainfall areas for farmers at different levels of technology.

The major target is the smallholders in the designated area.

For the initial period of the project (phase I) which ended June 30th 1983, AUN has provided senior scientific personell totalling 59 man months plus 21 man months representing graduate students. Staff assigned to SPRP by GRZ has amounted to 2 junior technical officers. The project is expected to continue at an expanded scale.

The emphasis of the investigations in phase I has been to provide better understanding of soil conditions, crop production and farm management systems and their interactions. Information sources have been Department of Agriculture; Research, Land Use and Extension branches, Parastatal agencies, local farmers and relevant literature. In addition, the SPRP's soils, agronomy and agricultural economy sections have carried out field investigations in different parts of the high rainfall areas.

Reports and papers of general interest emerging from this project will be presented in this series.

We gratefully aknowledge the cooperation of the GRZ, especially the Research Branch of the Department of Agriculture. We also thank NORAD for its financial support of the SPRP project of which this publication is a part, and the NORAD representation in Zambia for its logistical support and assistance. Finally, we thank the people of the Northern Province for their cooperation and hope that this joint effort may serve their needs.

Halvor J. Kolshus

Ås, February 1986

PREFACE

This report is to a large extent a collective product. Apart from myself being the project leader for the socio-economic part of SPRP, four other people have been directly involved in the process of field studies and elaboration of collected material, as well as the writing of report and thesis on which this final report is based. E.P. Archetti from the University of Oslo participated in the field study in 1981 and was co-author of the preliminary report based on this study (Archetti & Stølen, 1981). Parts of that report are included in the present report.

T. Vedeld from the Agricultural University of Norway (AUN) also participated as a graduate student assistant in the 1981 field study. His thesis, first presented in 1981, was partly based on material collected during the field work, partly based on secondary material, and has been a useful contribution for the further studies in the socio-economic part of SPRP (Vedeld, 1983).

In 1982 P. Vedeld and R. Øygard, agricultural economics graduate students from AUN, made a second field study in Zambia. The material collected has been elaborated by them and published (Øygard & Vedeld, 1983). Parts of their material have also been used in this report.

In spite of the collective character of the work underlying this report, I take the responsibility for the way the material has been used in the present context.

I would like to thank our interpreters Mr. Kabwe, Mr. Kafwani, Mr. Mutambo, Mr. Mwenya and the Agricultural Assistant in Chitoshi Camp for their help in translating from Bemba and Mambwe to English and vice versa, and for generously to have shared their food and houses, as well as their knowledge and experiences with us.

I would also like to thank the typists Marit Svendsrud and Øyrunn Hankø Wang; Pål Vedeld for his assistance during the writing of this report, and Marit Melhuus for helping to make the English more readable.

Finally, I would like to express our gratitude to all our informants for their patience and cooperation in answering our (at times) strange questions. I hope that I have been able to give a correct picture of what they told us and let us observe.

Kristi Anne Stølen

AUN-AS, April 1983

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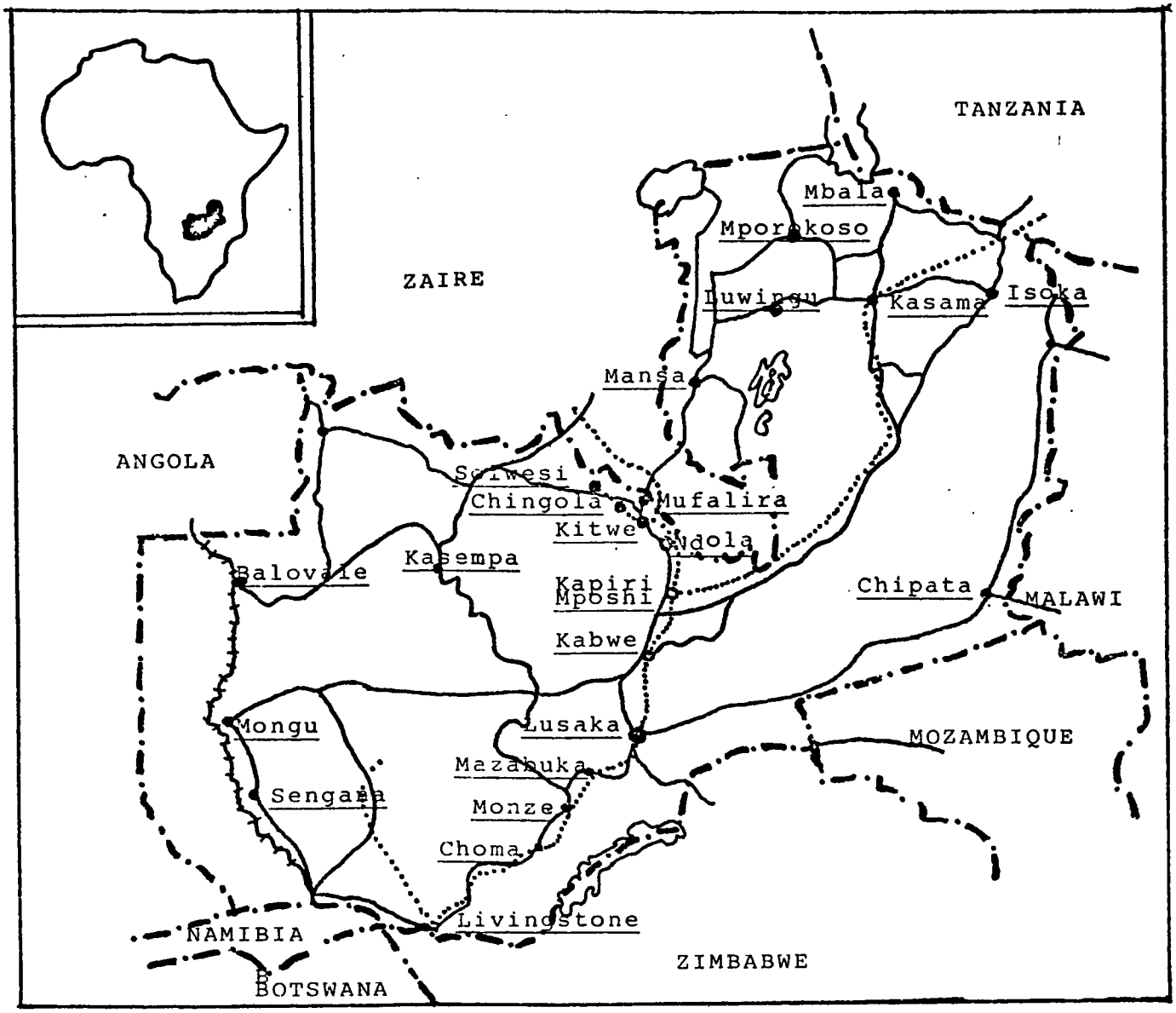
MAP 1. ZAMBIA



——— road
..... railway line
—·— national frontier
+++++ river
• ●● town

I. INTRODUCTION

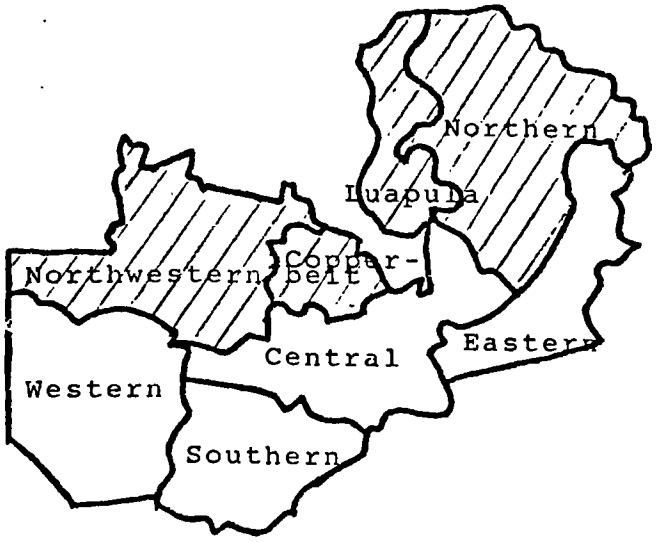
Background and objectives

The present work is based on a socio-economic study undertaken within the frames of Phase I of the "Soil Productivity Research Programme in High Rainfall Areas in Zambia" (SPRP). The project is a co-operation between the Agricultural University of Norway and The Ministry of Agriculture of Zambia. Phase I started in April 1981 and will end in July 1983. The programme comprises the following fields of research: Soil science, agronomy and socio-economy.

According to the Agreement between Zambia and Norway: "The overall aim of the project is to enable Zambian authorities to establish a long term soil productivity research programme which will produce more permanent farming systems in the high rainfall areas for farmers at different levels of technology". Concerning the socio-economic field, the Agreement states: "The Project will also include an evaluation of the capacity of the small peasant households to modify their existing productive strategies when confronted with new farming techniques and their capacity to adapt to changes favouring the growth of production and the expansion of the surplus oriented towards the urban market".

According to the Agreement, the SPRP should cover the high rainfall areas in Zambia, which include the Northern, the Luapula, the Copperbelt and the Northwestern Provinces (See Map 2, page 3).

MAP 2. THE PROVINCES OF ZAMBIA.



The high rainfall area.

However, due to the limited resources given to the socio-economic research during Phase I (two anthropologists/ four and two months respectively, and three students/ three months) it was decided to concentrate the research efforts in this field to the Northern Province only.

Chitemene (slash and burn cultivation) can be said to dominate the agricultural picture in the Northern province[1].

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1) The field is called chitemene (pl: fitemene) during the first year i.e. when it is slashed and burnt. The following years it is called fifwani (pl: fifwani).

However, this picture is more diversified now than it was only a few decades ago. Regional differences can be found between the tribal areas, e.g. among the Mambwe chitemene cultivation has almost disappeared. Semipermanent/permanent hoe or plough cultivation by use of green manuring or cattle manuring is now the most common. Even in the heart of the Bemba area variations with regard to the relative importance of chitemene compared to permanent cropping is found. Firstly, intervillage differences can be observed. Some villages are more involved in permanent cropping and are more market integrated than others. Secondly, we find such differences between households in the same village. In order to make an evaluation of the capacity of small peasant households to modify their existing productive strategies, it is necessary to examine how the mentioned differences are produced.

II. MODEL OF ANALYSIS

Actor-oriented and comparative approach to the study of production systems

In a peasant economy like that of the Northern Province, households are the units of production. It is at this level decisions regarding production are taken. The present study puts special emphasis on the way agricultural producers allocate resources in the production process. In general terms, the result of a given combination of resources is called a production system. Obviously, any production system is a

result of the combination of different types of resources, some of them related to ecology and agro-climatic conditions, as the type of soil, water and temperature, others to specific techniques and technology in use, and also to social, cultural and economic conditions. Therefore, a production system is the totality of the allocation of these different resources.

The objective availability of resources, as well as the actual use of them, and the subjective perception of the producers themselves for their particular use, define the constraints operating in the reproduction of the system. In this way, the overall productivity of any system reflects the interplay of these different constraints.

The socio-economic factors influencing decision-making processes at the household level, are of different order. On the first hand, they are related to internal characteristics of the household unit, such as the size and composition of the unit, which determine its consumption needs and its production capacity. On the other hand, due to the existence of a market economy, the decision-making at the household level is also influenced by factors external to the household and the village, such as prices of agricultural products and inputs, the functioning of marketing agencies and rural extension services, the urban labour market seen as an alternative source of income, to mention only a few of them. There is no absolute distinction between the domestic or internal sphere and the public or external one. A certain intersection exists. For example,

the household labour force is not only an internal resource, it can also be employed as a resource in the external labour market. On the other hand, the household can hire additional labour force, which is then converted to a resource in the allocation process of the household. Similarly, both livestock and capital may represent external and internal resources at the same time. All these factors representing "micro" as well as "macro" levels are directly or indirectly operating as opportunity structures influencing the decision-making at the household level. Thus, if an actor-oriented model of analysis shall be of any use, it is necessary to combine it with an account of the wider systems at different levels of which the actors form a part. The present study aims at integrating the "micro" and "macro" levels, while focusing on social actors.

There is also a comparative perspective underlying our analysis. As we have mentioned above, differences with regard to production systems are found between households within a particular village and more so between households located in different villages and in different tribal areas. We assume that the intravillage differences are mainly related to differential access to internal resources like (e.g. labour, land and individual capacities) since the external circumstances such as location with regard to marketing and extension services are constant. In order to examine the impact of these "external" circumstances on production systems, we selected villages with different access to transport, markets, credit and extension to be studied comparatively. In order to cover the main pro-

duction systems found in the area, we had to cross tribal boundaries. Thus, it was also necessary to examine the impact of tribal differences on production systems. Such tribal differences relate to social organization, e.g. kinship system, settlement patterns and rules of inheritance.

We consider the actor-oriented and comparative approach underlying as a means to reveal the complexity of factors influencing the decision-making processes among peasants. By isolating these factors or at least some of them and examining how they in turn are related to decision-making processes, we may consider the possibilities of change, once there is some alternation in the factors thus isolated. The different factors or constraints are identified below.

Constraints operating on the production systems

In the following scheme (see page 8) we have identified three fields of constraints including ecological, agro-technical and socio-economic dimensions. Our study is mainly concerned with the socio-economic dimensions, but in order to understand their impact on the production systems it is necessary to take into account ecological as well as agro-technical conditions present in a given context. A thorough study of these fields of constraints is outside the scope of our study and should be taken care of by the other scholars representing the agronomy and soil science part of SPRP.

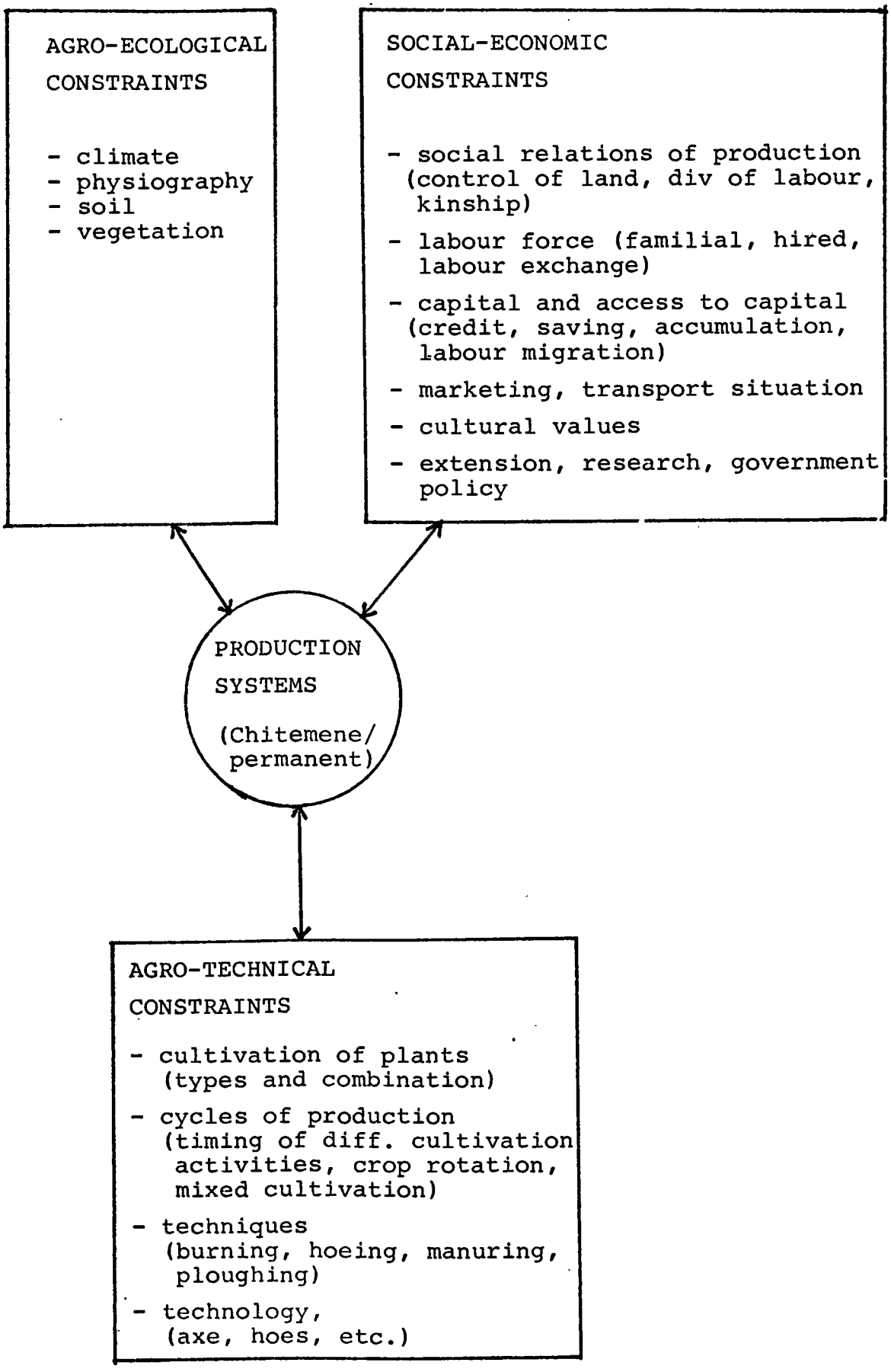


Fig. 2. Constraints operating on the production systems.

Social and economic constraints

We assume that the combination of labour force, livestock and capital with land are crucial elements in the decision-making process of particular producers. So are the market conditions. Before we start the analysis of our empirical data, we will give a short specification of the factors to be analysed.

Land

We will distinguish three different land uses: Chitemene, semi-permanent/permanent cropping and village gardening. Empirically these land uses can be combined differently, for instance some producers combine chitemene with village garden, others chitemene with semipermanent and village garden and so forth.

