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Handwritten
O. G. Herlitz

THE EFFECTIVENESS OF THE
FARMERS' EXECUTIVE COMMITTEES

A research study carried out from
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Gwembe South Development Project
Box 3
Sinazese
Zambia

The research was carried out on behalf of

The Gossner Service Team

Box 4

Sinazese

Zambia

from

Gudrun Herlitz

Box 4

Sinazese

Zambia

or

c/o Fromm

Saarstr. 1

D-1000 Berlin 41

Fed. Rep. of Germany

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List of Abbreviations

AA	Agricultural Assistant
FEC	Farmers' Executive Committee
GSDP	Gwembe South Development Project
GRZ	Government of the Republic of Zambia
PAO	Provincial Agricultural Officer
SPIS	Siatwinda Pilot Irrigation Scheme
UNIP	United National Independence Party

1. INTRODUCTION

The Gwembe South Development Project (GSDP) is a cooperation between the Zambian Government and the Gossner Mission to promote the agricultural and social development of the region. Here, in the Gwembe Valley the Tonga lived for centuries. The Gwembe Valley is a remote area with hard climate and living conditions. The Valley-Tonga have been experiencing malnutrition and hunger during the years, particularly when the Kariba Lake came into being during the sixties which forced thousands of those people who lived along the Zambezi river to be resettled to the neighbouring higher bushland, where the soil is poor and water is a constant problem.

The major principles of the GSDP are

- to assist the local people to organize themselves,
- to assist the local people to identify their needs,
- and to make better use of the potentials of their area,
- to offer training, financial help and advice as far as being necessary.

In 1970 the Gossner Mission was asked by the Zambian Government to assist her in the planning and implementation of new development programmes in order to improve the living conditions of the Tonga. Irrigation farming which was mostly unknown to the local people was introduced. At present three irrigation schemes are existing, each with a different physical irrigation system and a different management set up.

The farmers have organized themselves being responsible for their schemes. However, they still need assistance and advice. The organisational management body of each irrigation scheme is the Farmers' Executive Committee (FEC). Throughout the years these committees have had major problems in general. This research was initiated to find solutions for overcoming them. Rather than

describing problems and their sources in a general summary this survey will investigate the effectiveness of these committees, the advantages and shortcomings of the organisational set up, and is trying to find the nature of problems by surveying the actual performance of the FEC's, and suggesting solutions for improvements

1.1 Goals

The goals of this research are

- to investigate the cultural and historical background of the Tonga tribe and the area for its significance for and effects on the set up of FEC's;
- to investigate the original theories and/or reasons that led to the starting of irrigation in this area and the significance of these starting conditions for the development of the three irrigation schemes;
- to compare the target performance with the actual performance of the FEC's;
- to find solutions for an improvement of the effectiveness of the FEC's.

1.2 Outline of Chapters

Chapter 1 explains the background of this research and why it was initiated, states the goals of this research, and outlines the chapters. The problems are explained and a definition of effectiveness is given. The focus of this research is stated, a theory and a hypothesis is formulated, the methodology of the research is outlined and explained.

Chapter 2 explains the cultural and historical background of the area and the Tonga tribe in view of its significance for the FEC's. The chapter briefs on some historical events and explains their significance for this area. Some parts of Tonga tradition and culture which are im-

portant for the falsification of the hypothesis as well as for the understanding of some problems that arise at the irrigation schemes are explained.

Chapter 3 gives a brief history of the three irrigation schemes and reports on the reasons that led to the starting of irrigation in this area, discussing the significance of the starting conditions for the present performance of the FEC's.

Chapter 4 describes the actual performance of the FEC's from the FEC's point of view, the farmers' point of view, the very Agricultural Assistant's (AA) point of view, the Government's representative, e.g. GSDP, point of view, and from the representative of the donor agency's point of view.

Chapter 5 is stating the target performance from different points of view and is comparing the target performance with the actual performance of the FEC's and evaluates the findings of chapter 2, 3, and 4.

Chapter 6 states various proposals for problem solutions from different sources.

Chapter 7 is an evaluation of the problem solving proposals of Chapter 6 where the researcher states her own conclusions and proposals.

1.3 The focus, theory, and hypothesis

All three irrigation schemes have a history of at least 17 years. Their FEC's were not founded at the beginning of each irrigation scheme. Still, all committees have a history of at least 10 years. With the up and downs of each scheme (see chapter 3) all the committees throughout the years had one major problem: they were not able to

work effectively in a self sufficient manner. The various signs of ineffectiveness seem to have a general pattern though they might not occur at the same time at each irrigation scheme. The definition of effectiveness certainly must include the economical point of view. But, the FEC's being the focus of the research, this economical consideration cannot be a survey of the input-output relationship of the scheme. The definition of effectiveness in the economical understanding is:

- the FEC's have to be able to keep records of the inputs and outputs of the scheme;
- the FEC's have to be able to interpret these records to prepare a budget;
- the FEC's have to be able to raise appropriate funds in time for the economical running of the scheme.

The non-economical definition of effectiveness only can be defined by stating the target performance from the government's point of view, the donor agency's point of view, and from the FEC's point of view (see chapter 5). These targets have to be the standard that applies to the FEC's.

The introduction of modern technology is sometimes blamed for project failures, but technology as such is neutral; it is how it is selected and applied that matters. Nevertheless, it is a natural desire amongst developers to do the "best". New technology brings changes, not only for the daily working routine, also and even more for the social life of those involved. Though new technology is meant to improve the living conditions of those it is meant for, it creates dependencies on resources that often cannot be met by the people who are expected to appreciate the development. The bottom-up approach of these three irrigation schemes (see chapter 3) was meant to be a technical help for improving the life of the

farmers involved. By giving them space for taking initiatives, gaining confidence they were expected to adopt new methods.

(see also FAO: Small scale irrigation in Africa, 1984)

Though the new techniques, irrigation as such, were slowly accepted, the understanding of what was expected of the farmers still is a problem to the organisational body of these irrigation schemes. The space to adopt the new method was there!

The hypothesis for this research is, that the reason for the difficulties the FEC's have, to work effectively, must be found in a conglomeration of four factors that led to the present condition:

- the historical background of the Gwembe Valley approximatly since 1900;
- the tradition of the Tonga tribe;
- the history of formal education;
- the approach to the farmers that was made during the time when the very irrigation scheme was started.

It is a general phenomena in Africa that cooperatives like irrigation schemes tend to fail. The reasons given are plentifold and depend on the very set up and nature of the cooperative (see Bakurumutsa, 1982).

Evaluations of cooperatives of the GSDP state in general: "... there is no evidence to date that producers' cooperatives of any sort are a viable form of organization for the Gwembe Valley, whether composed of farmers, fishermen or builders." (Colson et al., 1982). In almost every evaluation and project report of the GSDP it is stated that the cooperative idea is not common in Tonga culture (see various reports on Maaze Consumers Cooperative, Gwembe South Builders Cooperative Society, and so on, in the GSDP archives). Though the government of Zambia

emphasizes cooperative set ups and favours them, in the Gwembe Valley it is stated, that this set-up is inappropriate (at least for the time being). The reasons for the inappropriateness of cooperative set ups, whether this applies for Africa in general or is Valley-Tonga specific, cannot be found in the tradition and history of an area and tribe alone. Because the management set up, the cooperative idea, was "forced" upon the Valley Tongas, this creates problems to such an extend that though the new technology is accepted and the improvements appreciated, the functioning of an effective organisational body cannot be achieved.

1.4 Methodology and approach

Since part of the hypothesis of this research is, that the problems have to be found in Tonga tradition and history, it was first of all necessary to study the social organization of the Valley Tonga. With this background and a study of the history of each irrigation scheme as well as of the area, the actual approach and data collecting at the irrigation schemes were easier and informations better understood. The approach and introduction of the researcher to the FEC's had to be done very carefully. The committee members have had different experiences with consultant groups, government officials and alike, some of them came for surveying the actual conditions of the schemes, made promises and nothing happened. Therefore, the researcher was always introduced by either the project adviser or a staffmember of the GSDP with a clear statement that only a research is conducted and no promises can be made.

Since the educational level of the FEC members is such that some of them cannot express themselves in English, a translator was always needed.

After the introduction the researcher held own meetings with the FEC's, always using persons for translating the

FEC members chose themselves. This resulted in a slow opening up of the FEC members so that they agreed to the recording of the meetings and interviews. The interviews were done with a fixed questionnaire, but only verbally, since a lot of the FEC members have difficulties in reading and writing. This recording method shortened the interviews because the researcher had to be briefed only on the answers. A later translation of the tapes by a different person who was not involved in any irrigation scheme ensured the correct and precise informations. After the approaching phase a test-run for a questionnaire was done. Each irrigation scheme had an specially designed questionnair and therefore each irrigation scheme had one test-run.

During that time the FEC members were already very open and trustful to the researcher. This confidence towards the researcher resulted in a closer relationship where not only research matters were discussed. Especially at one irrigation scheme the researcher was called upon when urgent problems had to be solved. This active participation in the work at the scheme is seperated from the actual research work as much as it was possible.

After the test-run of the questionnaires these were slightly changed and the final questionnaires (see Appendix 1 - 4) were used as a data collecting for the findings. The interviews were accompanied by observations of the researcher of the actual performance (like book-keeping, writing minutes, etc.).

Additionally to the interviews of the FEC members, the farmers of each irrigation scheme were interviewed with a specially designed questionnaire for each irrigation scheme. After a test-run on each scheme the questionnaires were slightly changed and the final questionnaires (see Appendix 5 - 7) were used for data collecting for the findings. All other informants were interviewed in an

open interview. The researcher was always emphasizing that the focus is on the FEC and not on the scheme itself.

Throughout the field work the researcher always checked, especially informations on the traditional background and language percularities (counting and measuring system) with various other informants who are deeply familiar with the area and the Tonga culture. Many of these informations helped the researcher to understand certain answers which was important for the conclusions the data collected allowed.

Each FEC has at least 8 members, one chairman, one vice-chairman, one treasurer, one vice-treasurer, one secretary, one vice-secretary; Nkandabwe irrigation has two trustee members, Siatwinda irrigation has three trustee members, Buleya Malima irrigation has three trustee members.

In Nkandabwe irrigation seven committee members were interviewed, in Buleya Malima irrigation five committee members were interviewed, in Siatwinda irrigation seven committee members were interviewed.

Among the FEC members the most important positions are those of the chairman, the treasurer, and the secretary. The holders of these positions of each FEC were interviewed. Therefore, the significance of the interviewes is justified.

The interviews of the farmers: Nkandabwe has 86 farmers, 19 (22 %) were interviewed. Buleya Malima has 54 farmers, 21 (38,88 %) were interviewed (these interviews of farmers in Buleya Malima included canal committee members, see chapter 4). Siatwinda has 75 farmers, 31 (41,33 %) were interviewed.

The random samples for these interviews were chosen as follows: the interviewed persons were chosen from different

sites of the irrigated area, since it turned out that at some places for instance all old members of the scheme, or all committee members have their plots next to each other.

The interviewed farmers were all asked before the interview started if they are the plotholders or just temporarily working on the plot for somebody, or were given the plot to use by the plotholder. If they were plotholders and if they were given the plot by the plotholder to use it for a longer period (for more than one cropping season) these persons were interviewed. Though some lists of farmers at the irrigation schemes showed less female farmers than interviewed (Nkandabwe irrigation showed only two women) more were interviewed because of the above mentioned way of choosing the random samples. Since the objectives of the interviews were to find out how much the farmers knew of their FEC and to find out the educational level of the farmers who deal with the selling of the crops, this choice of random samples is justified.

It was not possible to choose random samples according to age. Most of the farmers do not know their year of birth and it turned out that this question and the not-knowing is embarrassing for some farmers. Therefore, this question was left out at one irrigation scheme completely. The interviewer tried to choose farmers by age according to sight which is very unreliable. It turned out that it is not a matter of age whether farmers know their year of birth. A lot of young looking farmers did not know their year of birth.

Therefore, the significance of the random samples are only justified according to the effort the interviewer made to choose an even amount of female/male farmers, an even distribution of interviewed farmers of the irrigation area and an even distribution of interviewed farmers according to age as much as that

was possible from sight.

Some information in the interviews could lead to an vague idea about the approximate age of the interviewed farmer. Since the objectives of the interviews were the knowledge of the FEC and the educational level of the farmers, this was left out in the analysis completely.

The questionnaires for the irrigation schemes, the FEC and the farmers questionnaires, are designed according to the special situation at the scheme. During the time when the researcher was introduced to the FEC's and the scheme she learned about the special level each FEC is working on. Therefore, the FEC questionnaires were designed according to this level.

The questionnaires for the farmers were kept as similar as possible, only some questions were added or left out according to the management set up of the scheme or the payments or marketing procedures of the scheme.

An explanation of the set up of the questionnaires can be found in the Appendix.

Each AA and each GSDP adviser responsible for the very irrigation scheme were interviewed several times in an open interview. In Buleya Malima the scheme manager was interviewed several times as well. Since Nkandabwe irrigation has no project adviser, members of the GSDP staff who were involved and familiar with this irrigation scheme were interviewed in an open interview.

For the Government's point of view the GSDP co-ordinator and representatives of the Provincial Department of Agriculture were interviewed in open interviews.

2. HISTORICAL AND CULTURAL BACKGROUND OF THE VALLEY TONGA

"... the Valley people remained until the end among the most independent people of the peoples of Central Africa and the ones who were the most firmly in touch with an older world." (Colson, E., 1960, p.34). The Gwembe District had an educational lack in comparison with other rural areas of Zambia. It was only in the late 1960s that Gwembe District began to reach the educational level of the rest of the country. In Mweemba Chieftaincy the first cadre of an "elite" emerged and it was still apparent in the 1970s that Mweemba Chieftaincy held an advantage over the rest of the district.

The history of the Valley, the history of the educational possibilities are surveyed in length (see Colson and Scudder, 1960, 1962, 1971, 1980). For this survey only those parts are pointed out which are important for the understanding of the findings.

Plateau and Valley Tonga

The Tonga tribe always separated themselves into two groups of Plateau Tonga and Valley Tongas. The Valley Tongas feel to be the real, original Tongas, who never really mixed with any other tribe, who speak the real Tonga and preserved the heritage of Tonga tradition. The Plateau Tonga being those who live on the escarpment and the plateau, later those who mainly lived along the railway lines, are thought of as Tongas who mixed with other tribes and nationalities, who lost their origin, language- and traditional-wise. Actually, always those who lived more westernly (north-westernly), starting from the Zambezi river side (for the Zambian part of the Tonga area), were "less" Tongas. Therefore,

for the Zambezi-Tongas already the ones living in the hills that led to the plateau were Plateau Tongas, for the Tongas living on the escarpment, the people living directly on the plateau were the "less" Tongas. For Plateau Tongas the Valley Tonga always were and still are the backward and poor part of their tribe.

(see Scudder, 1962)

2.1 Barter and money

In 1898 the British South Africa Company established an administration for North-western Rhodesia which was later incorporated within Northern Rhodesia. The administrative headquarter was built in Kalomo.

Barter

Up to this time the Valley Tonga were only used to barter, they exchanged their goods, mainly using only what they grew, what they produced themselves. They were patient tradesmen. Sometimes a trader from the plateau came and was given a bag of tobacco or something alike he could use for his business. The Valley people then waited for him to come back with something in exchange, they waited a year or even longer. Some of these tradesmen never came back, others came back and if they brought satisfying goods from the plateau, they were given something again. Of course, the local barter demanded a faster repayment, but even here, some of the dues took years to be paid.

(see Colson, E., 1960)

The first white men for the Valley people were the early missionaries, explorers, who brought beads and such goods to pay for food and labour.

The need for money

The main and direct route from Kalomo to the centres of South Rhodesia lay through the Valley and across the Zambezi at its southern end (Walker's Drift or Sijoba).

For a few years (until 1906) the valley was to be more frequented by Europeans than it would be again until the 1950s. These years were the first time Valley people were introduced to money and the meaning of it. In 1904 the Northern Rhodesian Administration imposed the hut tax on the Valley people. The early administration seemed to have little difficulty in establishing their control. But the Valley people now needed money. With the coming of the Rhodesian railway in 1906 the old route across the Zambezi lost its importance. The hut tax money could not be raised by many people.

With the need for labourers for the railway and the new farms along its line the British Administration took those who could not pay their tax by force and used them for cheap labour. These men had to work between three and six months outside the Valley to work off a year's tax. Some of the roads, done by pick and shovel by those men still can be seen today. (see Colson, 1960; informations given to the researcher by Valley people).

Isolation

After the headquarters for the new Gwembe District were moved to the plateau the valley was only visited by an occasional touring officer, messengers would summon the people to pay their taxes. Thus for many years the valley remained in isolation.

Except for the road from Chirundu to the Zambezi near the Kafue confluence which was built in the 1930s, no roads led into the valley. "Access could be had only by foot-paths and these as they wound through the rugged escarpments were of such nature that a bicycle was a hinderance rather than a help." (Colson, 1960, p. 31)

The Valley people continued to lead their own lives, there were changes of course, but it is difficult to see that these administrative changes made much difference to life within the valley during those years. Only its men came in close contact with the world of the Europeans. Almost every one spent some years to work in the mines of Southern Rhodesia. They already started to go off for work before 1900, but after the hut tax was imposed on them, it was vital to get money. Those who went to work could bring little back, therefore little entered the valley. Only a very few women left the valley until the 1950s.

Money, women, and the traditional system

If men could sent some money it was never any women who was entitled to spent the money, even if it was meant for her. A male relative distributed the money and looked after it or saw to it, that it was spent like it was indicated by the sender. Though money was known in the valley, especially women could not actually deal with it. Never could money be used for the bride-payments, elopement dues, or dues for ritual services. The value system remained as one of exchanging goods, all items were measured in volume measurements like baskets, bowls or clay pots, everything having a fixed exchange rate. Only if nothing was left for exchange money could be used for certain goods. Their old system was a system they knew and easily could deal with.

(Information given to the researcher by Valley people.)

2.2 Experiences with Colonial Government Authorities

The question here cannot be: how did Valley life develop under the Colonial Government, it rather has to be: how did the Colonial Government interfere with the existent Valley life and agricultural cycle. Throughout the cen-

turies the rural life had proven to be very adjustable to the changes of climate and wheather conditions, to the introduction of new crops (maize, groundnut, cassava - 17th to 19th century). But the British Administration interfered with the farming cycle by their almost unappeasable need for labour fources. The agricultural cycle to which village life had adjusted for centuries was disturbed by the need to raise money for taxes, men had to leave their homesteads in increasing numbers to meet these demands. For the ability to adjust to changes it was important that the innovation had to be accepted as well as it had to fit into their agricultural cycle. With the building and development of railway lines, dams, coal-mines and large (white) farms which demanded labour forces the rural family was overstrained. The ability to adjust was finally destroyed by the building of Kariba Dam.

Already in 1940 the cassava-growing law was imposed on the Valley Tonga as a prevention of the continous famines that struck the area. Cassava was never grown in the area before and the Valley people were not used to it. Neither were they used to the imposed way of the communal village garden, where the cassava had to be grown, the village headman being the owner of the garden. The Tonga agriculture is based on individualism. Though mutual work is done, it is always the field owner who calls for work and is rewarding those who work for him/her. This forced cassava growing brought some deaths, since the Valley people did not know how to eat or prepare cassava, many died of obstipation.

After the cassava-failure the village graineries were imposed on the Valley Tonga. This, being a much better success, was not followed up in the 1950s. The idea was that each village had to lock up a certain amount of grain for at least one year to prevent the people from eating up their seed-grain.

Though trading stores began to penetrate the Valley and a new demand for money arose, these changes took place in the late 1940s and early 1950s. The village life of the Valley Tongas was only effected in that, that people knew of money and admirable "luxurious" goods which only very few could afford to buy. The Valley people were far from being able to deal with these changes and competing with those who were educated at the plateau. They continued to live from what they grew and remained with their system of measurements, using money only when it was necessary.

Resettlement

With the start of the resettlement programme for the Kariba Dam project the big changes started. Though roads were built for the lorries and machines that were necessary for clearing the bush, the resettlement brought deprivation of land, disruption in the social organization of the Valley Tonga. The very isolation which men had once regarded as one of Gwembes chief assets became a threat to the resettled people under the new circumstances. They had a new awareness of their dependence on the Government and on the resources from other areas. In 1949 they expected little or nothing from the outside world and felt no deprivation when the rain cut them off from the plateau and railway line. In 1957 they depended increasingly on services which required the maintenance of a road system. Survival now depended on servicing water installations, people began to use agricultural equipment which required spare parts.

The increased numbers of dispensaries with its medical staff now felt to be necessary to milder the crisis of resettlement, the increasing number of teachers and technical assistants created an increasing number of shops. These new people were much more dependent on trade goods than the average villager

who still grew his own food and had not yet aquired a taste for imported luxuries. Nevertheless, money was now important and the old system of exchanging goods could not do alone even on village level anymore. Money was given for compensation for the lost land during the resettlement which was mainly used for the education of children or to start a business (fishing). These, for the Valley people, relatively large amounts of money now coming to the Valley made cash and stock more available after the resettlement.

The land those resettled people lost was compensated by less furtile land, by land far away from their homesteads, neighborhoods were torn apart, lines, clands and even families scattered throughout the Gwembe District. The little money that was given as compensation in some cases could by far not make up for the disastrous results of the resettlement. Promises were made that the infrastructure would be improved, electricity would be in every village and so on. Valley Tongas with their deep link to landownership which is part of their social organization and cultural order could not get used to the new and less furtile land they were taken to. Apart from fear and suspicion that created some crisis, a permanent land basis is necessary to ensure long term lineage solidarity, but land itself is not enough to stabilize relationships.

Women sometimes used this time of disturbed social order as a loop-hole for their own wishes. For the first time it was possible to act on their own will. Many left their husbands with the excuse that they want to live with their relatives who were resettled in a different area. So they left their husbands. Whether it was the missing of the relatives or the dislike of the husband is not important, what is important is, that they actually did what they wished to do. Many men who remember the times of resettlement nowadays refer to this time as the very

time when women started to disobey their husbands. Women became more used to changes as such, to money handling, some had to make a living on their own.

(Information was given to the researcher by Valley-people.)

In 1962 the crisis of resettlement was over and with the rains of 1962/63 Lake Kariba reached its full extend. After the resettlement people were forced to enlarge their intellectual horizon as people became more and more concerned with political events on the national level.

The heritage of the British Administration

Independence brought the big relief from Colonial/Federal pressure, lastly so very much experienced by the Valley Tongas. Their experience with the British Administration had created a fear for being appointed to work for the British Administration or any "white man". This fear of being appointed to work for somebody is still deeply rooted within the people. When the representatives of the British Administration came to claim what they told was a law, they appointed people to carry out their wishes. If this person failed, he was punished heavily. If people could not pay their dues they were punished heavily. Therefore, it was never popular to be somehow employed by the Colonial/Federal Government.

Valley people never had any other experience with the British Administration. They did not share the prosper brought by investments as the Plateau people were able to and no public service ever reached Gwembe. The most disturbing changes brought to them were so disturbing because they rarely understood why and what was expected of them.

Ever since Valley Tongas cannot be forced to take any kind of responsibility, since nobody can just appoint them, it is logical that they refuse to take responsibility for something they do not understand. But the experience of punishment resulted in a general attitude which can be experienced largely even today, that Valley people, even when they understand, are reluctant to take any responsibility for matters that are not part of their familiar life. Even if responsibility is formally taken, Valley Tongas tend to try to blame others for any failures. It is not so much the seriousness of the failure or the amount of work involved to straighten matters, as long as they are not blamed for anything they are satisfied and will work hard to get matters in order again.

With independence a need for coal for Zambia's copper belt arose, Zambia stopped to import coal from the south. The road from Batoka into the southern part of the valley was tarmaced. Easier access was needed for coal exploration and in 1964 Nkandabwe coal-mine came into production. Again a new need for trade goods was created for those working in the mine, transport became even more familiar and money was conquering the valley at last.

2.3 Formal Education

The Primitive Methodist Church established a mission in Sijoba in 1901. In 1907 it was moved to Kanchindu, this being the first primary school in Gwembe. For many years thereafter schools were confined to Mweemba Chieftaincy. Between 1925 and 1940 a few opened in other Chieftaincies.

The first population estimation available for the Gwembe District was done in preparation of the Kariba Dam resettlement programme. In 1956 the estimated population was 48.753 , but during the resettlement the actual population number rose to 57.964 in 1959 and it was realized that in 1956 the population was underestimated (see Colson, 1962). Therefore, it is justified to take the population estimation of 1956 as a population number which at least lived in the Gwembe District in the 1940s.

For a population of 48.753 by the end of the 1940s only 44 schools existed in the district which stretched over 200 miles from southwest to the northeast, only two of them provided middle primary classes, none taught upper primary. In the early 1950s the district still lacked behind the rest of Zambia in quality and number of schools, training and quality of teachers and the proportion of its childeren in school.

Teachers in the valley

Teachers and other professional people stationed in Gwembe found it difficult to retain a standard of living above the village level in the absence of roads, trading stores, postal services, other people who shared their interests and values. Those who had any choice chose to work on the plateau along the railway line. In Plateau Tonga country teachers dealt with more sophisticated parents who were educated themselves and had evidence of the advantages of education. The dislike of those teachers of Gwembe with its heat, living difficulties and antogonistic village people was reciprocated by Gwembe children who reduculed the pronunciation of teachers who spoke Plateau dialects and made their lives as miserable as they could. While on the plateau people were petitioning for schools, teachers in Gwembe District had to battle both the hostility of the children and the indifference or hostility

of most parents who could not see any advantage to school.

Education and early investments

The different support bases for teachers in the two regions are directly linked to differences made in levels of investments and these spring from decisions made first by the British South Africa Company and later by the British Colonial Administration during the first half of the twentieth century.

After the withdrawal of the administrative centres out of Mweemba's Chieftaincy and the crossing of the Rhodesian railway at Victoria Falls rather than at Walker's Drift, attention and investment centred on the plateau rather than in the Gwembe District until the late 1940s. The only money that was spent for the Gwembe Valley was for famine relief. Gwembe was deprived of all public service investments.