Labour

The dimensions analysed are the following:

Household composition

Any household has a particular developmental cycle which begins with marriage and ends with death. This implies that a variation over time is expected. The variation represents different combinations of producers and consumers. The availability and possible mobilization of labour force is intimately related with the developmental cycle of each particular household. So are the practices of polygamy, divorce and adoption. Therefore, marriage strategies regulated by custom and the demographic situation of the villages are crucial social contexts that must be identified.

Age of the household members

The age of the household members indicates the capacity to work. Moreover, the age of the head of household also may indicate the possibility of accepting changes in the way production is organized. The age factor can be relevant for conditioning the allocation process in each unit of production, and should therefore be examined.

Sexual labour division

The allocation of tasks is not only related to household composition and age but also to the sexual division of labour. The internal resources of a particular household depends on the ratio of producers to consumers as well as on the sex ratio. The incidence of a rigid and ritualised division of labour on labour productivity must be investigated.

Kinship

The groups of producers studied are both matrilineal and patrilineal. Matrilineality and patrilineality are not only related to descent but also to the process of social organization in terms of residence, cooperation and inheritance. Therefore, kinship also influences labour division and the distribution and circulation of goods and multiple services at the level of the village as well as in society in general. The effect of kinship on local social groups will be an important dimension affecting the production system.

Additional labour force

The utilization of labour force is mainly related to the above mentioned factors. However, the existence of forms of cooperation based on the exchange of labour for beer is a well known process in various peasant societies. We will investigate the incidence of this aspect on the labour process. Another form of using labour force is hiring labourers for payment in money or kind. Recent articles and reports from Zambia are especially concerned with the increasing proletarianization and social differentiation in the countryside. Therefore, we will pay attention to the consolidation and growth of a labour market in the areas of study. Obviously a growth of a labour market can generate possibilities for some producers to expand their production beyond the constraint represented by the familial labour force, by kinship ties, by neighbourhood and by institutionalized forms of labour exchange.

Livestock

The availability of livestock is an important factor in many African societies. This factor plays a determining role in the process of work as well as in terms of productivity in agriculture. A focus for our research has been to study the impact of cattle on different production systems. Moreover, we will examine how livestock is obtained, how it is used, and how it is transferred. We will also analyse the multiple

functions of livestock: As a factor of production, as a saving asset, as a source of prestige, and why not as a potential source of conflict and differentiation in the village.

Capital

Capital can exist as fixed or circulating capital. Fixed capital implies a long-term investment, for instance in means of production or means of transportation. On the other hand circulating capital is a short-term investment in seeds, insecticides, pesticides and fertilizers. We will concentrate our report on the actual use and the existing possibilities for obtaining both fixed and circulating capital. The facilities can be related to credit availability, to the livestock market and the different forms of saving. The availability of capital does not only depend on the rationality of each producer but also on the capacity a society has for generating capital for the maintenance of production. It is a real problem for a given producer to obtain sufficient money, but once this has been solved, the following problem is to find seeds and fertilizers in the amount needed and at the right time.

Market conditions

As a logical and empirical conclusion to the above the external market conditions, regarding both inputs and outputs, is of particular relevance for the units of production and for their reproduction over time. We will analyse the type of marketing, transport facilities, forms of payment, prices and

availability of production inputs as key elements for detecting market conditions. The organization of the market can be decisive in promoting changes at the level of production. We can postulate that it is impossible to imagine changes of productivity and its continuity over time without improving market conditions. The market can be a major bottleneck, hindering social change.

Cultural values

In order to evaluate the possibilities for change in the production system it is important to take into account how the producers themselves establish a hierarchy of values. As the producers in most cases combine subsistence with cash crops it is important to detect which of the two kind of crops are preferred. This can be correlated with the kind of cash crop produced: Is this crop at one and the same time both subsistence and cash crop, or purely a commercial one? This aspect can be related to food preferences as well as to drinking patterns. What they eat and what they drink, and especially at which occasions, is a cultural pattern which may be difficult to change. The same can be said for the use of labour and how it is culturally defined in terms of sexual division, kinship obligations and in relation to leisure and "the good way of life". Livestock is another factor, which should be looked at in a wider cultural context.

Cultural values express the meaning and the reasons of events that can be located in the social economic dimensions. We are

not interested in making a general study of whole cultures, but only wish to mention some cultural categories which are relevant for understanding the logic of production and the conditions of reproduction and change of different productive systems.

III. SURVEY METHODOLOGY

As can be seen from our model of analysis presented above, production system is a key concept guiding our research. We have already mentioned the variations regarding agricultural practices. We find traditional chitemene cultivators, semipermanent hoe cultivators as well as peasants using oxen for ploughing. These differences in agricultural practices are partly separated geographically, partly mixed in the same geographical areas and in many cases even mixed within the production units. At the same time, we find a considerable variation regarding subsistence/cashcropping and level of market integration. This is closely related to the actual production system, including use of technological inputs. Two studies has been realized within the frames of our model of analysis, one in 1981, the other in 1982.

The 1981 study

The selection of survey areas was made in order to cover the main variations in production systems in the Northern Province. Due to "man/time" limitations of the staff, we tried to select heterogeneous areas in the sense that different "types" of

peasants could be found within the same area. This was possible as far as variations regarding chitemene and semi-permanent/ permanent hoe cultivation were concerned. However, it was not possible to find adequate areas for study including chitemene cultivators and peasants using oxen for ploughing. Ox-ploughing is mostly found in combination with permanent hoe cultivation. Therefore, as mentioned above, two areas of study had to be selected in order to cover the dominant production systems: The Bemba tribal area where chitemene and hoe cultivation are predominant and Mambwe, where the use of oxen is quite common. The Bemba is a matrilineal tribe, the Mambwe a patrilineal one. Thus, the impact of tribal differences on the production systems had to be considered.

When the general survey areas had been selected, a pre-survey was first undertaken in different rural areas in Kasama East District, interviewing farmers, extension officers and local politicians. A detailed description of farming as well as information of more general character were obtained, and a preliminary questionnaire was elaborated. The questionnaire covered socio-economic as well as agronomic information (household size and composition, agricultural practices including cropping pattern, use of soil, labour and capital inputs, use of product, food preferences, marketing, cash income, use of additional labour force, labour migration, and saving). The questionnaires were tested by the staff, interviewing farmers in two different villages. Some modifications had to be done before starting the survey.

Mwenesanso village was selected as the first unit of study. As Mwenesanso village appeared to be dominated by chitemene cultivators, we selected 10 farmers from Chisanga village as a kind of control group. They were semipermanent/permanent cultivators with a considerable amount of maize sold to the Northern Cooperative Union (from now NCU). A similar pre-survey was undertaken in Mbala district, and Mulenga and David Chikoti villages were selected as units of study. The questionnaire designed for the Bemba villages was adapted in order to cover the differences found between the two areas. Only the material from Mulenga is included in this report.

The process of interviewing was based on a "whole village approach". This implies taking a whole village cluster out of which as many household units as possible are covered. This approach is more time-saving, as interviewing can be organized through the headman and it is possible to make rapid decisions on who is going to be interviewed next, when faced with unpredictable interferences such as member absence, refusal of a selected householder, etc. Another advantage with this approach, as compared to a probability sample approach, is that it is possible to detect local subsystems, for instance based on kinship, neighbourhood, etc., that can be of crucial importance for the understanding of different farming strategies.

A single interview took about one hour, but since a period of two to three weeks was spent in each of the respective areas,

further data were collected through observation and informal contacts with the informants, and items of special interest were discussed, for instance kinship and marriage, relations between sexes, witchcraft, drinking patterns, religious matters.

The 1982 study

The 1982 study can be considered as a second phase in the research process. This study was undertaken within the frames of the constraint model designed for the socio-economic part of SPRP as a whole. At the same time it focused more specifically on two factors which during the 1981 study were identified as major constraints on changes in agricultural production: labour and markets. The access to and use of labour could be studied by comparing households within a village. In order to study the impact of markets and marketing facilities, however, different villages representing variations regarding availability of means of communication and location in relation to markets and marketing services had to selected. Four villages, representing different cases regarding market integration were selected. Shikashimba and Buyala in Kasama East District and Chitula Mayuni and Chikafya in Mporokoso District. Unfortunately the questionnaires from Chikafya were stolen before being analysed. Therefore, only material from three of the villages studied is included in this report. In order to control the impact of tribal differences, the villages selected in 1982 were all located within the Bemba tribal area.

Except from certain differences in focus which are also reflected in the criterias of selection of areas and villages of study, the process of preparation as well as the process of carrying out the study were similar to those of the 1981 study described above, and will not be repeated here.

Limitations of the studies and the report

The studies were prepared and carried out during a relatively short period of time. This was possible thanks to the availability of second hand material, especially the thorough studies made by Richards and Watson (1939, 1958). These studies give a detailed description and analysis of many aspects of the Bemba and Mambwe societies and have been extremely useful as sources of background information for our research.

Due to the short time available for field work, our research was mainly based on the use of questionnaires, which is far from an ideal way of collecting information in a context where people do not know the interviewers and have problems to understand the purpose of the interviewing, however carefully this is explained. Moreover, most people are illiterate and sceptical to the recording of their answers.

A general problem related to the use of questionnaires is that one have to rely on the informants account of what they do and how they do things, with very limited possibilities to observe or otherwise check how they actually behave.

It is no secret that there might be big discrepancies between the subjective conception of behaviour and actual behaviour, even when the informants are answering honestly. These discrepancies are certainly increased when the informants want to hide information or simply do not remember.

A related problem is that of discrepancies in the "conception of reality" held by the informants and the interviewers. We wanted, for instance, to measure land use and labour input in terms of size of cultivated area and time spent. These are often not relevant categories especially among the Bemba, whose activities are more task oriented than time oriented, to mention only one situation where this problem appeared. They work "until the chitemene is large enough" or "until my power finish", without thinking in terms of days and hours. Such discrepancies pitch high demands upon the ability of the interviewer to "translate" information from one cultural code to another. Own observation and measuring would have been more adequate "tools", in order to get accurate information, e.g. about use of land and labour, and yields. However, this was not possible within the time scope of our studies.

The language problem was an obstacle during the interviewing. Very few informants spoke English, none of the researchers or students spoke Bemba or Mambwe. We had to rely on interpreters. It was therefore difficult to control whether the questions and answers were properly translated or understood by the parts involved.

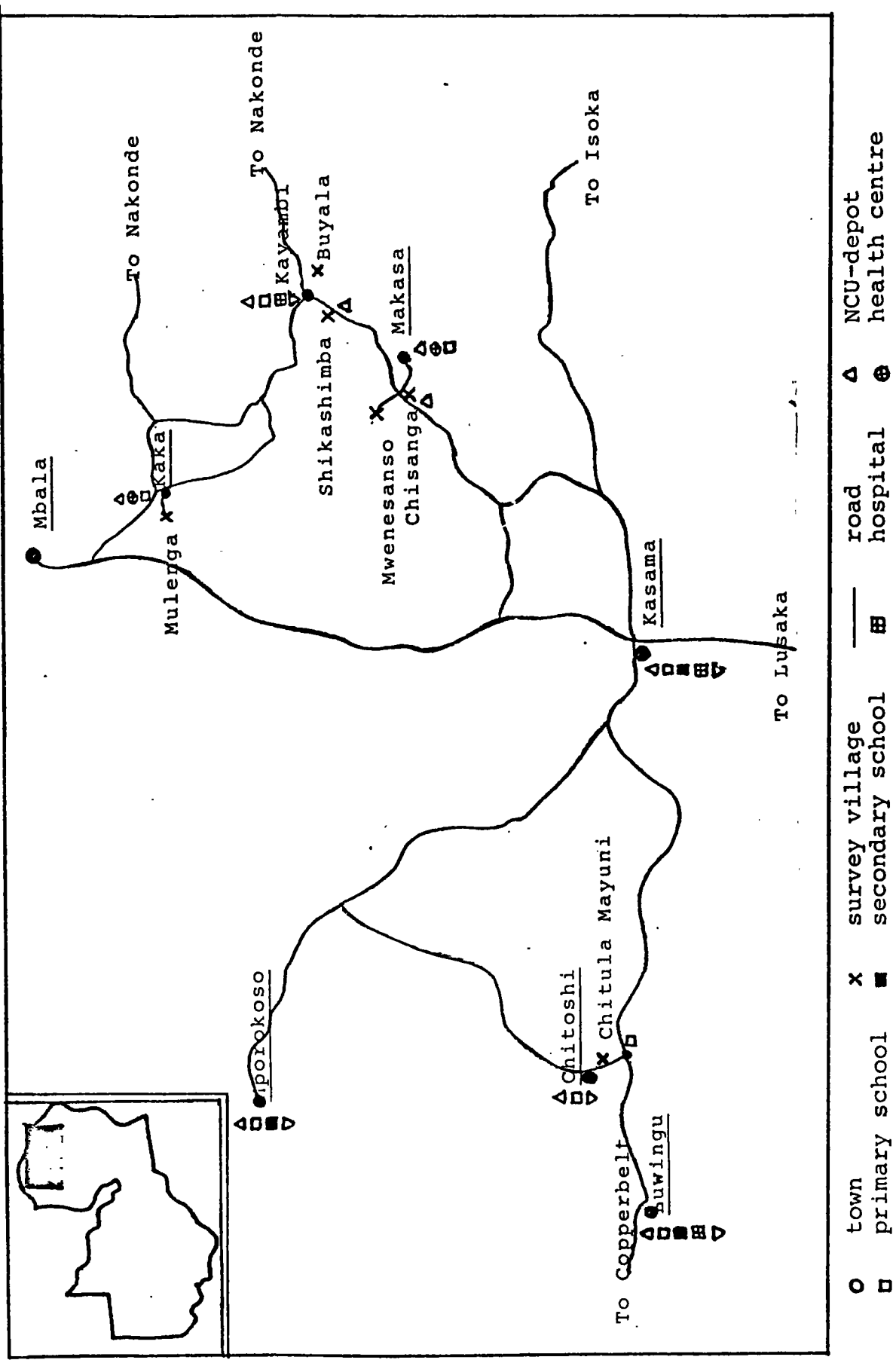
Even if the list of limitations could be made longer, we will stop here. We hope, however, that the conclusions drawn and the recommendations made will be interpreted in the same way as we would like to see them; as a basis for further discussions, rather than as final and irrevocable propositions.

IV. THE BEMBA AREA

In this area two villages were surveyed in 1981: Mwenesanso and Chisanga villages in Makasa area. Chisanga is located by the turn-off to Makasa on the Kasama-Kayambi road (D 3), Mwenesanso 6 km west of the same turn-off. In Mwenesanso all the households were covered (37), which implies that we have data at the farm level as well as at the village level. Because there were very few permanent cultivators in Mwenesanso, the sample was supplemented by including ten such households in Chisanga.

Three other villages were surveyed in the Bemba area in 1982. Two of them, Shikashimba and Buyala are located in Kayambi area. While Shikashimba is located next to the Kasama - Kayambi road, Buyala is located about 5 km from this road and is connected only by a footpath. All the households (28) in Shikashimba were covered while the corresponding number in Buyala were 37. Four households defined by the villagers as belonging to Buyala village were omitted from the survey, because they had moved from the village to live by the Kasama - Kayambi road.

MAP 3. AREA OF STUDY



The third village, Chitula Mayuni, is located in Chitoshi area about 5 km from the road linking Kasama with the Copperbelt. In this village 32 out of 35 households were interviewed, while two refused and one was absent. The communication situation varies between the areas and to some extent between the villages located in the same area. Even if Chitula Mayuni (Chitoshi area) is remotely located in relation to the District Center, Mporokoso, (about 125 km), it is favourably located in relation to the Kasama - Luwingu - Mansa - Kitwe road. There is some traffic on this road and possibilities to get lifts. Moreover, there are daily buses going between Kasama and the Copperbelt. With some luck a trip to Kasama or Luwingu and back may take only 1 - 2 days. During the harvest time the Chitoshi area is also frequently visited by travelling merchants.

The communication situation is worse in Maksa and Kayambi areas. The Kasama - Kayambi road is rather bad, specially during the rainy season. There are no bus services and few private vehicles circulate on the road. Therefore the possibilities to get lifts are limited. The railway line runs through the area, but even if cargo trains pass rather frequently it is of no help to the peasants, since passengers or small quantities of goods are not admitted on these trains. The peasants therefore have to rely on passenger trains passing once a week in

each direction. Due to the train schedules, a trip to Nakonde and return can be done in one day, while a corresponding trip to Kasama takes one week. The communication system between Chitoshi and the main markets of Kasama and the Copperbelt is thus far better than is the case of Kayambi and Makasa.

Most consumer goods can only be bought in the towns. If available in rural areas at all, one may have to pay prices up to 100% above the official prices. This, together with the marketing and employment possibilities in towns, makes the communication to urban areas essential to the peasants.

The social division of labour is weakly developed in the area. This means that most households are food producers even when the husband is employed as a civil servant or in other wage-work. Moreover, there are few variations regarding types of crops produced. The possibilities for local sales are therefore limited. Most households are self-sufficient concerning basic agricultural products.

Agricultural inputs like maize seeds and fertilizers are sold in local NCU-depots. NCU is also the official marketing agency buying agricultural produce. There are NCU-depots in Shikashimba and Chisanga. The other villages are located 5 - 8 km from the nearest depot. Buyala is worst off regarding access to marketing

facilities, since only a footpath connects the village with the "outside world". The respective location of the villages in relation to other services such as hospitals, health centers, administration offices, shops and schools are shown in Map 3. (page 21).

Broadly speaking the ecological conditions are similar in the different areas and so are the carrying capacity of the land. However, the population density varies. Mansfield calculated the population density in Chitoshi to be 1.1 to 3.9 persons/km^2 while the corresponding numbers in Makasa and Kayambi are 3.9 to 7.7 persons/km^2 (1975, Vol 5. Map 5-1). He also classified the Kayambi area as one where the critical population density for the Northern and Western Chitemene systems was exceeded. This is also true for parts of Makasa area, including Chisanga. Mwenesanso is located in a less densely populated part, and so is Chitula Mayuni in Chitoshi area. Even if chitemene cultivation is important in the whole survey area, it is therefore not surprising that its relative importance in relation to other agricultural activities is greater in Mwenesanso and Chitula Mayuni than in the other villages.