Mission "investments"

The missions which pioneered education in Zambia also concentrated most attention on the plateau. By the mid 1920s Plateau Tongas were served by five mission groups while only Kanchindu existed for Gwembe. In 1939 the oldest Tonga mission in Kanchindu closed, leaving only a Gwembe Tonga pastor and a number of school teachers in Kanchindu. It reopened its mission station in 1954 (see Colson, 1980).

Gwembe District began to improve its situation between early 1956 and 1963, largely due to government and mission initiative and the determination of a tiny minority of progressive and educated leaders in the Rural Council, most of whom came from Mweemba, Sinazongwe, and Sindambwe chieftaincies. The number of upper primary students in-

creased rapidly but only few Gwembe children went on to a secondary school. Failing to succeed in competition with the secondary school trained Plateau Tonga, upper primary school-leavers from the Valley failed to get white collar jobs. The parents who did not know that secondary school education was needed for such jobs regarded the expenditures on upper primary school as wasted and were discouraged from supporting smaller children beyond the village school.

In the years following independence (1964) upper primary schools spread in Gwembe and the perception of children and their parents changed. Education now mattered, everybody had equal chances for education and employment. A transformation occurred and by 1972 a Gwembe elite was established. 500 Gwembe people had left secondary school while several hundred others had completed one or more secondary school correspondence courses. Evidence is given that those who are among the first elite of Gwembe are children of the very ones who had the chance to get some education from the missionary schools.

Even though the attitude of the Valley Tonga remained more or less hostile until the 1950s towards education which was forced upon them by law, those who did go to school were encouraging their children to get educated even further. The slowness of Gwembe people to respond to the possibilities of education initially was linked to the lack of opportunity for those trained at school. If government positions were available Gwembe people had to compete with Plateau Tongas. Though most employed personnel in Gwembe who was not Gwembe born preferred assignments elsewhere were stationed in Gwembe because local candidates lacked the educational qualifications to fill the positions. (Colson, 1980)

The metric system

To those who became more educated and were able to handle money by trading, a new problem arose with independence 1964. The new metric system of the national currency and the new metric measurements had to be learned. For many of the Valley people it was too difficult, they kept the old system, using fixed exchange rates from Found to Kwacha up to now.

Village life

Education improved and women had more access to schools and were allowed to deal with money, spending what belongs to them as they wish. But for those who remained in the villages the new system of counting and measuring they had learnt at school was forgotten soon. In the villages they joined the old folk again and here the standard baskets and the Pound were still those value systems that mattered. They could not practise their learnings and therefore it is still a problem today for a lot of farmers at village level to read a scale and to work out change.

In 1970 The Gossner Mission was asked by the Zambian Government to assist her in the planning and implementation of new development programmes in order to improve the living conditions of the Tonga. In 1972 the Gwembe South Development Project came into being.

(for the information of chapter 2.4 see also Colson, E. 1956, 1971, 1980)

2.4 The Social Organization of the Valley Tonga

- leadership, democracy, mutual work

Heritages

The Valley Tonga have a very differentiated system of heritage, always in maternal lineage and not only for the material goods, even more for their shades. The belief, that each human being that passes away will be able to express his/her feelings and whishes to the very person that inherits the shade, is the old traditional Tonga belief. The shades are the link to their God - Leza - and it is important that the one who inherits the shade of a person is familiar with the personality, the whishes, and the attitude of the deceased. There are men who will inherit the shades of men and women who inherit the shades of women, never can a man inherit a shade of a woman or vice versa. The more shades a person inherits the more respected this person will be, especially if the inherited shades are from respected people. Those who have inherited many and important shades are the ones to whom most of the people will listen if heritage decisions have to be made. Therefore, a clan always has a male and a female leader, each responsible for the heritage of their own sex.

Clan decision

Before the British Administration in the 1930s demanded the Chiefs of the area as a representative of their government, each chieftaincy had its clan from which the chiefs were drawn. When a chief died, a brother could be the next chief or a son of a sister of the former chief, never a woman. The decision who actually should be the next chief was discussed in a clanmeeting. If a brother of the former chief seemed to have either not the appropriate abilities or was thought of as unworthy, the clan decided who should be the next in line to become chief. It was done through elections and was never forced upon by dominant leader who used his position. (Information given to the researcher by Valley people.)

And so it was for all heritage matters and still is. These decisions are made in a mutual agreement and here women have as much to say as men for their matters. If a woman interferes with a male-heritage by proposing a better problem solution than men could come up with, it is well accepted. Men respect women in these matters and it is common to ask them for advice and decisions. In some cases it happened that a woman was the only one who could solve problems of heritage at a funeral because she was the only one who could remember the life of the deceased. (Information given to the researcher by Valley people.)

The confusion with the Chiefs

When the British Administration demanded of the Valley people to send their chiefs, some chieftaincies did not dare to reveal their leaders and sent noneties instead. The fear of the unknown, that they did not know what the British really wanted their chiefs for, led them to solve this problem their way.

The British Administration needed closer contacts to the communities of the Tongas. They wanted a person who was respected as a leader in his own society and who could communicate with the British Administration. The purpose in the long run of seeking better communication was to improve the administrative system for getting a better control over the population as well as having better means of carrying through their laws. (see Colson, E., 1956)

When it was obvious and experienced what the British wanted the chiefs for this post, even if it meant working for the British Administration, was favoured, because the responsibilities that had to be taken were familiar for Tongas. When these chiefs got more and more power, those who sent noneties waited until the so called "chief"

died and than revealed the real chief. Since those sent initially were protected by the British Administration they only could exchange them after his death, not wanting to admit that they had fooled the British Administration.

This was the time when the confusion started which sometimes occurs even today, when a chief has to be elected. Because ever since "faulse" chiefs were sent, the family or clan of this person claims to be the one chiefs have to be elected from in the future. The original clan of the chiefs claims the same. Ever since this confusion started there is a competition and not a mutual agreement anymore. Nevertheless, chiefs still are elected.

When the British Administration started to appoint village headman by introducing the village as an administrative unit, these men were often already recognized leaders of their localities. Here again the responsibilities these village headmen had to take were familiar to them and this post was favoured.

Later the native administration of Northern Rhodesia abolished many of the small chieftaincies and incorporated them into seven larger units under seven chiefs, one of whom was recognized as a senior chief. This creating even more difficulties for the Valley people, since now not only the clans of the original chiefs and the "sent" chiefs competed in the heritage of the chiefs post, but also those clands who were deprived of their chieftaincies and incorporated with others.

Responsibility

After the first period of insecurity was overcome, these positions of chiefs and village headmen are favourable ones, people in the Valley compete for and are only too glad to take. The responsibilities and the actual work which is often not paid for will be taken without hesitation. It

is something they know and it always was part of their culture. They know what is expected of them, they know that if punishment will be given, it is for something they are aware of and understand as wrong doing or failure in their social organization. Here again, women cannot compete. Their only share is that they can "give" their sons to become a leader.

Women

The homestead is a place where women have their leading positions among themselves. On funerals when the heritage problem has to be solved they can speak up and make their points with or against men. In the homestead the social ranks are between women only. For a polygamist it is a law that his first wife is the leader of his homestead for domestic matters. The husband gives orders to her. He might gather his family together and inform everybody but always leaving strong command to his first wife. All other wifes and children have to follow her orders. Of course this is not always practised today. But usually this is when problems and confusions start in a homestead or family. The traditional law is that a wife must obey the husband and the second wife must obey the first and so on. When village headmen or clan-meetings have to solve family problems they will judge by these traditional rules. The only right a woman has to disobeye her husband or a first wife is by proving that she was neglected (by the husband) and/or mal-treated. That is her only way to get a divorce in "honour".

It seems that women though they are very much aware of their burdens in the running of the houshold and their dependency on their marriage ties, rather prefer these disadvantages than breaking out of their social system.

Of course, there are women who get out of the valley, manage to get a higher education, and might find a well

paid job either with or without the support of their families. They rarely will be married to a polygamist. But the woman who has to struggle most for her education is the one who is thought of as a future wife who will have children and a homestead to keep. These women, once they are married have no intention to break out of the social system. Whether it is because they do not want to or because they are not able to will hardly be investigable.

The value of formal education

But even if the education is accepted as a way to better life, girls have less chances if there are brothers and the funds are not enough for all children.

This is generalized, of course, and in the last decade only very few parents denied their children education at all. But since it is very often beyond the financial limits of parents to support an education that would carry a child far enough to have a chance to find a well paid job, an attitude developed that a minimum of education will do.

But even at village level evidence shows that only a few years of primary school is not enough to enable a person to manage in a life and in a surrounding where English is the official language which has to be learnt first and where money handling is vital.

It shows that farmers are not ready to sell their crops for a proper price. Farmers are at the mercy of the marketeers when they try to sell their crops and very often they do not realize that they get cheated. And this applies for men and women since today women are allowed to handle money and very many of them are business women or go to the markets to sell their goods.

Despite the little education they get in the primary school another reason for their difficulties is that

their village folk is very often still not used to the measurement and money system of the country. They join in again and it takes only a few years and they have forgotten what they learnt.

Only the experience of the advantages formal education is holding potentially, even for a farmer at village level, will change this attitude.

Mutual work

The traditional system of heritage includes a system of landownership (which cannot be described here). Any land that is owned individually or was given to an individual for use is cultivated by the owner him/herself. In cases where this is not possible a relative might help or cultivate all land for the owner. If this is done, the one who helps has a right to claim a certain amount of the harvest, or if he/she was cultivating alone, can claim the whole harvest, only, if at all, giving a small portion to the landowner. Even when wifes cultivate the land of their husbands or vice versa, they claim a certain amount of the crop as their share due to them for the labour.

If a field owner has to employ people to work on his/her land, traditionally he/she called a work party. Beer was brewed and food prepared. Everybody who worked was supplied with beer and food while working, sometimes portions of food were prepared to take home to the families. This was the common way to pay for labour.

Tongas had never fields that were owned by a number of people, they never had community gardens. When the cassava-growing law was imposed on them these village gardens became a problem since Tongas were not used to this kind of mutual responsibility and sharing.

Up to today their agricultural life is based on individualism.

3. THE HISTORY OF THE IRRIGATION SCHEMES AND THEIR FARMERS' EXECUTIVE COMMITTEES

Ever since the start of settled agriculture irrigation has fascinated mankind with its possibilities of challenging the harshness and vagaries of the climate by artificially controlling the plant's most vital need, its water supply. Irrigation has been practised by peasant communities throughout the world. Small scale irrigation is, therefore, hardly a new idea.

In the context of third world development in the past 30 years small scale irrigation is an old idea being re-discovered. Large scale schemes certainly have a place with their more effective way of introducing the benefits of irrigation to national economies. The problems encountered with large scale irrigation have led to profound rethinking of the assumptions and methods employed and to a new interest in small scale irrigation development at the other extreme. The opportunities for expanding small scale irrigation in Africa are considerable. This development will contribute to the solution of the food production problem through its major role in rural development, mobilizing indigenous knowledge and skills at low investment costs.

For the Gwembe District Government has failed to create more favourable policy environments to encourage self help activities, supported by judicious investment and technical assistance. However, the experience shows that the self reliance and motivations of indigenous management groups can easily be undermined by too much external assistance, and that is a real danger in the present situation.

(see also Freedom for Hunger Campaign, 1983)

3.1 Nkandabwe Irrigation Scheme

During the preparations for the resettlement (1956-1959) Nkandabwe Irrigation was established. This irrigation scheme was initiated to compensate the resettled people for the land they had lost at the Zambezi river.

A concrete weir in the gorge of the Nkandabwe river created a storage dam and pipes conveyed the water from the dam to a lower river deposit where the gardens were allocated. The water could reach the plots by gravity. The scheme had a technical set up which suited the know-how of the local people since no machines for pumping were involved. However, irrigation was new to those people, they did not understand what was expected of them.

The start

The Department of Water Affairs, Monze, with funds from Gwembe Rehabilitation, wanted to allocate 30 local farmers on 1/4 acre (0.1 ha) plots. Initially the non-resettled farmers were meant to have preference since they had to share their land with the resettled people now. According to the information given to the researcher by those farmers who were the first to be recruited the original Nkandabwe people mistrusted the Government, having the cassava-growing law still in memory. It is told that they feared that with the recruiting of plot-holders at the Nkandabwe Irrigation Scheme this forced growing of a certain kind of crop could be the real reason for the establishing of the scheme. Therefore, it was not easy to recruit farmers. A local person was appointed to recruit people from a wider circle.

The scheme started with 6 farmers each holding a plot of 0.1 ha and it was promised that the most successful farmer would get 0.1 ha additionally after a year. When

people saw the results and felt safe from their Government, more farmers were willing to be recruited. After one year the scheme had 3 farmers from nearby villages and 27 farmers who were resettled from the Zambezi river side.

The coal pit

In 1964 with Zambia becoming independent imports of coal from the south stopped and the Gwembe Valley was explored for coal. In Nkandabwe an open coalpit came into production and the gravel road into the valley from Batoka was tarmaced, heavy machinery and labourers from outside came to Nkandabwe.

In 1967 heavy seepage of water into the coalpit endangered the mine. It was thought that the stored water at the dam of Nkandabwe river causes this seepage. To save the coal pit the dam was blasted. It turned out that artesian wells which were hit while mining caused the seepage and not the stored water. The coal pit was drowned and the irrigation scheme was seriously damaged. Compensation was claimed by the farmers from the mine board, but files "got lost" at the BCMA and the Department of Agriculture. Neither from the Government nor from the farmers' side any attempt was made to repair the irrigation system though irrigation conditions were most favourable.

It is understandable that the farmers made no attempt to repair the scheme. They had no evidence that the Government really cared about their living conditions and as they just had experienced, national interests had preference, the coal mine was more important than their irrigation scheme. How could they be sure that an effort made by them would not be destroyed with the next national plan made without them?

Nkandabwe Irrigation Scheme as a Gwembe South Development Project

In 1972 the GSDP was founded and it accepted the rehabilitation of Nkandabwe irrigation as one of their concern and appointed an expatriate from the Gossner Mission as a project officer. The river bed of Nkandabwe was dammed again and the overflow was connected with the coalpit lake. On a lower level a second dam was constructed to have a larger water reservoir. At the outlet of this dam the water is led into a main canal and reaches the irrigation scheme by gravity. The canal is layed out with burned bricks.

The new start

The first committee to distribute plots was formed, the selection committee, consisting of Chief Sinazongwe, village headmen, staff members of the Department of Agriculture and the GSDP. It distributed the plots by balloting. An AA and the GSDP adviser (Gossner Mission) were posted to the scheme. 34 farmers started to work on their plot now.

In the first year the report of the project adviser states that irrigation as such was accepted by the farmers, but that the scheme by no means could be managed or looked after by the farmers or a representative group elected amongst them. It is reported that the original Nkandabwe people brought with them their shrines (tombs which have ritual meanings), interfering in ritual matters with the Nkandabwe people. This led to prejudice towards the resettled people. This together with the shortage of land caused so much tension that farmers at the irrigation scheme were fighting with each other causing damage to the scheme.

Further the report of the project adviser states that farmers were not prepared to repair their scheme and the Department of Agriculture did not show much concern

for the irrigation scheme. The annual report of the project adviser doubts very much that the self-reliance of the scheme, which was the aim of the GSDP, will be achieved. The report complains of the slowness of understanding the technical part of the scheme from the side of the farmers, and the indifference of the Department of Agriculture.

The Farmers' Executive Committee (FEC)

The first mentioning of a farmers' committee, the Nkandabwe Irrigation Committee, can be found for early 1974 but it seems this committee was established earlier than 1974. Apart from Chief Sinazongwe being the chairman the minutes of the meetings do not state how this committee was constituted and who the members were. Nevertheless, it was minuted that the farmers still have to improve with looking after their matters themselves, not always waiting until somebody comes to tell them or even does something for them. Water fee payment is a problem, thefts of crops as well. At that time 44 farmers were holding plots on 4.4 ha. The last minutes of 1977 of the Farmers' Meeting of Nkandabwe Irrigation states that the farmers should work harder and make an effort to look into their matters themselves since the scheme would be handed over to them soon.

Throughout the years until 1977 almost every minuted meeting is reporting on the low level of responsibility of the farmers for their scheme. No report or evaluation mentioned a suggestion for better advice or training to solve this problem. It was not even tried to find a reason for this attitude of the farmers, which was obviously astonishing and annoying for the various GSDP-advisers.

In 1978 a Farmers' Executive Committee (FEC) was elected. Its first business was a plot holders contract. This orga-

nisational set-up, though emphasized by the Department of Agriculture, never had a legal basis and actually never was a law for the management of irrigation schemes. The FEC was just accepted as an organisational body for the irrigation and as a link and negotiating partner between farmers and the Government.

Earlier in 1978 the dam of Nkandabwe Irrigation broke due to heavy rain and throughout 1978 it is reported that farmers were tremendously working on the repair of the dam. Because the GSDP adviser underestimated the water pressure approximately one month later the dam broke again. Farmers continued working at the dam until the GSDP had to assist financialwise since heavy machinery had to be hired to repair the dam to prevent the scheme from collapsing.

In 1981 the dam was repaired and raised and it seemed that the water problems were solved. By 1984 water shortage led to pumping and ever since a further hightening of the dam is in discussion.

Independence

The irrigation scheme was declared as independent from 1979 onward. Though a GSDP-adviser who was responsible for Buleya Malima Irrigation Scheme as well assisted the scheme and the FEC in some matters, the FEC was suppose to handle the irrigation matters themselves. An AA who was responsible for dryland farming as well was the only person to approach for agricultural matters.

It is reported by the farmers that the GSDP-adviser interfered with the irrigation management of the FEC to such an extent that the FEC more or less left matters to the GSDP adviser. The FEC members of that time reported that they feared to oppose to the GSDP adviser because

he was the only one who was able to get support for the scheme financialwise. Since his educational level was above the level of the FEC members they left matters for him to decide, thinking he would know better anyhow, enduring the interference.

Since 1984 the irrigation scheme was left without a GSDP adviser with only the FEC to run the scheme. Since the maintenance of the scheme requested little running costs and mainly labour in maintaining the canals and fences, the scheme was thought of being perfectly capable of managing on their own with the FEC as a management body. It was the "pride" of the GSDP, being the first irrigation scheme which gained independence.

Summary

Nkandabwe Irrigation being a resettlement programme in Federal times was the first irrigation scheme introduced in the valley. The starting condition affected the scheme already. The experience with the British Administration had left great suspicion with the Valley people. They never had experienced any public service given to them without some disadvantageous consequences. Everything new the British Administration introduced to them had been a disadvantage or a disaster so far.

The technique of irrigation was not known and no big effort was made to explain it to the people. Only the urgent need for land and food made very few farmers try this new method. When it turned out to be successful and no other demands were followed, more joined, seeing and experiencing the advantages of the new method. Still the technical set up of the scheme was not understood. The farmers did not understand why the water reached their scheme and why the main canal

has to have a height difference. They did not understand the principle of gravity-flow. Additionally they did not understand that a certain amount of water is enough for their crops and that it is not necessary to irrigation 24 hours per day. They did not understand that the water has to be given in applications to the scheme to safe the amount of stored water available for the dry season.

The experience of 1967, when a coal pit was more important than the cultivated land of the farmers, was a fall back into mistrust again. Nobody would take up the initiative to repair the system. Apart from not being able to do the professional work, the Nkandabwe people never learnt so far to be initiative for scheme matters like organizing mutual work and doing repairs without being told. Zambia was just 3 years old and people were still used to take orders rather than just do the necessary.

Therefore it should not have been very surprising that the Nkandabwe farmers just waited what their Government would decide.

Even after the scheme was repaired and rebuilt again all reports state that the lack of mutual responsibility and the weakness of the FEC's is a hinderance to the development of the scheme as such. This certainly was true, only: the Valley Tonga always were individual agriculturists. As the cassava-law with its imposed communal village garden already showed, the Valley people were never used to this kind of mutual work. The same applies for an irrigation scheme. The kind of dependency on each other and that they must coope-rate to become a well running irrigation scheme was not fully understood by Nkandabwe farmers, and, it never was explained to them.

From 1972 until 1979 they had advisers, technical and financial help from the GSDF, but the management of a scheme as such was never taught. Even the technical part was more or less installed, thinking that once it is running the farmers will be able to manage somehow. The result of these failures in understanding the background of these people and leaving them untrained technical- and management-wise is described in chapter 4.

Help for self-help only can work if the people have a chance to chose by themselves what kind of help they want for what kind of activities. In Nkandabwe the irrigation technique was introduced already and the new method of agriculture was experienced as a method that brought better living conditions. The conditions for introducing a new method of agriculture were almost perfect, no high technology, no high running costs, and only general agriculture know-how was involved. But the ones these new methods were meant for were presented with a set up they never have been involved to develop or never an effort had been made to teach them the importance of this method. The new managing system was not thought of as a problem for Valley people. A view back and into their social organization and educational history would have revealed that there would be problems that could easily be overcome if somebody would have cared to try to understand.

When the dam broke in 1978 evidence (see annual report of the GSDF adviser and information given to the researcher by Valley people) is given that the farmers did work very hard to save their scheme. They understood the importance of the dam and learnt by experience that cooperation is necessary and vital.

When it was experienced and understood cooperation, mutual work and feeling responsible was no problem anymore. Unfortunately it was never achieved by the farmers to

transfer this experience to other scheme matters.

3.2 Buleya Malima Irrigation Scheme

(The name Buleya Malima was given to this scheme because it is situated between the areas of the Buleya and the Malima clan.)

The Plan

With the resettlement programme of the Kariba Dam project many people from the Zambezi river side came into the Buleya and Malima area. After the first period of confusion, famines, and diseases that were caused by the resettlement, the Federal Government was discussing an irrigation scheme in this area, but it took until 1970 to actually implement these plans.

It was first to be thought of as an agronomical trial and research scheme for crop adaptability in the area. Approximately at the same time Siatwinda Pilot Irrigation Scheme was to be implemented and it was known that in Siatwinda the soil was poorer than in Buleya Malima. According to the information given to the researcher, Buleya Malima people as well as representatives of the local administration protested that the better soil should be for research and the less fertile soil for the farmers. This led to a reconsideration and Buleya Malima Irrigation was planned to be implemented by the Project Devision of the Ministry of Rural Development in three phases with the following set up.

Phase I : 26.8 ha were supposed to be used as a research site for one or two years.

Phase II : would be the extension of the scheme to an additional area of 80 ha where farmers should be settled on irrigation plots and trained in the techniques of irrigation.

Phase III: would involve the development of an area up to 5.600 ha with the use of information collected in Phase I and II.

The objectives of the scheme were:

- to compensate the people for the loss of land caused by the formation of the Kariba Lake;
- to provide a reliable source of more nutritious food to the people living in the Gwembe Valley;
- to intensify the use of the land to provide more food for more people;
- to provide the local population with means of possibilities to raise their standard of living;
- to ascertain which crops are best suited to the area from climatic, economic, and social viewpoints.

The water supply should come from the lake by pumps.

In 1977 the Project Devision handed the scheme over to the Agricultural Department, Choma. In 1979 the Provincial Agricultural Office proposed that Buleya Malima should be managed by the GSDP. The GSDP agreed and an adviser was seconded to the scheme.

The result

Between 1970 and 1977 trial work has been done in close cooperation with the Mochipapa Regional Research Station. It was planned that 41 ha should be given to farmers, each holding a plot of 0.25 ha (one lima) on the condition that

- the farmer undergoes a training on irrigation;
- that he/she cultivates his/her plot as follows:
 - 1 acre for food production for self use,
 - 1 acre for food production for selling,
 - 0.5 acre for fruit and vegetable production for self use.

Until 1979 no records are available which can explain the development of the scheme.

In 1979 the scheme was found to be 61 ha. 7 ha being used by the Government of Zambia (GRZ), mostly taken up by an orchard of fruit trees and 54 ha were allocated to settle

farmers. 40 farmers had been settled but only 10 of them actually cultivated their plots. Each of the farmers was given a plot of 1 ha and they had to grow on 0.2 ha vegetables and fruits, on 0.4 ha cotton/sunflower/beans, and on 0.4 ha maize (green). Water was pumped from the lake into a reservoir or directly into the irrigation canals.

No records are available or any explanation why the original plan was changed and what happened with the remaining 14 ha (54 ha were allocated for farmers, but only 40 farmers had been settled on a 1 ha plot).

The scheme employed 16 men, mostly for the maintenance of the water supply and the orchard. Only a scheme manager and an AA were supposed to be advisers for the farmers. It is stated that there was a farmers committee. The problems stated in 1979 are that the allocation of plots is not combined with binding rules, that many plots are abandoned, that the cooperation between the manager, the AA, the farmers' committee, and the farmers is very poor, that the scheme has severe water problems, that dryland farming is competing with irrigation farming during the rainy season, that the water management as a whole is non-existent. Nevertheless, the GSDP decided to make an effort to improve the scheme technically and management-wise. The GRZ promised to secure the funds.

The collapse

From 1980 to 1983 a continuous draught with the Kariba Lake receding lead to the collapsing of the scheme. Because of the Zimbabwean liberation war (in 1979/80) it was not possible for the project adviser to travel to the scheme (security measurements). The orchard dried up, the farmers had given up their irrigation

land because the irrigation system broke down completely in 1983.

In 1984 the Provincial Government finally stopped to provide the operational funds. In the same year new negotiations with the GRZ and GSDP started and it was agreed that the Gossner Mission through GSDP provides a project adviser and that the GRZ provides the rehabilitation funds.

The new start

The objectives were to rehabilitate the scheme and to get it self-reliant. It was agreed by the GRZ that she would cover rehabilitation costs up to a certain amount for two years, after that the scheme had to be self-reliant financial wise.

The restoration of the irrigation system had to be done and the restoration of the orchard as a supporting unit for the whole scheme was a major task.

The idea of the orchard as a supporting unit was that the income from this orchard should be the financial basis for the irrigation scheme. The surplus money from the orchard is put into a farmers bank account and all irrigation expenditure will be covered by that surplus.

The management

The management system was set up anew, but the biggest problem was the farmers' attitude towards the scheme. It was very difficult and took a lot of time and endeavour of the GSDP adviser to get them to work on their plots. The difficulties were mainly that the farmers always thought of the scheme as a Government scheme and nobody ever had seen any benefit from working for the Government. The imposed rules of what to grow,

the past water problems and the shown uninterest of Government representatives in the scheme never were able to encourage the farmers to work on the plots.