Another distinguishing feature between the survey villages is their relation to the Village Agricultural

Programme (from now VAP)[1]. Shikashimba and Mwenesanso were the first VAP-selected villages in Kayambi and Makasa areas respectively. Chisanga was selected for support during the 1980/81 season and Chitula Mayuni during the 1981/82 season. Buyala village has not been a selected VAP village and has not received any assistance from VAP.

Production systems in the Bemba area

Before we start analysing differences in production systems within as well as between the surveyed villages, we will give a short description of the systems of chitemene and semipermanent/permanent cultivation. Thereafter we will discuss some of the inherent prerequisites of the respective systems with regard to land, labour, capital and market, and finally the use of the products produced within the different systems.

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[1] VAP was started during the 1977/78 season. It is sponsored by the Norwegian Agency for International Development (NORAD) which at the moment of our studies covered three areas of the Northern Province, including Chitoshi and Kayambi/Makasa. The programme gives assistance to selected villages and individuals within these villages. The most important (but not the only) element in this assistance is to provide hybrid seeds and fertilizer to every individual who have prepared about 0.5 ha for planting. Along with the provision of inputs, technical advise and transport assistance are given.

Chitemene cultivation

The chitemene cycle as practiced in our areas of study can briefly be described as follows:
During the period from June to September the men cut bushes and lop branches off the trees within a circle of 100 - 200 m. This is exclusively a male task and women who, for one reason or another, do not have husbands or other adult male members in their household, have to seek help from men outside the household to cut their chitemene. When the trees and branches have been cut, the women carry the branches and bushes to make a 1 - 2 m high pile in the middle of the circle, depending on the density of the forest. The heap is burnt after the first rains in late October/early November and the crops planted in the ashes. First, some pumpkin, yam or gourd plants are haphazardly sown throughout the field. Thereafter, cassava and in some cases local maize and perennial sorghum are planted. These are interplanted with millet, which lastly is broadcasted all over the field. When the planting and sowing has terminated, the field is left until the millet harvest starts in May/June. In some cases fences have to be built around the chitemene field in order to protect it against wild animals.

The maize and pumpkins are harvested when ripe or when needed in the household. The finger millet is harvested by the women from May to August. It is an extremely

time-consuming task because each plant head has to be cut with a small knife. The grain is either carried to the village in baskets or stored in a temporary granary by the field if the village is located some distance way.

At the onset of the next rains the millet-straw is slashed, the soil hoed lightly, and groundnuts and/or monkeynuts are planted between the now 1 metre high cassava plants. The field is now called a "chifwani".

From the end of March the following year the groundnuts are harvested for consumption. From July to August the sorghum is harvested. When the third rainy season starts, beans are planted. Beans are also planted the following two to three years (in some cases up to five years depending on yields) before the field is left fallow. The cassava can be harvested after about two years or when needed by the household. Many households have a separate cassava field near the village and leave the chifwani cassava as an emergency food supply which in some cases is never harvested. Each household prepares a new chitemene each year, so that it will always have at least one field of millet, one of groundnuts, one of ripe cassava and one of beans. This means that new households settling in the village will either have to buy (or "borrow") fields at the different stages of the cycle; hire someone to prepare fields for them in advance of their arrival; buy their food; or be dependent

on relatives for subsistence for some years before they have established their own fields.

In all the survey villages the cutting places are largely situated so near the village that the villagers can go and come back in the same day. Very few families lived in "imitanda" (a temporary hut made near the cutting place) during the 1980/81 agricultural season.

Semipermanent/permanent cultivation

Different from the fitemene/fifwani fields which are located in the bush at some distance from the village, the permanent fields are located close to the village, preferentially near the house.

Due to the ecological conditions of the area, more permanent cultivation requires certain techniques in order to maintain a minimum soil fertility. The simplest and also the less productive technique is based on crop rotation: millet-beans and fallowing. (In a few cases groundnuts are also included in this rotation cycle). This crop rotation system is most frequently practiced in Mwenesanso. A more elaborated technique is the grass composting (fundikile) which is more frequently found the nearer one comes to the Mambwe region, where this cultivation system is dominant. Fundikile is thus most common in Shikashimba and Buyala. It is found, but less frequently in Mwenesanso and Chisanga, while it is quite rare in the Chitoshi

area.

The fundikile system is usually practiced on land that has been left fallow for 3 - 6 years and is covered by tall grass and bushes. At the end of the rainy season, usually from the middle of March, the grass and bushes are cut and gathered in small piles of 2 - 3 m in diameter, which are covered with soil. Before the next rainy season starts, the mounds are spread to make flat seedbeds. In this way the grass-mounds act as a form of compost, supplying the new crop with nutrients. Finger millet, maize, beans or groundnuts may be grown for three to four seasons before the field is left fallow again.

The crop rotation and fallowing and the fundikile systems are developed locally and mainly based on the use of local resources. Fertilizer may be used, but rather occasionally.

A third production technique is what we will call the "new technological package" which includes the use of hybrid seeds and fertilizer. It is used mainly for maize production. The new way of producing maize is not fully adopted by the peasants, in spite of being given high priority by the extension service and aid agencies in the area, thus following up government policies of increasing production. The maize is planted from medio November to medio December. If fertilizer is used, it is normally applied when the plant has germinated and

has about two to three leaves. The extension officers recommend that a basal dressing of x-compound fertilizer should be applied before planting. Many cultivators do not follow this recommendation. They consider it a waste of fertilizer in case of bad germination. Once the plant has germinated they dig a hole beside each plant where the fertilizer is placed. In this case only the soil around each plant is fertilized. Some peasants make a second application of fertilizer when the plant is about 40 - 50 cm high, but this is not a widespread practice.

Even if the peasants are recommended to weed the maize two to three times, they usually weed only once, during January/February. Weeding of maize is a time-consuming task. Moreover, it competes for labour with the ridging and planting of beans. We could observe maize fields where weeding obviously had been neglected, but these were mainly non-fertilized maize fields.

When the maize is mature, small quantities of green cobs are gradually harvested for consumption. The major part of this crop is left to dry in the field until June/July. Then the cobs are harvested and stored in bins near the house for about one month before being shelled, put into bags for sale to NCU.

The importance of mealemeal in a household's total

consumption of grains is highly determined by the access to hammermills. There are hammermills in Chisanga and Shikashimba. In the other villages people have to rely on manual processing, using grinding stones. Such processing of maize is considered heavier and more time-consuming than is the case for finger millet and cassava. In villages without access to hammermills, the consumption of maize for nshima is therefore rather limited.[1)]

In addition to their chitemene and permanent fields most villagers have fruit trees and vegetable gardens situated partly around their houses, partly near a stream, where water is easily available. The products most frequently grown are: bananas, mangos, cassava, tobacco, pumpkins and sweet potatoes. Some of the villagers have a big variety of products in their gardens, others have only 3 - 4 products always including bananas and cassava. The products from the "village gardens" are mainly for subsistence even if ocasionally sales take place locally.[2)]

Production systems and land requirements

From the point of view of land requirement there are marked differences between the production systems. The chitemene system is by far the most extensive one.

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1) Nshima is a porridge which may be prepared of maize, millet or cassava, or a mixture of cassava with one of the other mentioned grains. Nshima is the staple in the peasants' diet.

2) For more details, see Haug, 1983 and Holden, 1983.

Svads, referring to calculations made by Allan and Mansfield, argues that approximately 40 ha per person are needed, when 60 per cent of the land is suitable for chitemene cultivation (Svads, 1983, Allan, 1967, Mansfield et al, 1975)[1]. According to these calculations a household composed of 5 - 6 persons (the average size in the survey villages was 5.5) would need about 220 ha in order to secure the long-term viability of the system. Evidently, this production system is incompatible with larger concentrations of permanent settlement. In Mwenesanso we calculated that the 205 villagers were 80% dependent on chitemene cultivation. Slightly less than 50% of the land allocated to the village is suitable for this kind of cultivation. Ecologically viable chitemene cultivation would therefore require that the peasants cultivate fields further than a radius of 8 km from the village during a 25 years cycle[2]. This is not possible without at least temporary break-ups from the village (living in imitanda).

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1) The actual carrying capacity of the large circle chitemene cultivation varies within the area, according to 1) the amount of woodland needed to make the ash garden (poor vs. more thickly wooded land), 2) the proportion of woodland (suitable for chitemene burning) to total land surface and 3) the period required for regeneration of woodland after lopping (Allan, op.cit.)

2) For more details, see T. Vedeld, 1983 pp. 98-100.

In this particular case reduction of the regeneration period is practiced in order to overcome the problem of distance. The regeneration period is reduced to about ten years (or even less), which will have negative long-term ecological consequences. Moreover, chitemene cultivation is combined with more intensive systems from the point of view of land requirement: semipermanent and permanent cultivation. This combination increases the carrying capacity of the area.

The carrying capacity of the fundikile system is calculated to be approximately 2.5 - 4.5 ha per person (Svads, op. cit.) This would require that the average sized household of our sample would need 14 - 25 ha.

The carrying capacity of a system based on systematic use of fertilizer should be considerably higher. However, we have not been able to find data confirming the actual carrying capacity of this system in the area. One may also question the long-term ecological consequences of sustained use of fertilizer. Obviously, production systems with high carrying capacities are more compatible with permanent settlement.

Production systems and labour requirements

Considering use of labour there are certain differences between chitemene and semipermanent/permanent cultivation

which deserve to be mentioned. First, the sexual division of labour in permanent cultivation is not as strict as in the case of chitemene cultivation. Millet is normally harvested by women, also when grown on permanent fields. All other activities, however, can be and actually are done by both sexes. Thus, the sexual composition of the household is a less critical factor in permanent cultivation than it is in chitemene cultivation. This will be discussed below.

Second, the seasonal labour demand varies between the different systems. In chitemene cultivation the agricultural activities are spread throughout the year. According to Richards, a Bemba requires a minimum four weeks' work during the dry season to clear a chitemene garden, but actually uses two to three months interspersing this task with others (Richards, 1937 pp 381-405). When the field is burnt and planted by mid-November, it is left until the harvest. Then groundnuts are planted in the second year chifwani field from late November to early December. The most time-consuming task in this cultivation system, is the ridging and planting of beans. This is done in January and February in the third year (and subsequent) chifwani field. However, if labour is scarce, the planting of beans can be postponed up to mid-March, without major problems.

The agricultural cycle in permanent cropping starts after the first rains. No preparation of land is done during the dry season, so when the rains starts, preparation of fields and planting of all crops, except late beans, should be done. Another labour peak comes in January/ February when the maize should be weeded and the main beans crop planted. Due to relative scarcity of labour, many peasants cannot cope with all the required activities during these peak periods. We observed several fields of maize which did not mature due to late planting[1].

The above presentation shows that a change from chitemene cultivation to more permanent cropping implies changes in labour requirements and in the organization of labour.

Production systems and capital requirements

Chitemene cultivation is, as we have mentioned above, exclusively based on the use of local resources and skills. The same is true for the semipermanent crop rotation/fallowing and fundikile/fallowing systems. However, this is not so as far as the permanent systems, including use of new technology (seeds and fertilizers), are concerned. This technology is mainly used in maize production. Purchased inputs are needed in order to produce, which in turn requires

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1) Late planting of maize may also be due to late deliveries of seeds and fertilizers.

sale of products in order to initiate a new production process. Thus, even if some local maize without use of fertilizer is produced and some of the hybrid maize is consumed by the household, maize production is almost per definition a cash crop. The introduction of hybrid maize requires initial capital inputs which generally have to be provided by other sources than traditional agricultural activities. It is therefore not surprising that in our survey area fertilizer is most frequently used in the villages which have received support from VAP. In Shikashimba 18 households used fertilizer on their maize fields during the 1981/82 season.

In Chitula Manyuni only three households grew maize applying fertilizer before the 1980/81 season. During the 1981/82 season when the village got support from VAP, this number increased to 16. However, once using fertilizer does not mean always using fertilizer. In Mwenesanso, VAP-selected village in 1977/78, thirty households (out of 37) said that they had received free fertilizer from VAP. Five of the remaining did not live in the village at the moment of VAP support. However, only two producers have continued using fertilizer in a systematic way since then. They are the only ones that have been able to really adopt the "new technological package".

During the 1980/81 season ten producers used fertilizer.

They applied it on the following crops: finger millet (3), local maize (1), hybrid maize (4), beans (1) and sunflower (1). The following statements from different Mwenesanso cultivators illustrate the level adoption of the "new technological package":

"With some of the money I earned doing piece-work, I bought half a bag of x-compound for my 2 lima field of local maize" - (The maize was consumed by the family).

"I bought 1 bag of x-compound with money earned by selling Katata[1]. I used it on my millet field (0.6 ha) to increase the yield of millet".

"Last year I sold groundnuts and mats and bought some fertilizer, this year all the money was spent in buying clothes, but I hope I will have some next year for buying fertilizer."

These statements indicate that the mere use of fertilizer do not express a sustained use of a "new technological package" where fertilizer is the main component. Moreover, when fertilizer is applied, the quantities are often far from adequate. This is also the case in Shikashimba, which is the village of our sample where maize cultivation with fertilizer is most widespread. During the 1980/81 season, 89 bags of x-compound fertilizer were applied on

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1) Katata is a local beer made from fermented maize and finger millet.

17.5 ha of maize giving an application rate of 260 kg/ha, while the extension officers recommend the use of 400 kg/ha. If we consider that the 260 kg/ha are unequally distributed between the households, we can conclude that the adoption of the "new technological package" is far from reached by all producers.

In Buyala which is the only village without any VAP support, the use of fertilizer is proportionately lower than in the other villages. Only four households applied fertilizer during the 1980/81 season and at very low rates, while 24 households produced small quantities of local maize for consumption.

Our findings indicate that the adoption of the "new technological package", beyond the level of a limited number of "entrepreneurs", requires special financial support and well-functioning marketing services. Introduction of new technology also requires introduction of new skills. Thus it should be followed by a training component.

The above description shows that the different production systems have different requirements regarding land, labour and capital. This is important to keep in mind when we discuss differences in production strategies found in our area of study.

Production systems and use of products: Subsistence vs. cash crops

Broadly speaking one can say that production on chitemene/chifwani fields are mainly for subsistence, while production on permanent fields are partly for subsistence, partly for sale. This distinction is related to the crop patterns of the respective systems, which are partly overlapping and therefore need to be discussed in some detail.

Finger millet and cassava are the products most frequently consumed as nshima, while beans and groundnuts are the most important ingredients for relish, which is served with the nshima. These crops are mainly, but not exclusively grown on fitemene/fifwani fields.

Maize, beans and cassava are the crops most frequently grown on permanent fields. Some households also grow smaller quantities of finger millet and groundnuts under more permanent conditions. However, finger millet, cassava and groundnuts are mainly subsistence crops whether grown on fifwani or permanent fields. When grown on permanent fields, this is often done in order to supplement the subsistence production from the bush fields or, in the case of finger millet, in order to brew beer for "ukutumya" (work-for-beer-parties) or for sale. The household's food requirements rather than its need for

cash incomes determine the production of these crops. The small quantities of produce sold are rather related to surplus production of food than part of a cash cropping strategy.

The low prices paid by NCU do not stimulate the peasants to produce millet and groundnuts for sale (NCU does not purchase cassava). The prices paid locally are higher, but the demand is rather limited due to the fact that most households in the area produce enough to meet their own needs. At the same time those households which can not produce enough food, e.g. some female-headed households, also lack the money to buy additional food. They have to rely on cassava for nshima and wild leaves for relish in order to supplement their own scarcity of grains. A more long-distance trade of cassava is almost impossible under the existing conditions, because it is an easily perishable crop. This is not the case for millet and groundnuts, but the relation between weight, volume and price/demand make them less "profitable" for trade over longer distances compared to beans.

Beans is an important cash crop even when grown on bush fields. Up to the 1980/81 season the NCU paid a relatively high price for this crop. During the 1981/82 season, the price was reduced by about 30% due to excess of production compared to NCU's capacity for further sales.

The price paid by NCU is now approximately one half of the price one can obtain by selling privately. A local demand exists, but is limited. Therefore peasants who want to sell their beans for higher prices, can either rely on private merchants or travel to the Copperbelt or the Tanzanian border and trade it themselves. As we will see later, this is a more or less attractive solution in the different villages depending on distance to the market and transport facilities, which in turn determine costs of transportation and drudgery of labour.

In villages where start capital has been made available and the transport and marketing services are working reasonably well, maize is the most important cash crop. Even if small quantities of local maize for own consumption is produced on fitemene fields or near the house, hybrid maize is generally grown on permanent fields by using the "new technological package".

From the above presentation we can conclude that the distinction between chitemene/chifwani cultivation and subsistence production, on one hand, and permanent cultivation and subsistence/cash crop production on the other, is more complex than our initial division may indicate.

Table 1. Number of households with different production systems by villages.

Areas	Makasa Area		Kayambi Area		Chitoshi Area
Prod. system	Mwenesanso village	Chisanga* village	Shikashimba village	Buyala village	Chitula Mayuni village
Chitemene only	12 (33%)	0 (-)	5 (18%)	11 (30%)	16 (50%)
Chitemene "combi"	23 (62%)	1 (10%)	23 (82%)	21 (57%)	14 (44%)
Permanent only	2 (5%)	9 (90%)	0 (-)	5 (13%)	2 (6%)
No. of households in the village	37 (100%)	10 (100%)	28 (100%)	37 (100%)	32 (100%)

* The whole village approach was not used in Chisanga. Ten peasants were selected in order to study "permanent" cultivators, a group that was too small in Mwenesanso.