Since mid 1985 the scheme was run by the GSDP project adviser with the help of a Japanese volunteer (water engineer), a scheme manager and an AA who is assigned to the scheme and dryland farming.

The water supply was secured from the sump of the near by Nangombe river bed, water is pumped from this sump to the irrigation canals by an electric pump which is operated by a generator. 3 ha have been restored for the orchard and its profit made the scheme self-reliant by the end of 1986. 11 ha were developed for farmers but because of water problems only 5.5 ha can be cultivated.

All the technical set up, the budgeting and the handling of the financial matters are mainly done by the GSDP adviser with the water engineer and the manager.

The FEC

A new management system for the farmers was imposed on them in 1986. They elected a canal committee for each irrigation canal and a Farmers' Executive Committee for the whole scheme. The FEC is an assisting body to the scheme management and has no independent rights. Especially the financial handling is completely left with the management, the FEC is only to assist and approve or oppose.

Summary

The history of this scheme shows from the very beginning that the Department of Agriculture was not able to encourage the farmers to work for the scheme. Though some

training was provided the idea of the scheme was never really understood.

An evaluation report in the GSDP archives, unfortunately not dated and signed, but obviously written approximately 1976, states that irrigation techniques as implemented in Buleya Malima are thought of as appropriate for the farmers. The report describes that all work is done by Government paid workers and farmers just have to cultivate their plots. Though only 10 farmers are given plots and only two could be interviewed, an estimation of a high income is done, discussion in length the uneven distribution of income between dryland farmers and irrigation farmers.

This evaluation report shows that at that time the situation at Buleya Malima was completely misunderstood and wrongly estimated.

The estimated high income never was achieved by even one of the farmers. The evaluation does not survey or discuss reasons why farmers were not enthusiastic about their irrigation plots or why some did not cultivate their plots at all, though this must have been obvious already at that time.

According to the information given by Buleya Malima farmers to the researcher, even in 1986 a lot of the farmers had the impression that though plots were given to individual farmers, the land belongs to the Government and they would have to work for her. The early conditions of getting a plot, mainly the imposed rules of what to grow were very much in line with the Colonial/Federal Government for these farmers. There were introduction meetings in 1970 but a continuous work on introducing and explaining the method and the set up was never done. To make matters worse, the only, at least at times, prosperous part of the scheme, the orchard

was Government owned and all the profit went to the Government. (At that time the income of the orchard went to Government accounts directly. All financial support for the scheme was suppose to come from the Government in return.)

Up to 1984 the reports show that this scheme never was thought off as a scheme owned by the farmers. There were times when efforts were made to improve the technical set up, but it is never stated that an effort has been made to make the local people understand what the scheme really is intended to be for them. Ever since 1970 the history of this scheme reads like a half-heartedly, imposed, not very much liked matter the local people just endured rather than being very grateful and enthusiastic about it.

The real change only came in the end of 1985 when the pressure of the new GSDP adviser was brought to the farmers. The condition on which the GRZ provided the scheme with a two years financial support pressed the scheme management not only to rehabilitate the technical part, it also was vital to activate the farmers. And for the first time in the history of this scheme the technical part of the scheme worked so far. The social impact of the pressure by the GSDP adviser is described in Chapter 4.2 .

Here again two main facts are evident for the failure of the scheme until 1984 and the tremendous difficulties that arose for the rehabilitation in 1985. A training of farmers for the new agricultural technique was never done thoroughly and continuously (only 14 of them went to a short course for irrigational agriculture). A training for the new management set up for irrigation farming was never done.

The heritage of the Colonial/Federal Government and the experience the Valley Tonga had with Governmental authorities were not taken into account when the scheme started. The deeply rooted mistrust towards all imposed measures of agriculture led to a rather reluctant attitude towards the idea of the scheme.

With the money from the orchard being for the Government anyhow, it was even a proof for the farmers that nobody really wanted to improve their living conditions. As a result of the half-heartedly approach on the Government's side which did not really show much interest to encourage the farmers, the farmers did not care very much either. When the draught and the difficulties of the Zimbabwean liberation war came they even thought that they were proven right. It would have been a waste of time and labour for them, the scheme collapsed and that was it for them, just as they had experienced so many Governmental experiences imposed on them.

From 1985 with the new agreement they were pressed and pushed hard to work on their plots. They did not really understand the reason why it all mattered now and only the experience of the benefits of their plots actually made them work. When some of them had considerably large incomes from their crops and when it was clear that nobody had to give the profit away, others followed. Of course, there was struggle of paying the water-fees. For the farmers it still was a Government scheme, therefore the Government should provide the water and the money. To learn these changes in management set ups takes time, especially if the learning can be done best by experience. Only here, this time was not available. Two years are too short a time to get a scheme self-reliant financial and management-wise. Since the financial pressure was vital for the scheme the extension work, the training of the farmers, had to step back.

3.3 Siatwinda Pilot Irrigation Scheme (SPIS)

In June 1970 it was decided by the GRZ to start a Pilot Irrigation Scheme at Siatwinda. The Gossner Mission was asked by the Zambian Government to assist her by assigning an agricultural adviser to Siatwinda. The objectives of the scheme were:

- to find out the possibilities of irrigation for that area;
- to investigate crop adaptability for that area under irrigation by research;
- to improve the living conditions of the local people by providing a more effective method of agriculture.

The start

After the clearing of the bush under the supervision of an agricultural journalist in 1971, the actual trial and research work started. Pumps (diesel) were installed and the water was brought through pipes from Lake Kariba to the scheme site. By the end of 1971 the SPIS covered 32 ha, 24 ha thereof were given to farmers as land they can cultivate individually, 5 ha were for research trials, 3 ha were used as demonstration fields. A Selection Committee for distributing the plots to farmers was founded, consisting of a representative from the Ministry for Rural Development, the District Govenour, the Provincial Agricultural Officer, the Gossner Mission adviser, Senior Chief Mweemba, and the village headman of Siatwinda.

At the planning stage of the SPIS it was a principle that the set up of the scheme should be done by the local people as much as possible. It would enable those who worked on the set up to learn the technical part of it and maintain it in the future. This principle was dropped during the set up period and heavy machinery and a large paid labour force, recruited from the area was used to set up Siatwinda. Workers were paid by the hour and had the impression that this was a Government

project with which they can find employment later on. As a result it took farmers a long time to understand that they have to work on their plots at their own risk. (see F. Bredt, 1981; H. Büchner, B. Matthes, 1986)

Already in the annual report of 1971 it was realized that Siatwinda had been brought into being by a tremendous amount of technical, financial and advising help and the local farmers hardly could follow. Already then it is stated that the farmers realized that help for their situation is not in their own limits, the SPIS just had shown it to them that heavy support from outside is their solution, only. The annual report of 1971 realizes this mistake without knowing a way out since it was done already. The approach from now on was meant to be that the farmers should not be discouraged and should learn how to handle the technical and management set up as to understand that this scheme is not something far beyond their limits.

The change

The management was done by a Zambian manager who was supported by a project adviser who was responsible to the GSDP. In 1972 a farmers' committee was founded and the manager post was abandoned. The project adviser was now the adviser to the farmers' committee, a second GSDP member was responsible for the research section. Farmers were trained on their plots and on the demonstration plots, once per week they had theoretical lessons.

From 1972 until 1975 the SPIS experienced a remarkable change. The first year farmers were very successful agricultural wise on their plots. This year was followed

by tremendous difficulties to get the farmers to work on their plots. Out of 40 farmers in 1973 only 13 were active. The GSDP blamed the management, laziness of the farmers, the inappropriate teaching of irrigation farming, and the difficult land-ownership question for this failure. In Zambia land is generally owned by the Government (the President), and the chiefs are acting on behalf of the President for certain parts of the land in their chieftaincies. Usually land is given to individuals to make use of it. At an irrigation scheme which as a whole was approved by the chief and where individuals were given parts of this land to use the question of landownership was to be found very difficult to sort out and to be understood by the farmers.

In 1976 the GSDP project adviser already realized that these were not the real reasons for the difficulties at Siatwinda. He states that the farmers did not trust the set up, believing that the Government will take away the land as soon as it is prosperous. Old customs, like land/shrine/burying place traditions had not been taken into account and therefore some plots could not be worked on. In Tonga culture it is not allowed to cultivate land where it is known that somebody is buried there. It is even more impossible to cultivate land where an important person who was a religious leader is buried.

The GSDP adviser experienced that the employment the scheme provided was much more important for Siatwinda people than the plots themselves. None of the farmers were worried about the economical situation of the scheme. They had experienced the heavy input and expected it to go on like that.

The FEC

From 1976 this was taken into account and a slow approach was done to get the farmers to identify

managing their own affairs in order to be accepted as a management body by the farmers. But all this was done in a careful manner, always leaving the decisions to the FEC themselves. The results of this approach are stated in chapter 4.3 .

Summary

The history of Siatwinda Pilot Irrigation Scheme is quite different from the histories of the other irrigation schemes. While Nkandabwe and Buleya Malima irrigation started as resettlement programmes and as a half-hearted approach to improve the living conditions of the people, Siatwinda's starting conditions were almost the opposite. Of course, it is understandable that a developer always wants to do the "best", but Siatwinda shows that the "best" sometimes is very double edged. The heavy investments, the high technical support by setting up Siatwinda, the incredible amount of labour force used (up to 100 men at times) and paid by the GRZ completely undermined the self-reliance and motivations of the local people.

During the years when Government funds were ceasing, Gossner Mission funds replaced the lack of financial help. The farmers in Siatwinda have always experienced that if financial or technical problems arise, somebody will step in. The first years of setting up the irrigation scheme were the worst experience for that matter. Here technical methods were used which were far beyond the imagination and reach of the farmers. Apart from other mistakes that had been made, like neglecting the traditional and cultural background, these first years were hard to make up for. Only because the agricultural adviser of the GSDP realized this early enough, a different approach could soften the impact of the damage. Though much work was done to get the farmers to organize themselves, funds and the technical supervision were always

provided and secured by the GSDP and/or Gossner Mission. The justification for providing these funds still is, that Siatwinda is a pilot irrigation scheme and its economical self-reliance is not the main objective. For almost 14 years, with some interruptions, emphasis was put more or less (depending on the different scheme advisers) on the strengthening of the managing body, the FEC. Only the economical part of the scheme never was a real matter of consideration for the FEC. Project funds were always handled by the GSDP advisers and the scheme never was expected of producing some kind of profit because of its pilot character.

3.4 The legal position of the irrigation schemes and their Farmers' Executive Committees

The GSDP is a cooperation between the Government of Zambia and the Gossner Mission of the Federal Republic of Germany. All three irrigation schemes are project components of the GSDP. The GSDP has seconded per terms of reference GSDP advisers to two of the irrigation schemes (Buleya Malima Irrigation Scheme, Siatwinda Irrigation Scheme). These advisers are responsible to the GSDP staff-meeting and the Co-ordinator of the GSDP. The Agricultural Assistants seconded to the schemes by the District Administration are responsible to the GSDP staff-meeting and the GSDP Co-ordinator as well. It is the aim of all irrigation schemes that a FEC should manage their scheme in the future. So far these FEC's have no legal status and their responsibility for certain scheme matters are either taken up by committee members and agreed upon by the farmers or were given to them by the GSDP adviser.

Since it is the future aim that these FEC's should manage their scheme, Government representatives very often address the FEC as the management body responsible for their scheme though this responsibility never actually

was given to them.

The members of the FEC of an irrigation scheme are elected in a Genral Meeting, a meeting where all farmers of the scheme are invited and those present elect the members of the FEC as their representatives. According to the statements of the GSDP Co-ordinator and GSDP staff-members all duties of FEC members are agreed upon verbally. The duties of the FEC members are as follows:

The chairman and his/her vice as an assisting and/or acting chairman has to call FEC-meetings regularly and General meetings at least once a year or when it is thought to be necessary. He/she has to chair these meetings. The chairman is the representative of the FEC and is the one to refer to if the scheme is visited by Government Authorities.

The secretary and his/her vice as an assisting and/or acting secretary has to write invitiations for meetings and has to present them to the FEC for confirmation. He/she has to keep all records of the irrigation scheme and the FEC.

The treasurer and his vice as an assisting and/or acting treasurer has to keep records of all financial matters that are left to the FEC to handle. He/she has to present these records on demand, has to keep irrigation/farmers money safely, and has to present this money or a bank-statement on demand. All payments of the farmers to the FEC is only allowed to be accepted by the treasurer or his/her vice. For all payments receipts must be given with a copy for the records of the treasurer. For all expenditure receipts must be kept.

The duties of the trustee members are to assist the FEC. This assistance is not specified.

4. THE PERFORMANCE OF THE FARMERS' EXECUTIVE COMMITTEES

In December 1986 the researcher visited all three irrigation schemes to get familiar with the schemes and its farmers. The first approach to the FEC's was done in January 1987 when the researcher attended FEC-meetings as an observer only. Always a GSDP staff member was present and introduced the researcher, giving her time to explain her work and intention always pointing out that a survey was done and no promises for improvements or changes can be made. After this first period of introduction the researcher called for her own meetings.

Nkandabwe Irrigation Scheme has an AA seconded to the scheme who is responsible to the GSDP staff-meeting and the Co-ordinator of the GSDP.

Buleya Malima Irrigation Scheme has a GSDP adviser, a manager, and an AA seconded to the scheme. The AA is responsible for dryland farming as well. Only the GSDP adviser and the manager are responsible to the GSDP staff-meeting and the GSDP Co-ordinator.

Siatwinda Irrigation Scheme has a GSDP adviser and an AA seconded to the scheme, both are responsible to the GSDP staff meeting and the GSDP Co-ordinator.

4.1 The Farmers' Executive Committee of Nkandabwe Irrigation Scheme

Nkandabwe Irrigation is financially self-sufficient. Only technical assistance and, if needed, technical equipment (pump) is given by the GSDP workshop. The farmers pay K 5,25 water fees per year since 1983. In 1987 the water fees were raised to K 15,--. This is the only source of money for maintenance for Nkandabwe Irrigation.

The FEC is responsible for the management of the scheme since 1979. Though the researcher was told that Nkandabwe Irrigation has a constitution, nobody was able to present this constitution or tell the researcher what was part of this document.

The scheme has 86 farmers and is electing the FEC once a year. The members of the FEC are:
one chairman, one vice-chairman,
one secretary, one vice-secretary,
one treasurer, one vice-treasurer,
two trustee members.

When the researcher inquired about the next meeting of the FEC in January 1987 she had to learn that during the last year only one meeting was held. Farmers complaints about the deterioration and non-functioning of the FEC made the Co-ordinator of the GSDP call for a FEC meeting, pressing the urgency of the matter.

This meeting was held in February, only the chairman, the secretary, and the treasurer attending it. When it was proven that the treasurer had misused the money a General Meeting in March 1987 dissolved the FEC.

The researcher was told by the farmers that the attitude of all FEC members except for the secretary was that a FEC is a management body which is rather useless since it has neither the strength to decide irrigation matters nor is the FEC accepted by the farmers as their management. Therefore, individuals negotiated some problems in a rather family manner than trying to get the FEC working. Urgent problems of the scheme have been neglected for approximatly two to three years. Already at the first meeting it was clear to the GSDP representative as well as to the researcher that the FEC of Nkandabwe Irrigation only existed on paper. The management was non-existent. This resulted in serious problems for the scheme since water problems

could only be solved temporarily and with the initiative of the secretary. Water fees had not been paid for almost four years, and the maintenance work at the scheme was neglected.

Apart from the chairman, the secretary, and the treasurer of the FEC the researcher was not able to meet any other FEC members. She was told that presently most of them are employed by private companies and had no time for irrigation matters anymore. Some were in the hills or at funerals. In ten weeks non of these FEC members felt it their duty to at least get informed why the GSDP had called them.

The chairman could not be interviewed according to the questionnaire (see appendix 1) because he thought himself in a situation where his fellow committee members and some farmers want to "punish" him, because he had settled problems of plot ownership with some irrigation members individually. He felt no fault in doing so. He only complained that the treasurer of the FEC did not give a financial report. Any other information he did not like to give, thinking it only would be used against him.

According to the information the researcher had from farmers, the chairman settled plot ownership problems with his vice-chairman, not meeting with other FEC members.

The fact that during 1986 only one FEC meeting was held, that scheme problems were not attended to (see later), it seems that the chairman of the FEC really did not work as a chairman. Whether he did not know his duties or just acted as he wanted to cannot be evaluated.

The secretary was interviewed according to the questionnaire (see appendix 1). He was thoroughly aware of his duties, the situation of the scheme, the present problems. He suggested some solutions for improving the FEC and the scheme. He pointed out, that the scheme in general and the FEC in specific need support from the GSDP staff for a while to get used to a proper management set up again. He personally needs support, since he is doing all FEC work himself and attends to water problems as well. For his actual secretarial work he states that he has no problems and could do fine if he would have to do this, only. He stated that the farmers do not really take the FEC serious. Farmers only have a vague idea that a FEC has to be elected, but neither respect this as a management body nor accept decisions made by the FEC. But this was not always like that. It became like this from approximately 1983/84 onward.

The secretary was very vague about the assistance of the AA. He told that he knows that the AA is not suppose to do FEC's work and that he does assist when he is asked for. The way the secretary answered, he left the impression to the researcher that he would like the AA to be more active in advice and controlling the duties of the FEC.

Though the secretary is able to write minutes, he has difficulties to express himself sufficiently in English for the minute-writing, especially the spelling in English is a problem to him.

Looking at his "files" the researcher realized that his filing system has to be improved. He is keeping FEC records in a file and only he himself will be able to find something in there. He is not well trained in what really has to be in FEC files, he only keeps documents

he was given to keep and his own minutes, invitations, and agendas of meetings.

Though the secretary was able to inform the researcher about all scheme matters and problems, it was obvious that he worked more or less on his own, without involving the other committee members. Because of the experience of the last years it is understandable that that he does not want to waste time anymore to get the FEC working properly. His proposals for problem solutions are very vague, he only knows that something has to be done fast.

His actual secretarial work is sufficient, though it could be improved.

Nevertheless, he feels responsible for the scheme and knows that it needs a lot of training and support to enable the FEC to manage their scheme.

The researcher tried to interview the treasurer according to the questionnaire (appendix 1) several times, but gave up and interviewed him in an open interview only. Even then the treasurer did not answer questions clearly. He could not give a clear statement of the financial situation of the scheme. It is doubtful to the researcher that he really did not know about his duties.

In the beginning of March 1987 it was proven that the treasurer had misused almost all the money of the irrigation scheme (more than K 1,000.00) and had to be forced to pay it back. Asked why he was able to misuse money unnoticed by other FEC members for more than a year, he answered that the AA has to be blamed for it, since he never checked the books. When the treasurer was advised that it is not the duty of the AA to check the books and if he thinks he only had misused money because he was not checked, he answered, again evasive, that he needs training in book-keeping.

That indeed he would need. His "book-keeping" was a collection of receipts, one receipt-book, various pieces of

paper with notes, only he knew what they meant. It were the secretary of the FEC, the chairmen and the AA who prepared the financial break-down for four years for him.

Because of the dishonest money-handling of the treasurer, his capabilities, his attitude towards his FEC membership and towards the scheme could not be evaluated.

In March 1987 a General Meeting was called to decide about the present FEC. Only 26 farmers (out of 86) attended this meeting. They were already mistrusting meetings to such an extend that most of them did not find it worthwhile to come. Nevertheless, the FEC was dissolved because of its malfunctioning and an election meeting was to be held soon.

It took two months until a meeting was arranged. Only 41 farmers were present and a new FEC was elected. The election was dominated by the ward-chairman who is a farmer of Nkandabwe irrigation as well. Though the former secretary was clearly in favour of getting the chairman's post now, the ward-chairman told his fellow farmers that he has to stay secretary because nobody else can write minutes, which is not true.

However, the farmers did elect how they were told to and the secretary of the former FEC stayed secretary for the new FEC.

After the election meeting in May 1987 the researcher held her own meeting with the new FEC and 7 members came. The one who could not attend this meeting was the secretary. The FEC members were interviewed according to a second questionnaire (see appendix 2).

From earlier interviews and experiences it was very clear to the researcher as well as to the members of the FEC themselves that the secretary was the only one who really knew what was expected of the FEC as a whole and of each

member specifically. All seven interviewed members had doubts whether farmers would trust them, all were obviously very worried how to manage their FEC duties. Therefore, they were advised not to hesitate to ask the GSDP-Co-ordinator and the researcher for help if they wished help.

The AA was interviewed in an open interview several times. He clearly stated that he is responsible for the agricultural side of the scheme. He neither is able to manage the water supply, nor is he able to assist farmers with the attendance to the pump (observation of the researcher). His extension work is a rather vague advice to FEC members. His feeling towards the present FEC is that the wrong people have been elected and that he is not able to succeed in guiding them. But he clearly states that he is and always will be in the position of an adviser only and never takes any actions that his advice is carried through, even if it is badly needed.

The only GSDP member who was familiar with the scheme was interviewed in an open interview. He was very doubtful about the FEC and its management role. Though all effort possible was made from his side, to make farmers and the FEC understand the seriousness of the matter, he was not very optimistic about the near future. The only solution he could see was, that Nkandabwe irrigation gets a short term assistance from the GSDP staff to train the FEC for its duties. He was clear and frank about his judgement of Nkandabwe farmers: they want to do something, but do not know how; about the FEC: they do not take things serious.

In June 1987 19 farmers (22 %) were interviewed according to a questionnaire (see appendix 3). The result of the interviews is stated in Table 1, page 63. Only one of the interviewed farmers knew some of the FEC work, all the

Table 1

Nkandabwe Irrigation Scheme - Result of farmers interviews according to the questionnaire, see appendix 3

The percentage of the interviewed farmers, female, male is referred to the total number of farmers (86 = 100 %).

The percentage given for the questions is referred to the number of interviewed persons (19 = 100 %)

Interviewed farmers: 19 (22 %)

thereof female : 9 (11 %)

thereof male : 10 (12 %)

1. Did know of the FEC	7 (41 %)
2. Had vague idea about FEC work	8 (42 %)
3. Knew FEC work	1 (5 %)
4. Thought FEC is needed	7 (37 %)
5. Knew the link to GSDP	0
6. Did know how much he/she earned from the plot last year*)1	7 (41 %)
7. Could read a scale	11 (11 %)
8. Did know how many grams are in one kg	1 (5 %)
9. Could multiply prices	9 (47 %)
10. Could identify Kwacha notes	13 (68 %)
11. Could work out change*)2	5 (26 %)
12. Did know how many ngwes are in one Kwacha	3 (16 %)

*)1 here only 17 interviews could be taken for data analysis; 17 = 100 %

*)2 those who still counted in Pounds and could work out change in Pounds and Shillings are included here

rest had either very vague ideas or did not know that there was a FEC at all.

There was none who knew that the FEC is the managing body for their scheme and none knew that this committee could be approached for help.

The educational level of the farmers is very low (only 5 could work out change etc., see Table 1, page 63). It was remarkable that 42 % of the interviewed farmers were able to state the amount of income they had from their plots. That the statements given for the income could be the actual income of these farmers could only be assumed by comparing the statements and by estimating the approximate income according to the agricultural performance of the farmers. No records are available about the income of the farmers. That the farmers could state their income is very much related to the measuring system of volume measurements (buckets) the farmers can deal with. (In Nkandabwe Irrigation buckets are used for measuring the amount of crop harvested instead of a scale.)

The result of the interview sequence of the farmers in Nkandabwe Irrigation:

- the farmers have only a vague idea about the FEC, if at all;
- the farmers neither understand the management system nor know anything about the link to the GSDP;
- the educational level is extremely low (for the researchers point of view).

The situation of the scheme

The agricultural performance of the scheme is fairly good. The maintenance of all canals and the fence is very poor, thefts in the scheme are not followed up. The scheme has an unfurnished room for the farmers and the FEC. This room, because it is not furnished is never used as a meeting place. The FEC is coming to the GSDP office

block (3-4 km away from the scheme) for meetings. Because there is no room with office equipment all records of the FEC are kept at the private houses of the FEC members.

Summary

The FEC in Nkandabwe Irrigation Scheme is a non-functioning committee. It is hardly known by the farmers and does not understand its role as a management body.

4.2 The Farmers' Executive Committee of Buleya Malima Irrigation Scheme

Buleya Malima Irrigation Scheme has an income from its supporting unit, the orchard. The surplus of this orchard is covering the expenses of the irrigation scheme.

The management set up was worked out in 1986 by the GSDP adviser and the General Meeting of the farmers accepted it in November 1986. The set up is as follows:

The 54 farmers have their plots along the sides of three canals. All farmers who have plots on one canal are electing a canal committee for their canal with a chairman, a treasurer, a secretary, and two members. According to the constitution the responsibilities of these three canal committees are:

- "- to collect water charges of their canal members and hand these fees to the scheme manager;
- the control of water distribution;
- keep records of irrigation hours;
- keep the canals clean;
- to expell farmers from the scheme, if they think it is necessary;
- provide service for the supporting unit (orchard);
- assist the management in any way."

(see constitution of Buleya Malima Irrigation Scheme, 1986)

All farmers elect a Farmers' Executive Committee with a chairman, a vice chairman, a secretary, a vice secretary, a treasurer, a vice treasurer and four trustee members. The Chief Administrative Officer of the Sinazongwe Subdistrict and the Chief Sinazongwe are the honorary permanent members of the FEC with voting rights. The responsibilities of this FEC are stated in the constitution as follows:

- "- approve any development plan for the scheme;
- approve every year's budget and financial plan;
- meet quarterly to discuss progress and problems;
- assist management staff in every exercise wherever necessary."

(see constitution of Buleya Malima Irrigation Scheme, 1986)

The canal committee is the overall decision making body for all water management affairs in its area of action. FEC members have to follow these decisions of the canal committee.

The manager of the scheme has the following responsibilities:

- "- general management of the scheme;
- keeping books and accounts in order;
- management of the supporting unit with two general workers;
- preparation of the budget and financial plan for the year;
- collection of water fees from the canal committees and banking it;
- making arrangements for buying diesel and lubricant for running of the irrigation in time;
- keeping contact with the sister organisation (GSDP etc.) for any assistance;
- submit quarterly progress report to the committee as well as a copy to the PAO's office."