Land use and production patterns in the survey villages

From Table 1 we see that the number of peasants practicing chitemene cultivation is high in all the villages. If we exclude Chisanga (which is necessary due to the special selection procedure), we find that 125 (93%) of the 134 households included in our survey practice chitemene cultivation. The relative importance of chitemene, however, varies from one village to another. First, the number of households practicing chitemene only, varies from 5 (18%) in Shikashimba to 16 (50%) in Chitula Mayuni, while Buyala and Mwenesanso have 12 (30%) and 11 (33%) respectively. Except from Chitula Mayuni, where half of the households practice only chitemene cultivation, the majority of the households combine chitemene with permanent cropping. This is most marked in Shikashimba, where, for reasons analysed below, 23 (82%) of the households practice "combined" production, while there is no households without chitemene/chifwani fields. The number of such households is also quite limited in the other villages, varying from five per cent in Mwenesanso to 13 per cent in Buyala.

If we look at the households within each category of production systems, we will also find differences regarding size of cultivated areas, which need to be analysed.

In the following pages we will discuss differences in production systems (as reflected in Table 1) with regard to the socio-economic variables listed in our model of analysis.

Labour

Households as units of production

In the first chapter we argued that the basic unit of production is the household[1]. This means that the production unit is not merely a productive organization constituted by so many "hands" to work on the fields; it is also a unit of consumption, containing as many mouths to feed as there are workers. Moreover, it does not merely feed its members, it also supplies them with many other services, e.g. children have to be raised and socialized to the demands of the adult world and old people have to be cared for. In such production units the economic organization is highly determined by the size and composition of the household and by the coordination of its consumptive demands with the number of working hands (Chayanov, 1966, Wolf, 1966).

In the survey villages agricultural production is primarily subsistence oriented. Money is not absolutely essential in order to survive. From a nutritional point of view, however, it is important to supplement the diet provided by agricultural products with e.g. fish and meat. In many villages these are not obtainable and thus have to be bought. Moreover, people need clothes, and there

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1) The problem of defining households in the area of study has been discussed elsewhere (Vedeld & Øygard, 1983).

is no local textile production, and they need school uniforms and utensils if they want to send their children to school. Therefore, the peasants also need money. Most households try to combine their resources in such a way that they can meet food as well as cash requirements. Food requirements are mainly met by products from chitemene/chifwani fields. We have seen that 93% of the households practice this type of cultivation. However, most of them combine chitemene with semipermanent/permanent cultivation which generally includes a cash crop component. The extent to which the different needs are met and how they are met, depends on a series of factors. We will now consider the impact of the demographic composition of the households within the three production system categories outlined above.

Household composition

If we consider the households practicing chitemene only certain pattern appears which is representative for the whole sample. The households most frequently found in this category are: Newly established households, female-headed households and "old" households.

A newly established household consists of a recently married couple without children or with one or two infants. The process of establishing an independent unit of production normally starts with chitemene cultivation.

No start capital is needed and the necessary skills have been aquired during the socialization process. Moreover, these households generally live next to the wife's parents or some other closely related kinsmen. They are partly dependent on them for food support until they reach the stage in the chitemene cycle, when all subsistence crops are produced. Furthermore, they are expected to help their kinsmen to work their fields, which in turn limits their possibility to expand their own cultivated area.

The female-headed households are generally composed of a divorced or widowed woman and her minor children. They lack adult male members. They have an unfavourable ratio between producers and consumers, and as far as chitemene cultivation is concerned, an unfavourable sexual composition. In most cases they are put under the care of a male relative, who assists in cutting chitemene. Otherwise they have to arrange ukutumya or hire piece-workers in order to have their chitemene cut. The latter requires money, which is generally very scarce in this type of household. The lack of money also prevents them from producing crops which requires purchased inputs. Given their critical labour and capital situation, chitemene is the best alternative in order to secure food requirements. It provides a reasonably varied diet. Moreover, eventual surpluses may be sold. This is not so with

the "cassava strategy" adopted by some female-headed households, which are not able to mobilize male labourers to cut chitemene. Their diet is poor and there is no market for surplus cassava.

Broadly speaking, the female-headed households get their cash incomes from local piece-work rather than from cash cropping. This is a short-term strategy, reducing their possibilities of working on own fields. Working their own field would secure future harvests and better food and cash supply. They may therefore easily be caught in an evil cycle: A small chitemene results in little millet for eating and even less for brewing. This in turn implies a shortage of beer for sale or for ukutumya which may result in an even more critical labour shortage.

Different from the type of households referred to above, the "old" households have a favourable ratio between producers and consumers. They are generally composed of an old couple, sometimes with one or two more or less grown-up children. The rest of their children are already adults and established as peasants in the village of the parents; in some other village; or they have migrated to be employed as wage-workers. These households have literally retired to chitemene cultivation, with practically no agricultural production beyond what is needed for own consumption.

On the one hand, consumption needs have changed. On the other hand it is possible that their priorities also have changed. As one informant put it: "When food is secured, no work, just sit and eat, I am old". However, curtailed consumption is only a partial explanation of this "retirement". One should not underestimate the importance of additional "incomes", which reduce the cash needs of these households. We found that many of them received gifts, especially clothes from migrated kinsmen. Moreover, they may have incomes or savings, thanks to brideprices received upon the marriage of their daughters and sisters' daughters. However, we were not able to make a systematic registration of such incomes.

In the category of "chitemene only", we also find some households which cannot be characterized as being in one particular phase of their developmental cycle. On the one hand we find entire households recently returned from labour migration. Like the newly established households, they are in an initial phase with regard to agriculture. This is not the case regarding the household unit as such. On the other hand, we find households with considerable cash incomes from economic activities other than agriculture. The husbands are engaged in wage labour, fishing or bricklaying and spend much of their time in these activities, while the wives are in charge of agriculture, once the chitemene gardens are cut.

From the above presentation we see that many of the households practicing chitemene cultivation only, find themselves in a phase of their developmental cycle which makes it impossible or undesirable to combine chitemene with more permanent cultivation.

Due to the sexual labour division in chitemene cultivation and the fact that most households will have only one adult male producer during a period of about 15 years, when the household is in its "expansion phase", it may be impossible for a given household to expand the bush fields sufficiently in order to meet increasing food requirement[1]. It is also during the "expansion phase" of a household's development cycle, when the ratio between producers and consumers is low, that the need of cash incomes may be are highest, especially due to the need of school implements for the children. If cash incomes are not available, many chitemene cultivators fail to send their children to school.

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1) Fortes distinguishes three main stages or phases in the developmental cycle of the domestic group: 1) Phase of expansion, that last from the marriage of two people until the completion of their family of procreation. This corresponds to the period during which the offspring are economically, affectively and jurally dependent on their parents. 2) The phase of fission (often overlapping the first phase). This begins with the marriage of the oldest child and continues until all children are married. 3) The phase of replacement, which ends with the death of the parents and the replacement by their heir (Fortes, 1958). The different phases implies differences with regard to the labour capacity of the unit.

Whether the change in household composition during the expansion phase will be followed by a change in production system depends on a series of factors. If reasonable cash incomes are available from other sources than agriculture, the household may, as we have seen, adopt a "permanent" economic organization based on chitemene cultivation e.g. combined with wage work.

Moreover, the intervillage differences regarding the number of households practicing chitemene only (see Table 1) also reflect differences in opportunity structures outside the household. In Chitula Mayuni 50 per cent of the households practice exclusively chitemene cultivation. This can only partly be explained by the demographic composition of the households. Due to the favourable location with regard to the Copperbelt beans is the main cash crop in this village and, as we have mentioned previously, beans is produced on fifwani as well as on permanent fields. If the cash strategy is related to maize production, as is the case in Shikashimba, permanent cropping will be proportionately more important. Such intervillage differences will be discussed later in this chapter.

When we consider the households within the category of "combi-producers", we find that most households are in their "expansion" or "fission" phases in the household's

developmental cycle. Subsistence crops like millet, cassava or groundnuts may be cultivated on permanent fields in order to supplement food production from the bush-fields, and cash-crops like maize and beans may be grown in order to meet the increasing cash needs during these phases of the household's developmental cycle.

The production of subsistence crops whether grown on chitemene or permanent fields is determined by the consumption needs of the household. When the number of consumers increase, a corresponding increase is normally found in the size of cultivated area. However, this is not true for households which find themselves in a critical situation regarding their composition by sex, age and producer-consumer ratio, like the female-headed households mentioned above. Such households may be dependent on help from others in order to meet even basic food requirements.

As far as cash-cropping is concerned, size of cultivated area will depend on the amount of available labour when subsistence production has been secured[1)]. Increase in cash-crop production often coincide with a phase in the household's developmental cycle when the children are adolescent and start to participate more actively in agricultural production.

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1) For more details, see Vedeld & Øygard, 1982

From Table 1 we can see that relatively few households practice permanent cultivation only. As we will see this is an expression of quite different resource situations at the household level. They represent the worst off, on one hand, and the best-off, on the other.

In Buyala we find five households in this category. One is composed of a young couple without children, just returned to the village. It has initiated its agricultural activity by planting a small area of cassava and was about to start cutting the first chitemene garden. The remaining households are composed of divorced or widowed women and their children (one woman is married to a labour migrant). They produce cassava as staple because of lack of adult male labourers to cut chitemene. In Shikashimba no household cultivates on permanent fields only, while there are two households in this category in Chitula Mayuni. One is similar to the first mentioned in Buyala, i.e. young couple just returned to the village. The other is composed of a young couple with small children and the wife's two adult sisters. The husband works as a VAP tractor driver and started maize production during the 1981/82 season with support from VAP. Thus, in these villages the households producing on permanent fields only, either find themselves in a very critical situation concerning household labour, or they are in a transitory situation and have probably already changed their prduction system by now (except the VAP employee, who probably

continue combining maize production with wage-work).

The situation of the Mwenesanso (2) and Chisanga (9) households producing on permanent fields only is quite different. All of them produce maize for sale using hybrid seeds and fertilizer. It is, however, interesting to notice that except for the maize, the crop pattern is not very different from the rest of the villagers. They continue producing finger millet and cassava and for the majority, millet and cassava are more used than maize for nshima.

One household composed by a young couple and a recently born child, has just started maize production. They live next to the husband's father, who is a well-off maize producer, and plan to expand their permanent fields rather than to start chitemene cultivation. All the remaining households have a ratio between producers and consumers which is far above the average. It is interesting to notice that eight out of eleven heads of households are polygamists (two of them married to three wives), while the remaining two have adult kinsmen other than the nuclear family members living in the household.

The above presentation indicates that the household size and composition by age and sex play a central role in the allocation of resources. The households give first priority to food production. In the actual situation chitemene

cultivation is considered the safest way to meet food requirements. The food requirements of a given household are determined by its number of consumers. On the other hand, to what extent and in which way these food requirements are met also depend on the number of producers. We have seen that only households with a very unfavourable ratio between producers and consumers are not able to be self-sufficient regarding food production, while the sexual composition to a certain degree determines whether food is produced on fitemene or permanent fields.

The land use and the size of the cultivated area are not exclusively dependent on household labour. Several mechanisms are used in order to recruit additional labour force. Some of them are regulated by kinship and neighbourhood, others through the market.

Some implications of kinship [1]

There seems to be a close connection between household and family. In Mwenesanso, for instance, about two thirds of the households are composed exclusively of nuclear family members. Only in the case of relatively newly established households nuclear family and household are identical units. In "older" households only part of the nuclear family members are at the same time household

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1) The data on kinship and marriage is mainly based on the 1981 study. Due to a somewhat different focus in the 1982 study, these apsects were given less attention.

members. Grown up children have migrated to marry or to get employment outside the village, or they have married and established their own households in the village. The remaining households are either composed of extended families, i.e. they have members who do not belong to the nuclear family or they consist of a man with two wives and their children.

Kinship is also important regarding settlement pattern, collaboration between households, and inheritance, which in turn influence resource allocation at the household level.

Traditionally, settlement pattern in Bemba villages was mainly uxorilocal (i.e. the husband moved into his wife's village upon marriage). Now this is less dominant. In a number of cases both spouses or neither of them are born in the village. However, most households in a village are linked to one or more other households through kinship ties. In Mwenesanso, where kinship ties were systematically registered this was found to be true for all households.

This kinship web does not mean eating and working together. Each household is autonomous and fend for itself as far as basic requirements are concerned. The exception from this are the female headed households. These are brought partly under the care of one household unit rather than left to the mercy of every member of the kin

group, however closely knit it may be.

Mutual obligations underlies kinship coherence. This is kept to a scale and in such a balance that no household unit is isolatedly independent of or totally dependent on others. Exchanges of goods and services between households is quite common and seems to be governed by a code of reciprocal obligationgs. In the Bemba villages this is, may be, most evident when it comes to household activities. In the early afternoon one can observe women and children collaborating in the processing of food; e.g. grinding millet, pounding cassava, shelling groundnuts, and cooking. Our observations indicate that the collaboration mainly takes place among kinswomen (sisters, mothers and daughters etc.)

Exchange of labour for certain agricultural tasks also takes place. This is institutionalized through the ukutumya. Even if the participation in work-for-beer-parties is not strictly governed by kinship ties, kinsmen are more easily mobilized than others. Kinship obligations are also important in times of crisis, for example loss of crops, illness or death.

However, kinship obligations may also work as a brake on the economic development for individual households. If a peasant is successful in agriculture, he is expected to be generous with his kinsmen, if good terms are to

be maintained between them. Accusation of witchcraft is frequently used against people who try to break with the expected norms of kinship obligations. One well-off maize-producing peasant in Mwenesanso emphasised the importance of not having close kinsmen living in the village and no "disasters" among his close relatives living elsewhere. We will use the case of one of his neighbours to illustrate this point: This man was extremely unlucky, in the sense that two of his brothers-in-law died at the same time, leaving their middle-aged wives with minor children, and therefore not attractive for potential new suitors. Being their only brother, he had to leave his wage employment and go back to the village to take care of his relatives. His economic position was quite miserable, he was not even able to send his own school-aged children to school.

This case, as well as cases from the other survey villages, confirm the statement made by the Mwenesanso peasant.

According to inheritance rules and practices among matrilineal people like the Bemba, it is normally not a man's own children who will inherit him, but his sisters' sons. His own children will inherit their mother's brothers. If uxorilocal or neo-local settlement upon marriage is practiced, the potentional heirs do not constitute a local group, they live in different places. This

inheritance system may conspire against the consolidation of property within the mainly nuclear-family based households. Among the patrilinear Mambwe, borthers and sons are the potential heirs. Their practice of virilocal residence (i.e. the wife moves to the husband's village upon marriage), unite the male relatives. As they have claims to inherit each others properties they are also interested in the consolidation of the property of each individual household. The existence of patrilinear kinship with all its implications, thus, seems to be more compatible with individual accumulation, than is the case of matrilineal kinship.

Polygamy as a source of additional labour

In Mwenesanso and Chisanga we found that polygamy was related to economic position. The polygamists were economically better off than the other producers. Our impression is that polygamy, in many cases, is part of an expansion process especially among permanent hoe cultivators, where the sexual division of labour is less strict than among chitemene cultivators. Polygamy among chitemene cultivators implies more work for the man. He will have to cut two fitemene, one for each wife. Polygamy among permanent hoe cultivators means extra labour force without necessarily extra labour input from the man. Statements from the villagers regarding the advantages of polygamy confirm this. Except the two Mambwe polygamists in Mwenesanso, who emphasised

many children and social prestige as reasons for marrying more than one wife, the Bemba polygamists argued that extra labour force was the most important advantage. This view was confirmed during informal discussions with informants in Shikashimba, where permanent cultivation is widespread. On the other hand, male informants in Chitula Mayuni (where chitemene cultivation dominates) did not agree. More wives mean more work for the men, they said.

Compared to the first wife, the marriage of the second/third wife implies less expenses, as the brideprice often is considerably lower. (In one case 1 K, in another "free of charge"). This seems to be related to the social position of the women. In most cases the second wife is divorced, deserted or widowed, which is normally not the case of the first wife. The second/third marriages seem to be less stable ones. We registered a relatively high divorce rate among the interviewed villagers and in most cases the divorcee was a second wife.[1] This is also related to the matrilocal residence pattern where the men are settling in their first wife's village. The subsequent wife / wives move into the first wife's domain and the conflicts this often imply are stressed by men as well as by women. The reasons for divorce most frequently given by divorced men were the following; "The bad

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1) In Mwenesanso 25 per cent of the heads of households had been divorced at least once. They divorced from: first wife (1), Second wife (7), third wife (2) and fourth wife (1).

character of the wife", "we were on bad terms", "she did not like to stay here, she ran away".

Polygamy is not necessarily conceived negatively by the women. In one case a man had married his first wife's sister's daughter. The first wife who, like her husband, was in her fifties, saw her co-wife as a collaborator rather than as a rival. We had no opportunity to ask the younger second wife if she shared this opinion. The other women with whom we discussed this question, said that they would have preferred to be their husband's only wife.

The differences in the conception of polygamy that we found among Bemba and Mambwe polygamists in Makasa area (confirmed by the material from the Mambwe area to be discussed later) are probably related to the differences in kinship systems between the two tribes. The children of a matrilineal Bemba man do not belong to his lineage as is the case among the patrilineal Mambwe. To have many children, thus, has other implications for him than for a Mambwe who sees in his children the expanison of his lineage and the enhancing of his own social prestige.

We have now seen that agricultural production in the Bemba area is mainly family based and further discussed how other kinship ties may be mobilized to supplement the household labour. Absolute or relative scarcity of labour

in the household can also be resolved by other means, through ukutumya or hired labour.

Ukutumya

The practice of ukutumya is common in all the survey villages. It usually takes place in the following way: A woman brews one to three calabashes of chipumo (millet beer). The day before the beer is ready, she or her husband will stroll through the village boasting about the taste and strength of the beer and urging people to come to their ukutumya the next day. At the ukutumya the participants work together cutting chitemene, preparing fundikile, making ridges for maize or other tasks for some 3 to 5 hours. Afterwards they go to the host's house where they are served beer.

There are no big differences between the villages regarding frequency of work-for-beer-parties. There are, however, pronounced variations in the type of work done. This was registered in 1982 study. We found that variations were related to intervillage differences regarding crop patterns. Broadly speaking the labour input from ukutumya was used partly for cutting chitemene, partly for preparing fields for different crops. It was not used for weeding and harvesting.[1)]

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1) For more details; see Vedeld & Øygard, 1983, p.p.95-97.

According to our calculations the "expenditures" per man-/day in ukutumya was approximately K 0,50. This is about the half of the wage paid to a hired labourer.

Such cost differences may be explained by the fact that ukutumya involves reciprocal obligations. If members from one household participate in a work-for-beer-party, they can expect participation when they arrange one themselves. However, the reciprocal obligations are not strictly followed. There is a marked difference in the number of households arranging ukutumya and the number of households taking part in ukutumya (e.g. 15 to 29 in Shikashimba). One explanation for this is that finger millet is necessary for brewing chipumo and several households said they did not have a sufficient surplus of millet for this purpose.

Households with a sufficient store of finger millet can therefore use ukutumya to mobilize cheap extra labour to secure subsistence production or increase cash-crop production. But, in spite of the lower cost of ukutumya than of piece-work labour, many peasants said that they preferred to hire occasional workers rather than to arrange ukutumya: "Too little work is done in an ukutumya". Several households which could afford to arrange ukutumya therefore did not do so. But they might still take part in the ukutumya of others; "out of respect", as one informant said.

A household may arrange ukutumya to overcome labour peaks or to get tasks done which it is not able to cope with alone, e.g. cutting chitemene in the case of female-headed households. But ukutumya is also a social occasion, a party where gossip is shared and where those who otherwise cannot afford to drink beer can get a sip. And work may of course be more pleasant when it is done in a group and there is a promise of beer-drinking afterwards.

Hired labour

Broadly speaking the use of hired labour is limited compared to the total labour input in agriculture. It is unequally distributed between the villages ranging from two households using about 15 man/days in Mwenesanso to 15 households using 264 man/days in Chitula Mayuni. Moreover the number of man/days used and the reasons for hiring labour vary between the households in the respective villages. We will use some examples in order to illustrate this variation:

In Chitula Mayuni four households hired more than half of the total input of hired labour in the village: One household where the husband receive a monthly pension (38 K) hired 36 man/days for ridging and weeding maize. A VAP-employed tractor driver hired 60 man/days for clearing his maize fields (there are 3 adult women living in the household). A third household hired 30 man/days

for cutting chitemene while the husband was in the hospital, and finally one household where the head of household was lame, hired about the same number for the same purpose.

In Buyala, the household of a Kayambi Mission employee hired labour to cut chitemene, while the household of a hammer-mill owner in Shikashimba hired 40 man/days for making ridges for maize.

These examples from Chitula Mayuni, Buyala and Shikashimba give a picture of the variations regarding reasons for hiring labour found in our sample. [1)]

We can distinguish between labour hired in order to meet subsistence needs and labour hired in order to increase cash-crop production. Hired labour is employed for subsistence production in the following situations:

a) in cases of crisis, e.g. if the husband is unable to cut chitemene because of illness or old age; if the household is left without males for cutting chitemene because of death of husband, divorce, etc.; and in other cases of acute labour shortage.
The households' cash reserves are scarce, and spending cash on subsistence production is only done under special circumstances, when the household's survival is at stake.
We would expect a large part of the hired labour for

1) For more details; see Vedeld & Øygard, 1983, p.p. 92-95.

cutting chitemene and making cassava-mounds to be of this crisis-solution type.

b) In cases where household labour is more profitably employed in other activities than agriculture. The case of the Kayambi Mission employee illustrates this. In such cases the amount of hired labour does not exceed the amount needed to secure the subsistence needs of the household.

When hired labour is used in cash-cropping, it is part of a strategy to increase production, saleable surplus and the household's cash income. We would expect that most of the hired labour used for maize cultivation (and beans in Chitula Mayuni) to be of this kind. For these crops it is evident that labour is hired to meet certain labour peaks, i.e. at the time of ridging and planting of maize and beans.

Some hired labour is also used for "other activities". These include specialist tasks such as bricklaying and the making and filling of windowframes and doors.

From the above presentation we can conclude that on the one hand, the use of hired labour express scarcity of labour, or scarcity of certain type of labour (e.g. males) necessary for a given household in order to meet its food requirements. On the other hand, it may express

scarcity of labour in order to obtain a level of consumption above and beyond the limits set by the household's mere subsistence needs. This will be found in certain contexts, where a favourable combination of labour, capital and marketing facilities exists.

The lack of cash-crop production in a household can in some cases certainly be explained by the lack of available labour. However, this is not a valid explanation in all cases. We find households with favourable ratios between producers and consumers, where the labour capacity of the household is underemployed because of marginal disutility of labour. This marginal disutility is not determined by the fact that the consumption needs for the households are reached. They may be reached as far as they can be met by own production. We have seen previously, however, that certain needs e.g. for fish and meat, clothes etc. can not be met through own production. The peasants have to sell their labour force, sell products from agriculture or other activities to make money for buying certain required commodities. Sales of agricultural products are possible only if there is a market for such products.

Furthermore the mere existence of markets is not sufficient, transport facilities must also be available. A peasant may transport one bag of maize 8 km on his head to sell

it in the nearest NCU-depot. However, he will hardly be able or willing to transport 20 bags or more. As we have seen previously the demand for agricultural products is limited to certain crops, mainly beans and maize. However, the production of maize requires purchased inputs. Thus, lack of capital combined with lack of marketing facilities may in many cases be more important constraints on increased production, than lack of available labour.

Capital

We have to distinguish between two different levels of capital scarcity in the survey villages. The first level is related to the adoption of the "new tecnological package" including purchased inputs. In Buyala as well as in Mwenesanso most villagers do not have enough money to buy these inputs and it seems quite unlikely that such start capital can be generated within the existing subsistence-oriented farming systems. The peasants who have started permanent cash-cropping without VAP subsidies have earned this capital largely as migrant workers.

The peasants of Chitula Mayuni received subsidized fertilizer and seeds, and transport from VAP for the 1981/82 season. In addition they received advice on cultivation methods for hybrid maize. It was emphasized that the subsidized fertilizer was primarily intended for hybrid maize, although some households applied for and received

fertilizer for beans and finger millet. In order to receive fertilizer and seed, the peasants had to make an application and clear a "permanent field" of 0.25 - 0.5. ha.

The VAP subsidy and encouragement of maize production led to a substantial increase in the total maize hectarage of the village, from 2.0 hectares in the 1980/81 season to 7.2 hectares in the 1981/82 season. If the labour supply was already stretched to its limit, we would expect this increase in maize hectarage to be accompanied by decreases in labour input on other crops. Maize can to some extent replace finger millet as the staple. Households only producing for own consumption could therefore be expected to decrease the size of their chitemene to take up maize cultivation. However, there is a time element involved: The peasants did not receive the seed and fertilizer before the beginning of the rains. Prior to this they had no security that they would receive the subsidy. It would therefore be risky not to cut a big enough chitemene. VAP could go back on the promise of subsidized inputs. Moreover, chitemene and maize cultivation do not compete with regard to labour peaks.

Two cases were registered of peasants who had cut chitemene in 1980/81, but did not cut in the 1981/82 season,

when they started cultivating hybrid maize. For the other households the chitemene-size was constant or slightly increased.

A more likely result of increased maize hectarage, however, would be a decrease in beans hectarage. In Chitula Mayuni beans is traditionally the major cash crop, but receiving free inputs obviously improved the relative profitability of maize cultivation. Peasants elsewhere have been found to respond to relative price changes for cash crops, but are reluctant to experiment or take risks in their subsistence crop production. (Hunt, 1979: 252).

Since maize weeding coincide with the most labour intensive period in beans cultivation (ridging and planting) one could expect beans production to decrease when maize production increase. In Chitula Mayuni only three households reported to have decreased their beans areas in order to cultivate maize, while five households said they had increased both their beans and maize areas. Said one informant: "We make ridges for beans in the morning and weed the maize in the afternoon". If we suppose that the peasants' accounts of the size of cultivated area are accurate, the example from Chitula Mayuni indicate that, at least in this village, there were underemployed labour force which was mobilized when inputs and marketing facilities were available. It remains to be seen whether

this is a temporary phenomenon.

There is, however, a second level of capital scarcity related to technological change illustrated by the case of a peasant from Mwenesanso. During the 1980/81 season he cultivated 3.8 ha of maize, beans, millet and groundnuts. He had started with 0.5 ha of maize and expanded little by little to 2 ha. He works with his wife and three children. He had reached the limit for expansion, given the existing hoe technology and the available family labour force, and he was quité conscious about that. Without increasing drastically the use of hired labour (which was not available in the village) or introducing a more labour saving technology, he could not expand his cultivated area. He wanted to buy oxen but did not have money for such an investment. He had therefore applied for a loan, but his application had not been granted.

A general expansion of cultivated area cannot be based on the use of hired labour. Even when seasonal labour is used it is based on the exploitation of the worst off, e.i. people who are so poor that they cannot afford to wait until the next harvest in order to obtain the fruits of their own work. They are often forced to work for others in order to cover their cash needs.

In a situation where there is no real shortage of land

the supply of rural wage workers will not exceed certain restricted limits.

Given the actual hoe technology in most Bemba villages, which requires high labour input per cultivated area, access to labour is constraining the general expansion of farming area beyond certain limits without a change in the mechanical technology, which imply use of oxen or tractor for ploughing. Such tecnology change represents capital expenditures, far beyond the reach of most peasants in the area. No households in the survey villages used oxen for ploughing. There are for various reasons no cattle traditions among the Bemba. The introduction of oxen would therefore not only mean capital expenditures, but also the aquirement of new skills necessary in order to rear and feed the animals as well as to use them for ploughing.

Market conditions

We have earlier emphasised the importance of markets for increased production above the mere subsistence level. We will now give a more detailed picture of the market situation in the survey villages.

NCU is responsible for all agricultural marketing in the Northern Province. NCU's responsibilities include pur-

chases of most crops and sales of inputs to the producers. However, it deals mainly with maize. Some 80% of total amount of bags purchased in 1980 was maize, while the rest consisted mainly of mixed beans and paddy rice. NCU collects products from about 1000 collecting points, including 450 depots from which inputs are sold (Gerhardson, pers.mess., 1980). All the survey villages except Buyala had collecting points, while only Chisanga and Shikashimba had depots.

Most interviewed peasants were far from satisfied with the performance of the marketing agency. The reasons given were the following:

- They bring fertilizer too late
- They bring too little fertilizer
- They collect the produce too late
- They pay too late
- They pay too low prices.

Deliveries and payments

The peasants are recommended to apply basal dressing fertilizer on maize in November to early December. This is not always possible due to late delivery to the depots. Dates of delivery to Muntumo Farm Depot (serves Shikashimba and Buyala) during the 1980-82

period varied between: early January and mid February. During this period, producers buying their inputs from this depot have not been able to apply fertilizer in time. The situation in Chitoshi was better. During the last two seasons VAP has participated in distributing fertilizer from the district centres in Luwingu and Mporokoso to the Chitoshi depot, thus preventing the delay experienced by other NCU-depots in the area.

A related problem is late payment from NCU. The fertilizer has to be paid in cash, while NCU give the peasants a dispatch note upon delivery of the products. In the worst cases, the peasants have to wait more than six months to get their payment. Payments from NCU may therefore come later than the already delayed deliveries of fertilizer, and prevent maize-producers from continuing their production. In most cases they do not have alternative sources of cash incomes to cover the cost of inputs. This was the case of Mwenesanso. The village was selected for VAP support during the 1977/78 agricultural season. Due to late payment from NCU combined with lack of other cash incomes, most peasants could not buy seeds and fertilizers the following season. In this particular case the result would probably have been largely the same even if NCU had paid in time. Without help from the VAP tractor, which the following season was used in other selected villages, the transport

situation was deteriorated. The NCU-depot is located in Chisanga, about 6 km from Mwenesanso. The peasants have to provide transport themselves carrying either on bicycle or on their heads. It is obvious that neither of these means of transport are adequate if one wants to promote increased maize production.

The psychological effect on the peasant of not receiving payment in cash on delivery should not be underestimated. They are afraid of not being paid at all when they only receive a dispatch note upon delivery. An incident at the Chitoshi Depot illustrates this; During the 80/81 season 5 bags of maize disappeared from Chitoshi Depot before the maize had been collected by the NCU-trucks from Mporokoso. This led to an argument between the District Manager and the producers about who should cover the loss of the five bags, NCU or the producers. The producers had received dispatch notes, so NCU was the legal owner of the maize and should cover the loss according to the society's regulations. The result of the argument was, however, that the producers were not paid before January 1st 1982 and their payment was reduced to cover the loss of the 5 bags! Such incidents obviously do not encourage the peasants to increase their sales to NCU.

Prices

Dependency of official marketing services in remote areas also include dependency on official prices. We found that these prices distinctly favours maize production. Local prices on other crops than maize were much higher than the official prices for the same crops. The difference was most marked in Chitoshi area. By selling their beans directly in the Copperbelt, the peasants could get more than twice the price paid by NCU. Their location in relation to private markets gives Chitoshi peasants certain advantages compared to producers in more remote places.

Based on the data from the 1982 study and second hand data on labour input vs. local and official prices we made rough "profitability" calculations of Kwacha/ labour hours - return for various crops[1]. Maize was the most profitable crop, except in Chitoshi area where the unofficial prices for beans made this crop more "profitable" than maize.

Prices of inputs is another major factor influencing the relative profitability of crops. When VAP offered free seeds and fertilizer to the Chitula Mayuni peasants, there was an immediate increase in number of maize cultivators and cultivated area of maize. This indicates that

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1) For more details; see Vedeld & Øygard, 1983, pp 127-130

costs of inputs and difficult access to them prevent peasants from starting maize production. VAP support can therefore be seen only as a means to overcome the first level of capital scarcity referred to earlier. Continued maize production will, however, depend on the capacity of generating enough surplus to reinitiate a new production cycle based on the same purchased inputs, once the VAP support stops. During the 1981/82 season the cash expenditures per hectare of maize required seven bags per hectare to break even, while the corresponding produce of beans had to be four tins to cover seed inputs. The low "profitability" of groundnuts and finger millet may explain the limited sales of these crops: Maize and beans are more "profitable" cash crops. In spite of the low prices, most peasants produce finger millet and groundnuts for own consumption, including millet for brewing beer. The production of these crops is determined by other factors than prices, e.g. food habits, preferences, agricultural experiences and skills. Such factors seem to be less important in cash-crop production. Once the subsistence needs are met, the peasants seem to allocate an eventual surplus of labour to those activities where it earns the highest return. The evaluation of returns from alternative activities is not only based on narrow monetary considerations. It also includes an estimation of drudgery, risk and uncertainty inherent in each alternative.

Intervillage differences in market integration

We have previously discussed how differences in access to resources (labour and capital) at the household level produce variations in production strategies and crop patterns between households. We will now look at the market and transport situation of the villages comparatively in order to reveal impact of these factors on cash-cropping strategies.

Mwenesanso

We have already referred to the situation in this village. 81 per cent of the maize sold is produced by two households, which have a special agreement with VAP for transport of fertilizer.

The others have to rely on rather precarious means of transport which do not encourage maize production. 23 households sold smaller quantities of beans. During the 1979/80 agricultural season when NCU paid K 63 per bag, 72 per cent of the beans were sold to NCU. When the price was reduced the following season, beans production was relatively high, but the peasants were very disappointed and claimed that it did not make sense to continue production with the existing prices. Due to long distances from private markets of beans, private trading was not seen as an attractive alternative to NCU. We do not know where the Mwenesanso peasants actually sold

their beans that season. Neither do we know if the changes in the price of beans paid by NCU led to decreased production the following season. What we know, however, is that none of the 85 beans-producing households surveyed in 1982 sold beans to NCU. In Mwenesanso we did not register the amount of incomes from activities other than agriculture. Our impression is that they are rather limited.

Buyala

The transport situation in Buyala is even worse than in Mwenesanso, since the village cannot be reached by any kind of vehicle. All transport of goods to the main road has to be done on bicycle or on head. It is therefore not surprising that the general cash income level is low. Incomes from agriculture constitute about eleven per cent of the total cash incomes of the village. Most people we talked to in the Buyala did not consider it worthwhile to produce, for instance, maize to earn an income. They would have to carry each bag (90 kg) to the nearest depot; a 2 hours walk from the village. During the 1980/81 season only one household found it worthwhile to make this effort in order to sell two bags of maize. Agriculture (mainly sales of groundnuts and beans) is the main source of cash income in only one third of the Buyala households. The remaining households preferred to allocate their surplus labour in other small scale economic activities like sales of caterpillars and

mushrooms collected in the bush, sales of fish, handicrafts or in occasional piece-work in the surrounding area.

We assume that the existing transport situation in Buyala makes cash-crop production less attractive than alternative ways of obtaining cash incomes. It is necessary to emphasize, however, that the alternative ways are not very profitable either, since the general level of cash income is the lowest found in the whole sample.