(see constitution of Buleya Malima Irrigation Scheme, 1986)

Especially for all financial matters the manager has to have the approval of the GSDP adviser. According to the constitution the FEC is not the controlling or managing body of the scheme. This is the manager and the GSDP adviser.

The first FEC meeting where the researcher was introduced took place in March 1987. During this meeting the researcher observed already that all FEC members hardly understood any financial and budgeting matters on the agenda. Though the budget for 1987 was explained to them by the GSDP adviser and the chairman, the secretary, and the treasurer signed it as agreed upon by the

the FEC, the researcher had the impression that the committee members only agreed because they were told to do so.

For the water management matters the FEC members were more interested and discussed problems which showed that they understood the problems. The meeting was called by the GSDP adviser who prepared the agenda and, though not officially, but factual, chaired the meeting. The manager prepared the budget with the GSDP adviser. The minutes of this meeting were written by the GSDP adviser, though the secretary of the FEC took the notes.

During March 1987 the researcher held several meetings with the FEC on her own and five FEC members were interviewed according to the questionnaire (see appendix 4). The results of these interview are given in Table 2, page 69.

There were no books, files, records to look into for the researcher since all the record keeping was not done by the FEC. It was obvious that the FEC members did neither understand the function or meaning of the FEC, nor did they know what they actually had to do. This complete not-understanding results in a very reluctant attitude towards all scheme matters. Since decisions are made without the FEC anyhow, meetings are only held for the FEC to approve decisions, the FEC members see no point in making an effort to try to understand more of their scheme, not to speak of really doing some of the management work.

The GSDP adviser was interviewed in an open interview. According to his statements the management can by no means be left in the hands of the FEC, not for any part of it. Since Buleya Malima has to be self-reliant financial wise the scheme cannot afford any risks, neither

Table 2

Buleya Malima Irrigation Scheme

Result of interviews of the FEC members according
to the questionnaire, see appendix 4

Total number of FEC members: 9

FEC members interviewed: 5

1. Did understand the management set up:	1
2. Did know his duties in the FEC and his special duties according to his membership:	0
3. Was informed about the scheme situation:	0
4. Did know of the GSDP:	0

educational level:

5. Is able to read a scale:	1
6. Knew how many grams are in one kg:	1
7. Could identify K-notes:	4
8. Knew how many ngwes are in one Kwacha:	2
9. Could multiply prices:	4
10. Could work out change:	3

technical, economical, financial, or management wise. That is why the management set up was done like it is now. In the opinion of the GSDP adviser the FEC needs a long and regular on-the-job training, but even then he doubts whether the FEC will be able to take over. His main aim is, to get the FEC members trained enough that they will be able to assist the management staff. In his opinion the difficulties lie in the election of the members. Farmers elect people they trust, those do not necessarily have to be the best educated or trained ones. Therefore, the GSDP adviser states, it is justified that he will be the main decision making person, together, for some matters, with the manager of the scheme. If time allows an on-the-job-training, the FEC members will get things explained by the manager. The scheme manager needs a lot of training for the financial management, too. Therefore it will take some years until the FEC members will be able to fulfill their duties they have now. For the FEC to take over the management could be a future aim, but for the time being, the management set up has to stay like it is. There is no other solution.

The link to the GSDP the GSDP adviser sees as a protection for the scheme. As long as the scheme is not self-reliant in every aspect it needs a link to an organisational set up.

The manager of Buleya Malima Irrigation was interviewed in an open interview. His opinion of the FEC is that all members have neither the appropriate education, nor do they understand the meaning of management. Since some of the farmers and few FEC members understand vaguely that the FEC could be an organisational body that could achieve power in the future, already some mistrust towards the FEC is creating some problems. For the manager there is no doubt that only a thorough training of all FEC

members will be the solution for them. This training has to start soon and has to be very regular, otherwise the set up and the financial involvements of the scheme are getting too advanced and no FEC member will be able to catch up.

The manager has experienced that farmers and FEC members learn best by experience, by seeing results, therefore, they have to experience that they are needed. That will give them a motivation to work harder.

The manager is appreciating the cooperation between the GSDP adviser and the AA. He sees no difficulties and problems in the management set up. The link to the GSDP he sees in the technical help for the workshop, only.

The AA was interviewed in an open interview. He is the one who is closest in touch with the FEC and the farmers. (Some of the farmers regard him as the manager.) Though he states that his duties are the agricultural advice to the farmers, only, the researcher observed, that he is doing the only extension work at the scheme. He explains the management set up to farmers and FEC members, tries to help FEC members to understand their duties and very often is their link to the manager and the GSDP adviser.

The AA is not a member of the GSDP staff, but states that he has to be. He sees the need for it because he has no opportunity to get informations otherwise. His opinion of the FEC is that the training and constant working together with them will lead to a strong FEC soon. The only problem he sees is, that there is nobody who really does the training.

The farmers were interviewed according to the questionnaire (see appendix 5) during May 1987. The results are given in Table 5, page 72.

Table 3

Buleya Malima Irrigation Scheme

Result of farmers interviews according to the questionnaire, see appendix 5

The percentage of the interviewed farmers, female, male is referred to the total number of farmers ($54 = 100\%$).

The percentage given for the questions is referred to the number of interviewed persons ($21 = 100\%$).

Interviewed farmers: 21 (39 %)

thereof female : 9 (17 %)

thereof male : 12 (22 %)

1. Knew the management set up	1 (5 %)
2. Did know the FEC	18 (86 %)
3. Knew the duties of the FEC	0
4. Did know of canal committee	21(100 %)
5. Knew the duties of the canal committee	0
6. Knew the link to GSDP	0
7. Did know how much he/she earned from the plot last year*)1	10 (63 %)
8. Could read a scale	4 (19 %)
9. Knew how many grams are in 1 kg	1 (5 %)
10. Could multiply prices	13 (62 %)
11. Could identify Kwacha notes	11 (52 %)
12. Could work out change*)2	6 (29 %)
13. Did know how many ngwes are in 1 Kwacha	7 (33 %)

*)1 here only 16 interviews could be taken for data analysis; $16 = 100\%$

*)2 those who still counted in Pounds and could work out change in Pounds and Shillings are included

The agricultural performance of the scheme is good. All matters of mutual work are followed up by the manager and the AA, the FEC members are only assisting in passing informations.

Summary

Since the management set up of Buleya Malima Irrigation Scheme does not allow that the FEC is the management body for the scheme, its effectiveness can only be compared with their duties according to the constitution. The interviews with the FEC members and the observations showed that the FEC members neither have understood the management set up, nor do they know their duties. For at least one FEC-member (treasurer) it is very doubtful if he would be able to fulfill these duties, even if he would know them. The FEC members interviewed were far from understanding the consequences of the management set up they had agreed upon in November 1986. That this set up will never allow them to be the management and decision making body of their scheme nobody realized.

Only one of the interviewed farmers had an idea about the management set up. None of the interviewed farmers knew the duties of the canal committees or the FEC. The educational level of the farmers and the FEC members is very low, see Table 2 and 3.

4.3 The Farmers' Executive Committee of Siatwinda Pilot Irrigation Scheme

Siatwinda Irrigation Scheme is supported financially by the GRZ and the Gossner Mission of the Federal Republic of Zambia.

Siatwinda Irrigation has 16 farmers who elect their FEC every two years. The members of the FEC are one chairman, one vice-chairman, one secretary, one vice secretary, one treasurer, one vice-treasurer, and three trustee members. The FEC is the decision making and management body for all scheme affairs under the guidance of the GSDP adviser and the AA. Decisions about the technical set up and maintenance are mainly done by the AA and the GSDP adviser themselves. The regular maintenance of the pumps and records of pumping hours are done by pump attendants, the AA and the GSDP adviser. All budgeting and financial matters are done by the GSDP adviser and the AA except the collection of water fees and payments for agricultural inputs.

The researcher was introduced to the FEC on a meeting in February 1987. The GSDP adviser was present and took part in the meeting. The first impression of the FEC was, that they are very much aware of their position. All matters of plot distribution were handled and decided by them, the GSDP adviser was only giving his comment when asked. During February and March 1987 the researcher held her own meetings and interviewed seven FEC members out of nine members according to the questionnaire (see appendix 6). The results of these interviews are given in Table 4, page 75.

The FEC of Siatwinda Irrigation was very much aware of the shortcomings of their work. The aim, the FEC stated, was that they want to be registered as a cooperative. All stated that they feel far from being able to work as an Executive Committee of a cooperative. But they

Table 4

Siatwinda Pilot Irrigation Scheme

Results of the Farmers' Executive Committee interviews according to the questionnaire, see appendix 8

Total number of FEC members: 9

Number of FEC members interviewed: 7

1. Did know the GSDP*)	3
2. Did know the link to GSDP	1
3. Did know his/her duties in the FEC	4
4. Was informed about scheme matters	7
5. Record keeping was sufficient (total number of interviewed persons to whom this referred = 5)	3
6. Was aware of problems of the FEC in general	7
7. Was aware of the ineffectiveness of the FEC	7
8. Was aware of his/her own disability to do FEC work	7
9. Had problem solution proposals and was initiative about im- provements	5
educational level	
10. Is able to read the scale	3
11. Knew how many grams are in one kg	1
12. Could identify K-notes	7
13. Knew how many ngwes are in one Kwacha	2
14. Could multiply prices	5
15. Could work out change	4

all were somehow helpless how to improve their work. All stated that they need guidance, training, and much more information about their scheme. Apart from the trustee members all of them are working long hours for the scheme. Especially the treasurer seemed to be overloaded with his book-keeping.

The book-keeping system, though done precisely and accurate, is a tremendous, time consuming effort. From every sale of each farmer a third is deducted and entered as part of the water-fee payment of this farmer. To keep a record for '6 farmers, who sometimes sell their crops in little amounts, until K 130,-- per farmer is paid off is such a tremendous work. Therefore, it is not at all astonishing that the treasurer is overloaded with work.

Though the actual work the FEC is doing is organized and everybody is trying to do their best, it was not sufficient for a management body. The difficulty here lies in the introduction of technical and financial matters to the FEC. Most of the members knew that they need to learn and get informed about these matters, but it was never introduced to them. All statistical data is kept by the AA and all technical and financial matters are done by the GSDP adviser. The collection of water fees and the selling of seeds and fertilizers are the only money handling matters done by the FEC.

The record keeping that was left to the FEC was sufficient. It has to be improved, especially the completeness of the records. The minutes are written in English by the secretary and were sufficient.

The chairman of the FEC has a special attitude about his chairmanship. He is convinced that he has to make the decisions and the other FEC members have to follow. He thinks it is his task to convince the FEC members about the rightness of his decisions.

During the time of the interviews the researcher was able to observe that the FEC has a major problem of keeping family matters out of the irrigation management. Though they tried hard, they were not able to manage. When decisions had to be made about plot distributions, family matters, felt obligations towards relatives hindered the work of the FEC.

The role of the AA according to the interviews is very questionable but must be seen as a result of the difficulties at that time. Though the agricultural part of the AA was well accepted, his attitude towards the FEC caused complaints and the researcher had the impression that a kind of power game was starting. The FEC knows very well that some decisions only they can make, whether the AA likes it or not. On the other hand the AA knows very well that he has advantages in education and can use his knowledge and connections to the GSDP. In general it seemed that at the time of the interviews the situation had accelerated a bit and is much better most of the time.

The GSDP adviser according to the interviews is accepted as the one who really is able to run the scheme in all aspects. It was appreciated that he never interfered or tried to push his ideas of decisions through. But the FEC member were aware of it that the GSDP adviser could have involved them much more in his work, especially with the financial part of it.

The AA was interviewed in an open interview. He was very optimistic about the FEC and expressed a lot of hope for further improvements. Of course, he reported some misunderstandings, but he was taking it as a short term difficulty. In his opinion the FEC was very effective and he was proud of "his" committee.

His attitude towards the training of the FEC members was very vague. The researcher had the impression that he actually would not know how to train them. He felt that his duties are the agricultural side of the scheme and the extension work with the farmers. What he called extension work was a very precise and up to date record of each farmer and his activities, crop production, and selling.

The GSDP adviser was interviewed in open interviews several times. He expressed a lot of hope for the FEC, but was by no means impressed by their effectiveness. He knew the problems and was aware of his "failure" to work more intensively with the FEC members. He stated that he would like to do much more training and that there is an urgent need for it, but that time is not allowing it.

The impression the researcher got from the interviews and the observations during meetings of the FEC with the GSDP adviser was that he has a very sensitive way of guiding the FEC without imposing any advice on them. This approach made the FEC members aware of their inability and due to this guidance the FEC members know very well that they are not able to manage their scheme.

Between March and May 1987 the farmers were interviewed according to the questionnaire (see appendix 7). The results of these interviews are shown in Table 5, page 79.

In Siatwinda the farmers bring their harvest to a room where it is weighed and, if possible sold by various means (a lorry brings the vegetables to the towns or private marketeers buy it). From the sale of these goods a third is deducted for water fees for so long until the total amount of K 130,-- is reached.

Table 5

Siatwinda Pilot Irrigation Scheme

Results of the farmers interviews according to the questionnaire, see appendix 7.

The percentage of the interviewed farmers, male, female is referred to the total number of farmers ($75 = 100\%$). The percentage given for the questions is referred to the number of interviewed persons ($31 = 100\%$).