Shikashimba

The transport and market situation in Shikashimba is much better than in Mwenesanso and Buyala. The village is located by the Kasama- Kayambi road and near to NCU-depot. Moreover the village has been supported by VAP. According to our informants, VAP-support has not led to marked increase in the number of maize producers. Thanks to savings from labour migration, maize production with use of fertilizer had been introduced even before VAP entered the village. If this information is correct we can assure that the VAP support has consolidated maize production among certain producers. This is reflected in the income level of this village. The general income level is higher in Shikashimba than in the other villages and so are the cash incomes from agriculture. 23 households (out of 28) produced maize, while 16 households

sold maize produced during the 1980/81 season. The difference between the number of producers and sellers of maize may be explained by the existence of a hammer-mill, which encourage people to produce maize for own consumption. The 16 households producing maize for sale obtained 72 per cent of the total incomes from agriculture in the village. Nine of them regularly used short-term loans from AFC.

This indicates that VAP support which certainly increase the number of maize producers during one season, does not necessarily lead to sustained maize production by all households.

In spite of maize being the most "profitable" crop in this village, many households do not produce maize for sale. They produce beans for sale or they do not produce cash-crops at all. These differences in production strategies cannot be explained by e.g. the unreliability of the market, since the market situation is similar for all households. They have to be explained by other factors discussed previously; lack of capital or labour. Differences between households regarding availability of capital, make some household more vulnerable to unreliable market services (e.g. late payment) than others. Therefore, a number of households have not been able to keep up maize production. Furthermore, some households

have an unfavourable ratio between producers and consumers, which prevents them from producing beyond the mere subsistence level, or they have cash incomes from other sources than agriculture.

It should also be noticed that Shikashimba, being the most market-integrated village of our sample, at the same time is the only village where all the households cut chitemene. This shows that market integration does not put an end to chitemene cultivation. Millet continue to be the staple and 80% of the households produce this crop in their fitemene gardens. This indicates that if one wants to abolish chitemene cultivation and at the same time take into consideration people's food (and drink) preferences, attention should be given to subsistence crops grown under permanent conditions. This problem will be discussed in more general terms in Chapter VI.

Regarding the aspects under discussion, Chisanga resembles Shikashimba and will therefore not be discussed separately.

Chitula Mayuni

The cash income level in Chitula Mayuni lies between those of Shikashimba and the other villages. The same is the case of the proportional importance of cash

incomes from agriculture. Only one household sold maize to NCU during the 1980/81 season; beans was the main cash crop. Most of the beans were sold directly or indirectly (through middlemen) in the Copperbelt. The prices paid to the producers were about K 105 and K 75 respectively. The corresponding NCU price was K 45. Due to the particular market situation of Chitula Mayuni, beans were certainly more profitable than any other crop. This is also true when beans are compared with maize. It will therefore be very interesting to see the long-term consequences of VAP-support. If maize production continues without VAP-support, it means more intensive use of labour and more diversified production, which in turn reduces the risk of total loss of crop. Since maize cultivation in this particular case is less profitable than beans and involves risk of loss of capital (not only risk of labour as in beans production), maize production may as well be a temporary phenomenon, which will disappear the next season when the peasants have to buy their own seeds and fertilizers.

We have argued that the peasants give first priority to subsistence production. Once the subsistence needs are met, they will allocate the evntueal surplus labour to those activities which give the highest return. We have now seen that the strategies adopted varies from one village

to another according to differences in means of communication and access to marketing facilities. When the transport situation is like that of Buyala, one cannot expect increased cash crop production in agriculture. People obtain their meagre incomes from other sources, like fishing and gathering. If the transport situation is improved and the market services extended to Buyala, one may expect an increase in cash-crop production from agriculture. When the transport situation is somewhat better, like in Mwenesanso, the peasants produce beans for sale. They do not need purchased inputs and when selling to NCU, the products are collected in the village. Wen NCU reduced the price of beans, a new situation appeared. It is probable that more Mwenesanso peasants will find it "profitable" to seek private markets after considering the additional cost of transport and drudgery of labour.

This is clearly the case in Chitula Mayuni, where beans production for private markets is the most important source of cash income. With the support from VAP, the peasants are given the opportunity to overcome the capital requirements necessary to initiate maize production. The relative "profitability" of beans and maize change, but beans is still the most "profitable" crop when sold on private markets. The future will show if VAP assistance is sufficient to incentivate sustained maize production in Chitula Mayuni.

Shikashimba and Chisanga have the most favourable market and transport situation, because of their location by the Kasama-Kayambi road and near to NCU-depots. Moreover, VAP gives assistance transporting maize to the depot and fertilizer to the peasants. Different from the other villages, maize production had been introduced in the area even before VAP-support was given.

This means that there existed certain local expertise in maize growing. In spite of the relatively favourable conditions for maize production found in these villages, not all households produce maize for sale. This reminds us that there are also other constraints influencing the production strategies of the households.

One objection to our reasoning about intervillage differences in market integration might be that the ecological conditions may significantly influence the relative profitability of the crops in the different villages. The rainfall pattern may for example be more suited for beans in Chitoshi than in Kayambi. It is difficult to estimate the effects of varying natural conditions, but they can certainly explain only a small part of the intervillage variations in market integration and choice of cash crops.

V. THE MAMBWE AREA

Two villages were studied in this area. Only the material from Mulenga village will be included. This village is located about 2 km south of Kaka Agricultural Camp in Mbala District, which is a small centre for the surrounding area, with extension services in agriculture and veterinary, primary school and health centre (see Map 2, page 21). The area around Kaka Camp is part of the Integrated Rural Development Programme (from now IRDP) and receives support for building wells and local roads, agricultural loans and free seeds and fertilizers for some crops like wheat and sunflower. IRDP does not give special support to maize cultivation, since the promotion of this crop is given high priority by others and maize production is widely practiced by the peasants already.

There are 25 peasant farms in Mulenga. 23 heads of households (all males) were interviewed, while two were absent during our visit to the village.

Land use and crop pattern

All the peasants in Mulenga are permanent cultivators, in the sense that each household has at its disposal a given area of land, allocated according to the rules of the tribal tenure system.1)

1) Gluckman discusses the criterias for defining tribal land tenure, according to him practiced in all African tribes (Gluckman, 1945). The land tenure system among the Mambwe is discussed by Watson (1958 p.p. 94-112).

The cultivation of this area of land follows a rotation system with regular changes of crops, succeeded by fallow periods.[1)]

The staple crops grown are finger millet and cassava, mainly produced for own consumption, beans which is produced partly for consumption, partly for sale, and maize mainly produced for sale. Hammermills are available in Kaka Camp, and maize plays an important role in the diet after finger millet and cassava.

Finger millet is planted on flat land from December to the first week of January. If millet is sown on new or fallow land, they start preparing the field, winterploughing in March, using hoe or oxen. They incorporate the organic material growing on the field, and leave it until December when they repeat the ploughing/hoeing before sowing. If the millet is sown on "old land", the fields are prepared in November. The millet is broadcasted on the field and the seeds are covered by soil, using big branches drawn over the field by oxen or by hand, if oxen are not available. The millet is weeded once in late February and harvest starts in June. Ploughing with oxen is exclusively done by men. If hoes are used, there is no defined sexual division of labour in millet production except during harvesting.
This is normally done by women, in the same way as in the

1) For more detailed agronomic information, see Trapnell, 1953, Mansfield, 1973 and Schultz, 1976.

Bemba area and is equally labour intensive here. In the Mambwe area the millet is threshed before storing, as opposed to the practice in the Bemba villages, where the millet heads are stored and threshing is done little by little throughout the year.

Cassava is usually planted in the beginning of the rainy season. Cuttings are taken from older cassava plants and planted on mounds prepared for that purpose. When the planting is finished, no cultivation activities are performed until the cassava roots are ready for eating, after about two years. The harvest takes place, little by little, throughout the third and in som cases the fourth year, according to the consumption needs of the household. Once harvested, the roots can be stored only for a couple of days. Many farmers, however, have the remaining cassava roots in the field up to 6 years, as a "security fund" against failure of the other staple crops. Normally these old cassava roots are not eaten because they are considered to be of inferior quality. Each household prepares a new cassava field every year. Cassava is a labour extensive crop without peaks of labour, due to the special harvesting conditions, and the yields are usually good even on soils with a low pH value. The roots are rather poor in proteins but the opposite is the case of the cassava leaves, which are used for relish. Except when oxen are used, there is no strict sexual labour division in cassava growing.

Beans are the most important source of protein and the ingredient most frequently used for relish. Beans are normally planted twice a year. The first planting starts from the beginning of December. The early beans are planted on grass mounds and are ready for harvesting in late January. These beans are normally used for internal consumption. When the harvest is finished, the grass-mounds are flattened and a second planting is done on flat land in February. The peasants do not seem to bother much about plant distance as they practice a sort of broad-casting, using branches or a small hoe to cover the beans with soil. Late beans are ready for harvesting in April/May, but in many cases they are left in the field until the other crops are harvested. There is no strict sexual labour division in beans product.

Maize. The preparation of new fields starts in November, with ploughing, erradicating weeds and incorporating organic material into the soil. Then the fields are left for 2-3 weeks before being ploughed once more, and ridges made for planting. If maize is sown in an "old" maize field, the labour process is a bit different depending on the techno-logy used. If drought animals are used, the fields are ploughed and new ridges made. If hoes are used, however, the new ridges are made in the middle of the old ones, using the soil from the old ridges covering the weeds and grass growing in the middle. A planting stick is employed

to make holes where the seeds are placed. Eight of the maize producers used fertilizer during the 1980/81 agricultural season. A spot application of basal dressing is made, before the first weeding in the middle of January, when the plant has 2 - 3 leaves. A second application of fertilizer (top dressing) is made in late February, as well as a second weeding. A third weeding is recommended, but very few farmers go through with this.

The cobs are mature in early March and people usually cook or toast some of them for eating. The real harvest starts when the cobs are dry, approximately 2 - 3 months later. When the maize is harvested, it has not yet reached the necessary drying percentage, so maize bins are built near the houses where the cobs are stored for about another month. Some of the maize is shelled and stored for internal consumption, the rest is sold to NCU.

There are only two farmers producing wheat and three producing sunflower. They have received free seeds and fertilizer from IRDP. It was thought that wheat was a suitable crop to be grown in this area, because it is sown in early March and does not compete with the other crops as far as the sowing period is concerned.

Regarding harvest, however, wheat competes with the other crops. The wheat-growers in Mulenga said that the wheat was the last crop harvested. When the wheat is harvested

too late, much of the ears are broken, grains have fallen to the ground or are eaten by birds. According to the extension officers, delayed harvest is a general problem among the peasant wheat producers, and (with all its implications) probably the main explication for the low yields obtained. However, even when the wheat is harvested in time, harvesting is considered problematic because it has to be done by hand and is very time-consuming. Threshing is considered another big problem. It is done by pounding the wheat with sticks. The grains are thus spread on the ground and mixed with the ears and it is very time-consuming to sort them out. It would seem that this is not always done. The extension officers told that the threshing often ends up with the ears being burnt, including a lot of grains, which means that a considerable part of the crop is spoiled. All these problems are reflected in the yields. Wheat yields of the two Mulenga pasants were 1 bag (90 kg) per lima.[1)]

Experiences with sunflower have not been successful eighter. Compared to wheat this crop also competes with the traditional crops at the time of sowing. The sunflower yields in the area are generally low. The three Mulenga producers had 22.5, 45 and 90 kg pr. lima respectively.

The peasants do not seem to give much attention to crops that they do not consume themselves. This is the case of

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1) One lima equals one quarter of a hectare.

wheat as well as sunflower. The Mulenga peasants accepted the "experiment" because seeds and fertilizers were given free. The low yields did therefore not imply a loss in monetary terms. However, none of them wanted to repeat the"experiment".

Maize is a different cash crop. The cobs can be consumed before as well as after the main harvest, and the stems of the green maize are eaten "á la" suger cane.

Household composition and production

All heads of household in Mulenga are Mambwe and the settlement pattern is largely patrilocal.
The village contains 185 individuals, divided into 25 different households, which belong to five lineages, related through intermarriage. Out of the 23 households surveyed, twelve are nuclear families. The remaining households are extended families with a nuclear family core. Seven of them are polygamous men with two to three wives and children, which at the same time have one or more relatives attached to the household.

In the Bemba area we discussed the household composition in relation to chitemene cultivation, chitemene and permanent cultivation and permanent cultivation only. These are not relevant categories in Mulenga. We have seen that all producers are permanent cultivators. Subsistence as well

as cash crops are grown under similar conditions, except maize where the "new technological package" are used by some producers. There is, however, important differences between the households regarding size of cultivated area on one hand and how they allocate land and labour in the production process on the other. The smallest cultivated farm area is 0.8 ha, the biggest is 11 ha; while the village average is 4.2 ha.

Like in the Bemba villages, the peasants seem to give first priority to subsistence production. One can therefore expect to find that production of subsistence crops will increase proportionately with the number of consumers in the household. This is difficult to measure, however, since finger millet, to some extent maize and cassava, are used for consumption, and no household could account for the amount of cassava consumed, since cassava is harvested little by little and in "unknown" quantities.

Regarding millet, we found that the size of the cultivated area increased with the number of consumers in the household.

No. of consumers in the household	Size of the finger millet field (Lima)
1 - 3	3.5
4 - 6	5.0
7 - 9	6.5
10 or more	9.0

21 of the households in Mulenga defined millet as their staple food. It is produced exclusively for internal consumption either as nshima or beer.

Since the size of the cultivated area of subsistence crops is largely defined by the consumption needs of the household and the subsistence crops constitute the main part of the total crop pattern, we find a relationship between number of consumers in the household and the size of the total area cultivated. However, there is a variation among the households regarding the proportion of commercial crops as compared to subsistence crops which are not directly dependent on the size and composition of the household. There are other factors which determine this relationship.

The impact of capital and credit

If we look at the maize producers, we cannot use cultivated area as an indicator of potential output, because of the differences between households regarding access to technology, mainly hybrid seeds and cow manure or fertilizer. These inputs have dramatic consequences for the productivity per area unit. While the majority of the households produced maize during the 1979/80 agricultural season, only eight of them applied the recommended quantity of hybrid seeds and fertilizer on their maize fields.
Their yield per ha was 30.6 bags. Four households used

cow manure. They had an average yield of 23.8 bags per ha, while the 11 households which grew maize without applying neither manure nor fertilizer had en average yield of 5.6 bags per ha.

Compared to finger millet which is grown largely in the same way by all farmers, i.e. without use of new technology, capital is a very important factor determining the potential output of maize. Five out of eight farmers using fertilizer on maize during the 1979/80 season obtained AFC-loans to buy these inputs. The remaining three produce on small areas only: 1 or 2 lima. Four new farmers obtained AFC-loans for the 1980/81 agricultural season. They increased their yields of maize from an average of 4.9 bags/ha in 1979/80 to 44.5 bags/ha the following season, when the recommended seeds and fertilizer were applied. When AFC-loans are obtained, many farmers increase their cultivated areas of maize. At the same time maize production with use of fertilizer is more labour intensive. This indicates that capital, rather than labour is the major constraint in maize production. Since maize is mainly a commercial crop, an increase or decrease in maize production does not follow the changes in size and composition of the household, as we assume is the case with finger millet or other crops grown exclusively for subsistence.

The expansion of maize production in Mulenga is thus closely related to the availability of AFC-loans. The same occurs with the differentiation among the maize producers using hybrid seeds and fertilizer. As most borrowers expand their maize fields every year and the loans are increased correspondingly, those who first obtained AFC-loans are also the biggest maize producers in the village.

Different from the VAP subsidies which are given to all producers in the selected villages, on condition that they have prepared a certain area for cultivation, the AFC-loans are given to selected peasants only. The applicants are ranked by the extension officers according to certain criterias. They have to be worthy of credit before getting the loan.

Different from the Bemba villages, nearly one third of the peasants in Mulenga are cattle owners. We did not register any case, however, where cattle had been sold in order to buy agricultural inputs. When sales take place, it is often in cases of "crisis" or when the animals are old. Even if some of the younger men paid their bride-prices in money, cattle is still important as a means of marriage payment. Cattle can therefore not be considered as a mere commodity which can be used for commercial purposes. This will probably change gradually when cattle

becomes more important as a means of production which cannot only be aquired through inheritance and on payment of brideprice, but also with credits from CFC (Credit Agency for Cattle). Nearly all the Mulenga peasants have been labour migrants for shorter or longer periods. Except in one case, the money saved was not invested in agriculture. It was normally used for paying brideprice or buying clothes and other consumer goods for the labour migrant himself and his relatives.

Some implications of kinship

In Mulenga labour does not seem to be as much of a limiting factor in agriculture as it might be in the Bemba villages. This is related to differences in technology combined with differences in forms of cooperation. Mulenga is a village with long traditions in cattle holding. While only six of the Mulenga peasants are owners of drought animals, 19 households used oxen for ploughing, at least some of their fields. This respresent an important labour saving factor. Most of the non-owners borrow the oxen used. We have to look at the kinship system to explain this.

As we mentioned, Mulenga has a patrilocal settlement pattern. All heads of households, except four, are related to one of the five lineages in the village; as fathers, sons or brothers. The remaining four are re-

lated through marriage with sisters or daughters of heads of households belonging to the mentioned lineages. The relatives live near to each other and farm on the fields allocated for the members of each lineage. When a man marries to a woman from Mulenga, or another village, she moves to his home, normally next to his father's or brother's house. In this way, male heads of households are both neighbours and kinsmen. They are also heirs to each others property, and thus, at least potentially, interested in the prosperity and well-being of each other. We will give an example to show how the use of oxen is influenced by kinship ties:

Johnathan, Chales and Teza are brothers. When their father Samson died they inherited among other things one pair of oxen. They use the oxen for ploughing their own fields. Their draught animals are also used for ploughing the fields of their classificatory brother Mathews, who lives nearby them. Their father had two wives. The mother of the three brothers was his first wife. When the father died, the widows became the responsibility of the oldest brother Johnathan. After some time, however, the second wife's brother became mentally ill. He thought that he had been bewitched by his kinsmen in his own village and decided to move to Mulenga where his sister lived. He built his house next to Johnathan's and has taken over responsibility of his widowed sister. He uses the oxen of the brothers for ploughing.

Johnathan and Chales are married to daughters of Musakele. He is an old man without oxen. Johnathan and Chales help him to hoe his fields. When we asked them why they did not use their draught animals, they answered that the working capacity of the oxen was exploited to its maximum. "If we are able to buy another pair of oxen we will, of course, plough Musakele's field, but until then we will have to contribute with our hoes." Due to the kinship ties linking the village members, the oxen are circulating and in this way fully utilized.

13 households said that help from relatives was important for their agricultural production. The kin categories registered were the following: brother (14), son (4), father (4), mother (4), son-in-law (2), brother-in-law (1) and sister (1). From this list we see that patrilineal kinsmen are those who most frequently help each other with agricultural activities. The relatives participate in all kind of farming activities from clearing of land to threshing of finger millet, or maize shelling. The list above only include cooperation referred to as "help". In addition to this, relatives also participate when ukutumya is organized.

Ukutumya

Nearly all the households in Mulenga brewed beer for work parties during the 1980/81 season. Only two

households did not. One had recently moved to the village and was about to initiate agricultural activities. No millet was available for brewing beer. The other consists of a newly married young man and his wife. They received help from the husband's parents and three brothers, and did not need additional labour force.

50 work-for-beer-parties were arranged in Mulenga during the 1980/81 season, comprising 708 man/days and 69 oxen/days distributed among 21 households. The number of work-for-beer-parties arranged per household varied from 1 to 6, with a village average of 2,4. The number of participants in each party varied between 9 and 26, when manual work was done, and between 2 men + 2 pairs of oxen and 7 men + 7 pairs of oxen, when ploughing was done.

Nearly all households mobilizing people with draught animals when ukutumya was arranged, were thenselves owners of oxen, or sons of owners, with access to their fathers' animals. Instead of ploughing individually they made it a collective undertaking. "Today my field, tomorrow yours", as one informant put it. Only in one case such a reciprocal relationship did not exist. This household had previously hired two neighbours and their oxen to plough a maize field. When this household arranged

ukutumya to plough a millet field the same neighbours participated.

We have seen that the number of work-for-beer-parties is not equally distributed between the households. While the majority organized one or two, eight peasants organized three to six times. They are polygamists which in this context means rather well off, or the husband is unable to work because of illness or old age (two cases). Justin was the one organizing ukutumya six times. His household is composed by three wives, eleven children, his widowed sister and her six children. He is the biggest maize producer in Mulenga (5 ha) and together with the headman, the biggest millet producer. Each wife has a separate millet field (1 ha each), but they work together. After harvesting, the millet is divided between the wives. They store it separately and each wife provides millet for organizing two beer-parties. Justin own one pair of oxen which he used on his own fields only. He mobilized additional labour for harvesting finger millet and maize. The headman organized ukutumya five times. He lives with his two wives, five children and two "mothers" (his father's widows). He also own work oxen and organized ukutumya in order to plough his fields of maize, millet and beans.

The above presentation shows that the level of cooperation

between kinsmen and neighbours is much higher in Mulenga than in the Bemba villages, where we registered relatively few cases of "help" from kinsmen. Such help was mainly given in emergency situations.

Compared to the 708 man/days and 69 oxen/days mobilized for ukutumya in Mulenga during the 1980/81 season, the corresponding numbers in the Bemba villages were much lower. In Chitula Mayuni (32 households), Shikashimba (28 households) and Buyala (37 households), we registered 233, 221 and 200 man/days respectively. No draught animals were used. We think that the explanation is to be found primarily in the differences in kinship systems and "rules" of residence and inheritance.

Hired labour

Regarding use of hired labour, the differences between Mulenga and the Bemba villages are not so big. Nine households employed 316 man/days. The number of man/days used varied from 16 to 75. All the hired labour was used in maize production. Two cases were of the emergency type found in the Bemba villages. The heads of households were ill. They produced maize without fertilizer, which in one case was consumed. The other consumed part of the maize and sold the rest. The others are rather well off, producing hybrid maize mainly for sale. Five of the polygamists are represented and Justin is the one who used most hired labour and very cheap labour. 25 persons

coming from Mulenga and nearby villages harvested his maize and finger millet. They used one and two weeks respectively. He paid them in kapenta (fish), which he had bought in Mpulungu with 60 Kw. This equals a day wage of 26 ngwe, or 37% of the day wages usually paid in the area.

The rural labourers are recruited locally or they come from Tanzania. Payment is given in money or kind and there is considerable variation in the amounts paid. Some labourers are paid by the day, normally 70 ngwe. Others are paid by tasks permformed, and the amount to be paid is agreed upon before the work starts. Still others are paid in kind. The wages paid to Tanzanians are generally lower than the wages paid to local people.

One Mulenga peasant employed three men from Tanzania, who worked for him one month preparing his maize field (1 ha) for planting. They were given accomodation and free food in his house and a cash payment of 5 Kw. each. This was considered a very low payment by some of his neighbour villagers, who were present during the interview. They called him an exploiter of the poor, certainly in joking terms, but the joke seemed to have an underlying seriousness.

We assume that the use of hired labour in Mulenga is mainly related to processes of agricultural expansion

and accumulation.

Polygamy and economic position

There are 7 polygamists in Mulenga, and as well as in Mwenesanso/Chisanga polygamy is related to economic position. The Mulenga polygamists are the most well-off in the village. As we mentioned previously, Mambwe people explain the existence of polygamy in terms of social prestige. In this way polygamy is an expression of economic wealth rather than a means to obtain it. Their perception is different from the view expressed in Mwenesanso/Chisanga, where people seemed to look at polygamy primarily as a source of additional labour force. This is partly related to cultural differences between the two tribes. We have seen that the long tradition of cattle holding, the implicants of the patrilineal kinship system among the Mambwe etc. create conditions where labour does not seem to be as much of a limiting factor as it might be in the Bemba villages. Moreover, the use of oxen in Mulenga has resulted in a new sexual division of labour as compared to villages where hoe cultivation is predominant. When oxen are introduced, women are "excluded" from an important part of the agricultural work, and female labour becomes less crucial in the production process. This means that the differences between Mambwe and Bemba in the way they look at polygamy also reflects differences in their

general economic situation.

Market conditions

In Mulenga maize is the most important crop as far as quantities sold and incomes are concerned. 14 households sold maize to NCU during the 1980/81 season. The quantities sold varied between two tins and 94 bags, mainly determined by the technology used and the size of the cultivated area. 15 households sold rather small quantities of beans, varying from one to twelve tins. About 53 percent of the beans were sold to NCU, 27 per cent to merchants and the rest to the local consumers. Sales of other products were limited. Seven tins of millet were sold locally, two bagsof wheat and three and a half bags of sunflower were sold to NCU.

Compared to the Bemba villages the extension service seems to function quite well, may be primarily because of the personal qualifications and enthusiasm shown by the Agricultural Assistant.

The services related to the collection and payment of products are also carried out in a satisfactory way. Marketing problems are mainly related to the distribution of agricultural inputs. The NCU-depot is located about 5 km from the village. The road is good, but the farmers lack means of transport. One peasant (Justin) had brought a schotch-cart with credit from IRDP. The

1) One tin equals 15 kg.

headman used a hollowed trunk drawn by oxen, being in this way able to bring two or three bags of fertilizer in one trip. Some other producers also used his means of transport. The others used bicycles or carried the bags on their back. This shows that improvement in the transport system is of crucial importance for the further development of commercial cropping in the village.

VI MAIN CONSTRAINTS AFFECTING POSSIBLE CHANGES IN THE PRODUCTION SYSTEMS.

Subsistence versus cash-cropping

From our findings it is clear that all production systems analysed are based on a combination of subsistence and cash-cropping. The producers allocate time and resources in such a manner that they secure both subsistence and cash needs, but in situations where this is not possible, the fulfillment of subsistence needs is given first priority. We will therefore emphasise the necessity of considering the relationship between both types of farming when changes are planned. In other words, if one wishes to increase cash production, this must be related to improvement in subsistence production. Producers in the Northern Province can produce more and sell more, but at the same time they must reproduce themselves: production for sale is an aspect of the overall production. Therefore,

it is easier to introduce maize than sunflower, because having more money does not imply that this money must be used for buying foodstuffs.

To think only in terms of production for the urban market to solve the problem of productivity is no real solution. Extension of cash crops can, in theory, enter into conflict with subsistence aims. It is therefore necessary also to think in terms of local needs and potentials. The case of maize is a very clear example of the fact that extension of market transactions is not divorced from the fulfillment of subsistence goals. Regarding beans, this is even more so. For other crops, like finger millet and cassava, this is not the case. These crops circulate mainly in the subsistence spheres. This could possibly change if market conditions and local processing of cassava were improved.

The case of millet needs a further consideration. Even if millet is used as a "cash crop" in beer production, it is only sold in the village. Therefore the beer-market is a special market which to some extent resembles a "credit system". The production of beer can continue only if the peasants are sellers at particular moments and buyers at others. This implies that money for beer must circulate all the time and that, for this reason, only small amounts of money can be taken from the market

for short periods. Therefore, methaphorically,we can talk of a credit system and it is impossible to consider the amount of money gained after selling beer as net income. This does not necessarily mean that all households produce the same as they consume. Small "income" differences from beer sales can be observed.

If we accept that the peasants are mainly subsistence producers, it must be recognized as a logical consequence that, at least theoretically, to increase subsistence production implies a substraction of labour force, time and resources from cash production. (This is clearly seen when we compare households where the ratio between producers and consumers is low with households where the corresponding ratio is high). Consequently any increase in subsistence productivity would liberate labour force, time and resources for cash production. Therefore, instead of looking to cash cropping as the only solution, it seems more realistic and appropriate to look at subsistence farming as the key element. There is not necessarily any contradiction between these viewpoints. The case of beans is one example where increased productivity would mean more food for less work and at the same time more labour available for cash production. An increase in the productivity of sunflower would not have the same effect. The peasants producing sunflower will have to use the same time as before to secure subsistence

needs. Only if they have spare time they will produce sunflower. The impact of increased productivity of such crops are therefore more limited. The case of maize is similar to beans only if hammermills are available. Otherwise maize is more similar to sunflower, even if small quantities of green cobs are consumed.

As our report shows, cattle holding and use is a widespread activity in Mambwe area. However, livestock must be analysed in terms of the same logic of subsistence/cash combination which we have used, when discussing agricultural production. Obviously, cattle holding is intimately related to agricultural production: Mambwe are primarily agricultural producers. Above all, livestock is an asset which per definition is multifunctional. The possession of cattle is an indication of prestige; a guarantee against misfortunes; a possible fund for the sons when they wish to marry; a part of inheritance; both for sons and brothers; and, of course, it is important as a means of production. Therefore, livestock is not managed with clear commercial aims. An observer is given the impression that the reproduction of cattle is not planned, but is almost a product of "natural accidents". Of course, cattle represent money, especially since a local and regional market exists and prices have increased rapidly

the last few years. Nevertheless, livestock is for the most part defined in relation to the purposes mentioned above and rarely in relation to the possibilities for accumulation of money.

There is, however, a possibility of introducing some changes in the management of livestock production, but these must be related to increasing the potentiality, existing in this important resource, for getting a better diet and for improving the production of means of traction and manure. The possibilities of introducing changes which will result in the raising of cattle for profit seems to us, at this stage, very unrealistic and in deep conflict with the existing cultural values.

Labour

Our findings indicate that agricultural production is mainly based on the use of household labour. The household size and composition regarding sex and age of the household members play a central role in the allocation of resources. This is most evident regarding subsistence production. The production of subsistence crops increase proportionately with the number of consumers in the household. The production of cash crops is closely related to the labour capacity of the household, but the amount produced is not determined by the food requirements of its members.

Whether cash crops are produced at all, what crops and how much, will also depend on other factors, e.g. capital and market facilities. Moreover, the use of hired labour is more frequently found among "big" cash-crop producers.

We have seen that kinship may play an important role in the allocation of resources. In the Bemba villages cooperation seems to be stronger among women than among men, while the contrary seems to be the case in Mulenga. Our findings indicate that the level of cooperation in agriculture is generally higher among the Mambwe than among the Bemba. We have argued that this is related to differences in kinship system. Matrilineality and patrilineality are associated with differences in systems of cooperation, formation of local groups and circulation of goods and services. We pointed out that the patrilineal system seems more compatible than the matrilineal with individual expansion and accumulation.

Therefore, if the logic of this analysis is accepted, the tendency of defining peasants as individual producers all having the same social characteristics can be wrong. We can illustrate this statement with respect to credit policies. When a farmer in the Mambwe area receives credit, all his brothers indirectly receive credit at the same time because all of them have

rights in the results of the farming activities, if not in short-term at least in the long run. The same observation can be made in relation to credit given to individual producers without taking into consideration the household composition. Without a closer examination of these dimensions, an injustice can be introduced in the credit system. To take into account household composition and kinship is relevant, especially when credit availability is scarce.

Access to capital and marketing facilities

As the comparative analysis of the Bemba villages shows, the mere existence of roads and certain minimal transport facilities is a first step towards increased agricultural production for sale. This is the case of beans production, where no purchased inputs are used.

Regarding the expansion of maize production, capital is a crucial factor. Capital have primarily been provided by VAP-subsidies and AFC-loans. The capital thus provided can only play a positive role if it is accompanied by some other measures. The lack of cash for buying seeds and fertilizers is an important bottleneck in the Northern Province. But to give more credit to maize production is in itself not a panacea. It is not sufficient to give credit alone; at the same time

it is necessary to guarantee that the producers will receive the inputs which cash can buy in time. In this respect, if the extension of subsidies and credits result in more maize being produced, the initiation of the production activities the next year depends on the payment for produce in time. For farmers entering the maize production system for the first time, as the experience in Mwenesanso dramatically shows, marketing possibilities for crops are as crucial as the availability of seeds and fertilizers.

A second level of capital shortage is related to the use of more labour intensive technology. This is not yet a major problem in the Bemba villages, where the capital shortages is mainly related to the aquirement of purchased inputs. Considering the labour situation, however, an overall expansion of the cultivated area beyond certain limits is unthinkable without a change in the mechanical technology.

As the analysis of Mulenga indicates, the control of livestock can be a factor introducing social differentiation at the village level. Another problem arises when the relationship between the number of available oxen and the area to be ploughed is such that ploughing cannot always be done at the right time. An extension of credit for buying cattle can have a positive and

immediate effect in many villages. It is possible to imagine forms of credit which take into account the forms of cooperation existing in the area (among brothers as well as among fathers and sons).

Introduction of oxen for ploughing in the Bemba area is a more complex undertaking, since cattle raising is next to non-existent. People would have to learn how to rear and feed the animals and how to use them for ploughing. The situation of permanent cultivators in Mulenga is totally different from the problems faced by a chitemene cultivator in the Bemba villages. This should be reflected in the credit policy. The actual credit policy is planned in relation to producers who have already began production for cash. In this way it is not difficult to imagine that to increase the amount of credit for buying cattle in Mambwe area will result in a rapid response in terms of productivity. Credit is a part of the logic of reproduction of such a system. Chitemene, on the contrary, is still a very compact production system and very adapted to the prevailing conditions in many parts of the high rainfall areas in Zambia. To change chitemene implies changing a system and not only some small details which hinder that resources are exploited to the maximum. Our impression is precisely that chitemene functions at a maximum once its inner logic is accepted. This could explain the

difficulties experienced in introducing changes in the areas where it is still a dominant form of production. In this respect, both the credit and the marketing policies must be adapted to the different production systems. This could imply in the short run that a hierarchy can be introduced in which the main objectives of the credit and marketing changes are to change the nature of chitemene production.

Changes in the market situation should also include improved provision of consumer goods to the countryside. The short supply of practically all consumer goods does not motivate the peasants to increase their cash crops.

To find solutions to these problems should be one important goal of SPRP.

VII SUGGESTIONS FOR FURTHER RESEARCH

The main task of the socio-economic part of SPRP during Phase I has been to reveal socio-economic constraints affecting possible changes in the production systems in the Northern Province. The next step should be to find solutions so that the peasants can be able to overcome these constraints. We will now suggest some areas for further research.

Land

In our report we have mainly delt with land use and crop patterns. We have seen that the peasants give first priority to production for own consumption and that the production of cash crops is related to the production of subsistence crops. We will, therefore, suggest that efforts should be made in order to investigate the possibilities to increase the productivity of subsistence crops like millet, beans and groundnuts when these crops are grown under permanent conditions. Increased productivity of subsistence crops will favour all peasants, while increased productivity of cash crops only favour those who have surplus labour and other resources necessary in order to produce for sale. Broadly speaking, land is currently not a scarce resource in Northern Zambia. A change to permanent cultivation will, however, lead to changes

in the use of land, which in its turn may lead to changes in the actual land tenure system. The land tenure system should therefore be investigated.

Labour and technology

Our findings indicate that in households with favourable ratios between producers and consumers, labour is used more efficiently when capital and market constraints are improved. An increase in cultivated areas beyond certain restricted limits, however, seems impossible without use of hired labour or a change in the mechanical technology. At the moment the use of hired labour is to a large extent based on exploitation of the poorest households. The supply of wage labourers is therefore rather limited. As long as there is no shortage of land, this supply is not likely to increase. Increase in cultivated area based on the use of hired labour is therefore neither desirable nor realistic. The question of technological change should therefore be investigated. Among cattle-holding people like the Mambwe, the expansion of ox-ploughing is mainly a question of availability of credit. Among the Bemba, where no cattle traditions are found, the introduction of oxen is a complex undertaking. It is relevant to ask whether introduction of oxen is possible at all.

The relative advantage of various types of technology is an area of investigation which is urgently needed. It should not only deal with the question raised above. It should consider all labour processes in the existing production systems, and give special emphasis to those related to permanent cropping. This research should also include non-agricultural activities e.g. processing of food, which is currently very time-consuming and take much of the households labour time, which otherwise, could be used on other activities, including agricultural production.

Capital

In subsistence economies with little surplus production, shortage of capital is a serious constraint preventing adoption of purchased factors of production.

One way of coping with this problem is to promote crops where such factors of production are not indispensible e.g. beans. Another solution is related to provision of subsidies and credits. Sources of subsidies and credits are also scarce. It is therefore important to investigate where these scarce capital resources can be put to its highest use.

This research should take into account variables like household composition and kinship, which according to

our findings are important in the process of resource allocation.

Market conditions

We have argued that to solve the capital problem is not a panacea. It is not sufficient to give credit alone as long as the market services do not work, and the producers have no guarantee that they e.g. will receive their inputs. This increases the risk factor and may prevent producers from market participation. How to improve the market conditions should therefore be another crucial field of research.

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APPENDIX I: Questionnaire applied in 1981 (Bemba Area).

Village:

Name of the farmer Age:

Educational level: Tribe:

Do you go to church? If yes,what church?

TO MALE HEAD OF HOUSEHOLDS

How many wifes do you have at the moment?

	Year of marriage	Brideprice Money	work	How many children do you have?	Age of your wife
1 wife					
2 wife					
3 wife					

Have you been married to other women than your actual wife/s?

If yes:

	Number of children	Where are the children now	Why are you not living with this wife/s any more?
1 wife			
2 wife			
3 wife			

TO FEMALE HEAD OF HOUSEHOLD

Are you: a)married: b) widow: c)deserted: d)divorced:

If married:

When did you marry: Number of children:

Is your husband living with you?

If not, how long have you been alone?

What is your husband doing?

Is he sending you money or some other kind of help?

Does your husband have more than one wife?

If yes, how many?

If deserted/divorced:

When did you marry? Number of children:

How long have you been alone?

Why are you not living with your husband any more?

Are you living with some relative?

If yes, with whom?

If widow:

When did you marry: Number of children;

When did your husband die?

Are you living with some relative?

If yes, with whom?

TO ALL INFORMANTS:

HOW MANY CHILDREN DO YOU HAVE? (For men: 1 wife)

Child	Sex		Age	Doing what				
	M	F		Local sch	Boarding s	Work away	Work home	Married
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

How many of your first wifes children died before the age of 5?

FOR MEN: 2nd wife

Child	Sex		Age	Doing what				
	M	F		Local sch	Boarding s	Work away	Work home	Married
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

How many of your 2nd wifes children died before the age of 5?

Are there other persons than your wife/husband and children living with you? If yes, who?

Are you born in this village?

If not, when did you move here?

Are your wife/husband born in the village?

If not, when did she move here?

If none of you are born in this village, why did you move here?

AGRICULTURE

CHITEMENE

Do you practice chitemene cultivation?

If yes, what kind of crops do you have in your fields?

	Kind of crops	Use of product
1st year		
2nd year		
3rd year		

Are your chitemene/fifwani fields so near the village that you can go there to work and come back to the village on the same day?

Do you live in mitanda parts of the year?

If yes, during what months?

Who is living with you in mitanda?

Did you sell some of the products grown in your chitemene/fifwani fields? If yes, what products?

Do you and your wife have:

a) joint fields: b) separate field: c) both:

If separate fields, what are you growing:

Husband:
1st wife:
2nd wife:

Why do you have separate fields?

SEMI OR PERMANENT FIELDS

Do you grow any crop/s on semi or permanent fields?

If yes, what kind of crop/s did you plant last season?

Kind of crop	Est. area	When did you plant last season	Use of fertilizer Yes	No	Use of product

When did you start to grow on semi or permanent fields?

Why did you start to grow on semi or permanent fields?

Did you need any extra money input?

If yes, how did you get that money?

Do you practice any crop roatetion in your permanent field/s?

If yes, how is the rotation system:

Kind of crop	Use of fertilizer	
	Quantity	Kind
1st year		
2nd year		
3rd year		
4th year		
5th year		

How many years do you think it is possible to grow in the same field?

Do you find available land for clearing new fields?

a) next to your actual field/s:
b) near to your actual field/s:
c) far from your actual field/s:
d) no available land:
e) other:

Have you expanded your permanent fields since you started permanent growing?

If yes, when? How much?

VILLAGE GARDEN

What are you growing in your village garden?

Cassava:
Sweet potatoes:
Maize:
Sugar cane:
Beans:
Tobacco:
Onions:
Tomatoes:
Pumpkin:
Others:

Bananas:
Mango:
Oranges:
Others:

Do you sell any of the product from your village garden?

If yes, what?

LIVESTOCK

Do you have any livestock?

	Number	Consumption	Sale	Sale for what purposes
Cattle				
Sheep				
Goats				
Hens				
Others				

MARKETING

Kind of product	NCU		Merchants		Local consumers	
	How much	Price	How much	Price	How much	Price

Do you some times buy consumer goods that you sell to your villagers?

If yes, what kind of goods?

Do you/your wife brew beer for sale?

Do you sometimes buy beer?

USE OF LABOUR

Who use to work on your/your wifes fields?

Did you use hired labour last season?

If yes, how many persons?

For what kind of work?

What kind of payment?

a) Money:
b) Kind:
c) Other:

Did you get labour help from your neighbours last season?
If yes, how many persons worked?
What kind of work?
What kind of payment?

a) Kind:
b) Labour (mutual help):
c) Cutumia:
d) Other:

Did you get any labour help from your relatives?
What relatives helped you?

What kind of work?

Did they get anything for helping you?
If yes, what?

WAGE WORK

Do any of your family members work outside the village at the moment?

If yes, who?
1.
2.
3.
4.

What kind of work?	Where?
1.	1.
2.	2.
3.	3.
4.	4.

Do they give you some economic help?
If yes, in what way?

Have you been working outside the village?

If yes

When	Where	What kind of work

Why did you come back to the village?

Do you receive any pension?

When you came back. did you bring any money?
If yes, do you remember how much?

FOOD PATTERN

What do you use for making nshima?

a) Most used:
b) 2nd most used:
c) 3rd most used:

Did you produce all you needed for nshima last year?
If not, why?

How did you get additional staple food?

What do you use for making relish?

Do you sometimes buy ingredients for making relish?
If yes, what?

Consumer durable goods owned by the household:

Bicycle: Radio: Watch:
Furniture: Others:

What kind of farm equipment do you own?

Kind of equipment	Number
Hoes	
Axes	
Others	

What would you like to buy if you had more money?

OBSERVATIONS:

APPENDIX II: Questionnaire applied in 1981 (Mambwe Area)

Village: Age:
Name of the farmer: Tribe:
Educational level:
Do you go to church? If yes, what church?

TO MALE HEAD OF HOUSEHOLD

How many wifes do you have at the moment?

	Year of marriage	Brideprice		Number of children	Age of wife
		Money	Cattle		
1 wife					
2 wifes					
3 wifes					

How did you get the money/cattle for the brideprice?

Have you been married to other women than your actual wife/s?

If yes:

	Number of children	Where are the children now	Why are you not living with this wife/s any more?
1 wife			
2 wifes			
3 wifes			

TO FEMALE HEAD OF HOUSEHOLD

Are you: a) married: b) widow: c) deserted: d) divorced:

If married:

When did you marry: Number of children:
Is your husband living with you?
If not, how long have you been alone?
What is your husband doing?

Is he sending you money or some other kind of help?
Does your husband have more than one wife?
If yes, how many?

If deserted/divorced:

When did you marry? Number of children:

How long have you been alone?

Why are you not living with your husband any more?

Are you living with some relative?

If yes, with whom?

If widow:

When did you marry: Number of children;

When did your husband die?

Are you living with some relative?

If yes, with whom?

TO ALL INFORMANTS:

HOW MANY CHILDREN DO YOU HAVE? (For men: 1 wife)

Child	Sex		Age	Doing what				
	M	F		Local sch	Boarding s	Work away	Work home	Married
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

How many of your first wifes children died before the age of 5?

FOR MEN: 2nd wife

Child	Sex		Age	Doing what				
	M	F		Local sc	Board.sc	Work avway	W.home	Married
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

How many of your wnd wife children died before the age of 5?

Are there other persons than your wife/husband and children living with you? If yes, who?

Are you born in this village?
If not, <u>why</u> did you move here?

Are your wife/husband born in the village?
If not, why did she move here?

AGRICULTURAL PRODUCTION

What crops did you grow last season:

Kind	Est. area	Yield	Use of fertilizer		Use of Manure		Use of product
			Yes	No	Yes	no	

Total area of cultivation:

MARKETING

Kind of Product	NCU		Merchants		Local consumers	
	How much	Price	How much	Price	How much	Price

VILLAGE GARDEN

What are growing in your village garden:

Cassava	Rape:
Maize:	Cabbage:
Sweet potatoes:	Cucumbers:
Beans:	Watermelon:
Cowpees:	Pumpkin:
Sugar cane:	Popo:
Tobacco:	Guava:
Onions:	Oranges:
Tomatoes:	Mango: Other:

Do you sell any of these products?

If yes, what?

To whom?

ANIMAL HUSBANDRY

	Number	Use		Other
		Consumption	Sale	
Cattle				
Sheep				
Goats				
Hens				
Chickens				
Rabits				

If cattle owner:

How did you get your cattle?

Inheritance: Brideprice: Buying: Other

If buying, how did you get the money?

When did you last time sell cattle?

Number: To whom?

How did you use the money you got from the sale?

How is the supply of pasture land?

Abundant: Sufficient: Scarce:

Other economic activities:

Do you buy consumer goods that you will sell to your villagers?

If yes, what kind of goods?

How many times did you/your wife brew beer for cutumia since last year millet harvest?

How many times did you/your wife brew beer for sale since last year millet harvest?

Total cash earning from beer brewing:

Do any of the members of your household practice the following activities:

	Who	Use of product	
		Home use	Sale
Handcrafts			
Fishing			
Money collec.			
Game chase:			

USE OF LAND

Kind of crop	Use of manure		Use of fertilizer		Fertilizer	
	Yes	No	Yes	No	Quantity	Type
1 year						
2 year						
3 year						
4 year						
5 year						

How many cultivated plots do you have at the moment?

Do you make mounds?

When do you make the mounds (month)?

When are the field ready for planting (month)?

When did you last clear trees to open new fields?

Once a new field is cleared how many years can it be used before leaving it again?

How long time do you have to wait before growing in the same field again?
What things are important in choosing a new land to clear?

Do you find available land for clearing new fields?
a) next to your actual field/s:
b) near to your actual field/s:
c) far from your actual field/s:
d) no available land:
e) Other:

Is your cultivated area bigger now than it was five years ago?
If yes, how much?

USE OF EQUIPMENT

What equipment do you use for preparing your fields:
Hoe: Oxen: Other:
If oxen are used, are they:

owned: hired: borrowed:
If owned: Inherited: Bought: Breeded:
Did you hire or lend your oxen to other farmers the last season?

If bought: When? How much did you pay?
How did you get the money?

If hired: from whom: Neighbour: Relative: Other:
How much did you pay?

If borrowed, from whom: Neighbour: Relative: Other:

USE OF LABOUR

What family members use to work in your fields?
Is there any agricultural work that can be done only by men?
If yes, what kind of work?
Is there any agricultural work that only can be done by women?
If yes, what kind of work?

Did you use hired labour last season?
If yes, how many persons?
For what kind of work?
What kind of payment?

a) Money: How much:
b) Kind:
c) Other:

Where did the workers come from?

Did you get labour help from your neighbours last season?
If yes, how many persons worked?
What kind of work?
What kind of payment?

a) Kind:
b) Labour (mutual help):
c) Cutumia:
d) Other:

Did you get any labour help from your relatives?
What relatives helped you?

What kind of work?

Did they get anything for helping you?
If yes, what?

WAGE WORK

Do any of your family members work outside the village at the moment?

If yes, who?	What kind of work	Where
1.		
2.		
3.		
4.		

Do they give you some economic help?
If yes, in what way?

Have you been working outside the village?

If yes:

When	Where	What kind of work

Why did you come back to the village?

Do you receive any pension?

When you came back, did you bring any money?

If yes, do you remember how much?

How did you use that money?

FOOD PATTERN

What do you use for making nshima?

a) most used:

b) 2nd most used:

c) 3rd most used:

Did you produce all you needed for nshima last year?

If not, why?

How did you get additional staple wood?

What do you use for making relish?

Do you some time buy ingredients for making relish?

If yes, what?

Consumer dureable goods owned by the household:

Bicycle: Radio: Watch:

Furniture: Others:

ATTITUDES

Generally what are the major developmental problems facing your area?

Specifically what are the major constraints on increased agricultural production facing your area?

Facing your family?

Success in farming depends on:

1. Luck: 2. hard work: 3. Witchcraft:
4. Knowledge: 5 other:

Are you member of any of the following local organization?

1. Party Committee:
2. Village Productivity Committee:
3. Ward Development Committee:
4. Cooperative:
5. Other:

OBSERVATIONS:

APPENDIX III: Questionnaire applied in 1982 (Bemba Area).

1. Village: .....
2. Name of head of household: .....
3. Sex 1. Male: .....
   2. Female: .....
4. Marital status : 1. Single
   2. Married
   3. Separated .....
   4. Divorced
   5. Widowed.
5. No. of Wives: .....
6. Tribe: .....
7. Religious affiliation: .....
8. Household composition: .....

Member	Sex	Age	Education level	Education status	Working on farm	off farm	Non working	Absentee	Comments
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									

Are the relatives in the household living with you all the year?

9. AGRICULTURAL PRODUCTION THIS SEASON.

Parcel	Field No.	Cultivation Mode.	Crop	Area[a]	INPUT Purpose	Type	Amount	From where	Price	COMMENTS
Fruit trees:										

10. OUTPUT AND MARKETING LAST SEASON

Parcel	Field	Crop	Area	Total output	Amount stored Seed	Cons.	Amount Sold	To Whom.	Payment	Input use	Comments

11. When did you start farming?

13 Do you grow the same amount of each as you did 10 years ago?

.....

	Change	Reasons for change
Millet Sorghum		
Maize Beans Cassava.		

14. Why do you not produce more agricultural products?

.....

.....

15. Are you satisfied with N.C.U. Services?

.....

.....

16. Do you know what you will get for your products this season when yo sell to N.C.U.?

.....

17. Did you sell or barter anything to the merchants last year? (what,p

.....

.....

.....

18. Did you buy anything from the merchants? (what, prices)

.....

.....

19. Did you go to town to sell products during the last 12 months? (Frequency, when, where, transport, own etc.)

.....

.....

.....

.....

20. Do you regularly buy:

Sugar	Cooking Oil	Meat
Salt	Vegetables	Soap
Fish	Beer	Paraffin.

32. Labour Use this season:

Crop		Cutting & Clearing	Ploughing & Prep. Seedbeds.	Planting & Sowing	Weeding	Harvest last sea
White. mene.	Start month Amount. days Work/Day Amount,people	-				
G. nuts.	Start month Amount,days Work/day Amount,people					
Beans	Start month: Amount,days: Work/day Amount,people					
Pam Maize	Start month Amount,days Work/day Amount,people					
	Start month: Days Work/day people					

34 (a) What month is there most work to do on the farm?

.....

34. (b) During this period how long do you work on your fields every a day?

	a.m.	p.m.
Husband	.....to.....	..... to .....
Wife	..... to	..... to .....

25. Have you got people to help you on your fields this season?
(casual labour, piecework: money and kind, relatives)

Crop Process	Persons/Amount of work/days	Payment Unit	Payment Total	who were from

26. How many times have you arranged Ukutumya this year?

Crop Process	How many	Amount of work	How much beer
1.			
2.			
3.			
4.			
5.			
6.			
last time			

27. How many times have you been to other peoples Ukutumya since last harvest?

.....

.....

.....

28. How many times have other household members attended?

.....

.....

.....

29. What equipment do you use on your fields?

30. Have you ever used Oxen for ploughing or transport?

.....

31. Have you ever used tractor for ploughing or transport?

.....

32. How do you transport fertilizer from the depot and produce to the depot?

.....

33. What animals do you own

Type	No.	Ownership	How obtained	Who looks after.	Uses	Slaughtered for cons.	HOW DISPERSED ETC. DURING LAST 12 MONTHS: Sale	Live sales	To whom	Price	Form of payment	lost stolen	Breed Purchas.
Oxen													
Bulls													
Cow													
Calves													
Goat													
Sheep													
Chicken													
Duck													
Pig													
Other													

34. Are there male cattle not being used as work Oxen?

.....

35. Why are they not used as work Oxen?

.....

36. Have you ever used credit

When	Purpose	How much	from whom	re...
	-			

37. Have you ever applied for credit without getting?

.....

38. Do you get fertilizer and seed and pay for it when you deliver your products?

.....

39. Have you ever been working outside the village?

When?	Where?	Kind of work.

40. Why did you come back to the village?

.....

41. Do you receive any pension?

.....

42. When you came back did you bring any money?

.....

43. If yes, how much? .....

44. How did you use that money? .....

.....

45. **WAGE WORK**

Has anybody in the household been employed in wage work piecework, or work for others during the last 12 months?

Who?	Where	Kind of work	For how long	Remuneration

46. Have you, or anybody in your household participated in the following activites this season?

Activity	Yes/No	Who	When	How often	Own use	Sale	Income
Brew Beer							
Fishing							
Collecting-Catterpillars							
Collecting-Icikanda.							
Collecting Mushroom.							
Charcoal burning.							
Woodcarving							
Handcrafts.							
Other							

50. Do you own any of the following:

Bicycle ..... Watch .....

Radios ..... Sewing Machine .....

51. Are you or anybody else in the household member of any of the following organizations?

Credit Union ..... W.D.C. .....

Cooperative ..... UNIP .....

V.P.C. ..... Other .....

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