Total number of farmers	75 (100 %)
Number of farmers interviewed	31 (41 %)
Thereof female	16 (52 %)
Thereof male	15 (48 %)
1. Did know of the FEC	25 (81 %)
2. Knew vaguely some work of the FEC	15 (48 %)
3. Knew the work of the FEC	1 (3 %)
4. Knew the GSDP/were referring to "Gossiner"	2 (7 %)
5. Knew the link to GSDP	0
6. Did know how much he/she earned from the plot last year*)1	4 (14 %)
7. Could read a scale	5 (16 %)
8. Knew how many grams are in 1 kg	3 (10 %)
9. Could multiply prices	17 (55 %)
10. Could identify K-notes	19 (61 %)
11. Could work out change*)	11 (36 %)
12. Knew how many ngwes are in one Kwacha	8 (26 %)

*)1 here only 28 interviews could be taken as data basis, therefore $28 = 100\%$

*)2 those who still counted in Pounds and could work out change in Pounds and Shillings were included here

Due to the low level of education neither farmers nor the committee members know how to work out the exact prices per kg and grams. Therefore, even if a farmer has more than for example 1 kg of vegetables, say 1.4 kg, this farmer gets paid only the price for a full kg. Most of the farmers cannot read the scale, not to speak of knowing the difference between grams and kg's. Therefore, all farmers lose tremendously because they do not know that they are entitled to either a higher price or can take off the surplus weight.

Since the beginning of the year the scheme employed a sales assistant who is making a tremendous effort to milder these disadvantages for the farmers. She is very much aware of the problems the farmers have and assist them in weighing and selling their crops during long working hours.

Summary

Siatwinda Irrigation Scheme has an advanced FEC compared to the other irrigation schemes. Those duties they have taken up or were given by the scheme advisers they are fulfilling sufficiently. The members of the FEC have a very deep feeling of responsibility towards their scheme. They are very much aware of their problems, their shortcomings in every aspect and, most of all, they know very well that they are not able to manage their scheme with their present standard of education and knowledge. Most of them know what they do not know, but are very helpless when it comes to proposals how to overcome these problems.

They know their future aim, the self-reliant management of the scheme and they are willing to take every opportunity to reach this aim.

Though their effectiveness is very limited, they are aware of it!

The educational level of the farmers is very low. The astonishing fact is that though a scale is used regularly at the scheme, hardly any farmer knows how to read it.

5. EVALUATION OF THE FINDINGS

5.1 The Standard of Evaluation

5.1.1 The economical standards

The economical standards of the FEC are, as stated in chapter 1.3, that the FEC's have to be able to

- keep records of the inputs and outputs of their scheme;
- interprete these records to prepare a budget;
- raise appropriate funds in time for the economical running of the scheme.

5.1.2 The non-economical standards

The FEC's point of view

1. Nkandabwe Irrigation Scheme

Though the FEC members of Nkandabwe Irrigation could not express themselves precisely what kind of organisational set up or target performance they are aiming at, it was clear that they wished to be able to manage their scheme in a self sufficient manner.

2. Buleya Malima Irrigation Scheme

For Buleya Malima's FEC it cannot be stated what they are aiming at, since already the present set up was not understood.

3. Siatwinda Irrigation Scheme

Siatwinda Irrigation's FEC could state their aim more precisely. They want to be registered as a cooperative and want to be able to manage the irrigation scheme as an executive committee of a cooperative.

Therefore the target performance for the FEC's of Nkandabwe and Siatwinda Irrigation can be summarized as follows:

- they want to be able to fulfill the duties of the different positions in their committee in a professional manner;
- they want to control, manage, and represent their scheme as producing organisation;

- they want to be registered as a legal management body for their scheme; for Siatwinda Irrigation only:
- they are aiming at the legal status of an executive body of a cooperative.

The Agricultural Assistants' point of view

The AA of Nkandabwe Irrigation as well as the AA of Siatwinda Irrigation are both considering themselves as the scheme advisers in a managing sense. For them the FEC is an assisting body to the management and the FEC has to follow the decisions of the scheme advisers for certain subjects. Therefore, the target performance of the FEC's from the AAs' point of view of these irrigation schemes is that the FEC members have to

- fulfill the economical targets;
- carry out the decisions of the scheme advisers (that is for all water and agriculture matters);
- be able to decide and carry out scheme matters that exclude water and agriculture management.

The AA in Buleya Malima Irrigation stated his point of view of the target performance of the FEC according to the present management set up.

The GSDP advisers' point of view (Gossner Mission)

Since Nkandabwe Irrigation has no GSDP staffmember as a technical adviser, only opinions of the GSDP advisers for Siatwinda and Buleya Malima Irrigation can be considered.

The technical adviser for Buleya Malima Irrigation states that the long term aim for the FEC in Buleya Malima certainly must be that they will be able to manage their scheme in a self sufficient manner. Since the experiences for cooperatives in the Gwembe Valley showed that this organisational set up could lead to

serious problems, he rather favours a general production partnership as a legal status, with the FEC as the management body. Since this long term aim can be seriously considered only after some years, his target performance for the next three to four years for the FEC are those stated in the constitution. The FEC members have to assist the management body and if they are able to fulfill these duties this will lead to the ability to take over the management, finally.

The GSDP scheme adviser for Siatwinda Irrigation states the target performance of the FEC that it has to be able to manage the scheme in a self sufficient manner by all means. This includes apart from the economical target performance stated above, that they are the decision making body for all technical and agricultural matters. Therefore all scheme advisers have to be seen as advisers to the FEC, only.

The point of view of Government representatives

The representatives of the Government who could be interviewed for statements of the target performances of the FEC's were the GSDP Co-ordinator, the Provincial Agriculture Officer, representatives of the District Administration and representatives of the UNIP. All of these representatives could describe the target performance of the FEC's only in vague and rather general statements. They all want the FEC's to be the representatives and management body of their scheme. It was not possible to find out to what extend the FEC's should be responsible for their scheme.

5.2 The Effectiveness of the Farmers' Executive Committees

- Comparison of the standards with the actual performance -

5.2.1 Nkandabwe Irrigation

The economical standards

Nkandabwe Irrigation is not able to fulfill any of the economical standards.

The non-economical standards

The FEC's point of view:

According to the expressed aim of the FEC members they are not fulfilling this standard.

The AA's point of view:

The FEC is not fulfilling any of the target performances stated by the AA of Nkandabwe Irrigation.

The Government representatives' point of view:

The FEC of Nkandabwe Irrigation is not fulfilling the standards set by these representatives.

5.2.2 Buleya Malima Irrigation

The economical standards

According to the constitution of Buleya Malima Irrigation the economical standards do not apply to the FEC. Considering the educational level of the committee members they are not able to fulfill these target performances.

The non-economical standards

The FEC's point of view:

The FEC members of Buleya Malima Irrigation were not able to state their non-economical standards.

The AA's point of view:

The FEC is not fulfilling the standards stated by the AA.

The GSDP adviser's point of view:

The FEC is not fulfilling any of the target performances stated by the GSDP adviser.

The Government representatives' point of view:

The FEC is not fulfilling the standards set by these representatives.

5.2.3 Siatwinda Irrigation

The economical standards

The FEC of Siatwinda Irrigation is only fulfilling the standard of record keeping for limited purposes.

The non-economical standards

The FEC's point of view:

The FEC is not fulfilling these standards.

The AA's point of view:

The FEC is not fulfilling any of the target performances stated by the AA.

The GSDP adviser's point of view:

The FEC is not fulfilling the standard stated by the GSDP adviser.

The Government representatives' point of view:

The FEC is not fulfilling the standards set by these representatives.

All FEC's are not fulfilling the economical standard.

The only FEC which is able to keep records sufficiently for the money handling that is left to them (water fees, seed- and fertilizer-sales) is the FEC of Siatwinda Irrigation.

All FEC's are not fulfilling any of the non-economical standards.

Since the target performance for Siatwinda Irrigation's FEC is to be the management body for the scheme, they are not fulfilling this standard though they are effectively working for a few of their present duties. These duties are:

- plot distribution and expelling farmers from their plot;
- call and conduct meetings;
- record keeping in a reduced meaning (book-keeping for water fees etc., minute writing, and filing).

5.3 The Reasons for the Ineffectiveness with Reference to the Standards

The effects of the historical background

As described in chapter 2 the Gwembe Valley was deprived of any public service and investments until the late 1950s.

The only experience Valley Tongas had with Government authorities were laws that were imposed on them and were in most cases to their disadvantage if not disasterous. The necessity for laws or changes were never explained to them. The result was and still is a deeply rooted mistrust towards all changes and laws imposed on Valley Tongas.

The educational lack in the Gwembe Valley and the gap between the Gwembe Valley and the rest of the country is still causing problems on village level. Though educational services have improved, the level of education of the farmers is not sufficient. The problems start if farmers want to sell their crops and have to pay water fees. Hardly any farmer is able to estimate the real profit he/she is making from the plot.

The Social and Traditional Background

The Tonga tradition is based on a leadership hierarchie. Though traditional leaders are elected, the role of leadership is always with a single person. A committee consisting of a number of people as a leading group is not known. Group-leadership is not part of Tonga culture. Therefore, traditionally the responsibility was always with a single person. Group-responsibility is not part of Tonga culture. Additionally, a difficulty arises if responsibilities have to be taken for matters that are imposed and not understood. The experience with the Colonial/Federal Administration, when failures were heavily punished, left a deep resistance and hesitation to take up responsibilities that are not part of Tonga tradition.

Traditionally the agriculture of Valley Tongas is based on individualism. Communal work is not known, only paid labour. The conditions on all irrigation schemes demand a cooperation between farmers for mutual work. This need for organizing

themselves for working together has to be explained and understood, and most of all has to be experienced, since it is not part of the social organization of Valley Tongas.

The role of women in the social organization of the Valley Tongas is separated from the leadership hierarchy of men. Women never can compete for the position of a leader. Therefore, the participation of women in leadership groups is not part of Tonga tradition and has to be learned.

The reason why some of these difficulties still arise is, that these problems and their causes were never investigated, never taken into account and, therefore, it was never explained to farmers that there is and has to be a difference to the past and their tradition now. The plot distribution to individuals gave farmers the impression that the agriculture is still based on individualism. Only with a thorough training of the lay-out of an irrigation scheme they are able to understand that they have to cooperate with each other.

The Irrigation Schemes

Nkandabwe Irrigation Scheme has suffered from the experience that their scheme was destroyed to save the coal mine. With the experience of the Colonial Government together with the trauma of the Kariba Dam Project this created a reserved attitude towards the scheme where no initiative was taken. Only when the dam broke farmers were spontaneously working hard to rescue their scheme. The unreliability of the future of the scheme is still causing problems to motivate farmers for mutual work. After they have been left without a scheme adviser from the GSDP, untrained for the management of the scheme, they fell back into their traditional system of social organization. It was something they could deal with.

Buleya Malima Irrigation Scheme has suffered from the half-hearted approach and the confusion the set up of the scheme caused. That the money from the orchard was not for their benefit but went to the Government before 1984, and the irrigation technique as well as the management set up was never explained to them is one of the reasons why it is still a problem today to motivate farmers to participate in their scheme and management. Once the FEC members understand the management set up of their scheme it will be not very motivating to work for a management for which they do not have any responsibility.

The fast building up of Siatwinda Irrigation Scheme with heavy machinery and with a technology nobody understood has left the impression with the farmers that they are working for a Government Scheme. During the time this impression was changed and farmers understood that they are working at their own risk. But Siatwinda Irrigation always was and still is sponsored. Therefore, it was never a question for Siatwinda farmers to make enough profit to afford their irrigation supplies. Though the FEC is motivated to work for their scheme, they have never been confronted with the wide range of matters that are involved with the running of an irrigation scheme.

6. PROBLEM SOLUTION PROPOSALS FROM DIFFERENT SOURCES

The Farmers' Executive Committees

All FEC members interviewed expressed themselves more or less explicitly that they want to have a specific on-the-job training for their respective duties in the committee. On-the-job-training means that the duties and how to fulfill them are explained to and practised with them by actually doing their work (book-keeping etc.). This training all of them considered as a basic condition for further training like courses and seminars. Contacts and visits to other schemes can help them to broaden their knowledge and reassure them in their daily work.

The FEC members of Nkandabwe and Siatwinda Irrigation found it necessary that a training has to be provided not only to the FEC members but for the farmers as well in order to include all scheme members in the progress of their scheme. Especially the committee members at Siatwinda complained of the slowness and low level of education of the farmers which is hindering the work and progress of the FEC. Especially the way water fee payments are done in Siatwinda was a cause of complaint. The problem the committee members had to face were that the farmers could not estimate their plot income and therefore had no relation to the amount of the water fee.

The Agricultural Assistants

The solutions for the problems the FEC's face the AA of Nkandabwe Irrigation stated were very vague. The first he wanted them to understand was that they have to work for their scheme and have to follow his advice. The AA for Buleya Malima Irrigation stated that a regular and thorough on-the-job-training will eventually result in a responsible attitude of FEC members and at the same time will motivate them.

The AA for Siatwinda Irrigation expressed himself vaguely that the FEC has to be trained properly. The best training

he could think of was to send members of the FEC to courses according to their duties in the FEC.

The Donor Agency - Gossner Mission

The GSDP adviser for Buleya Malima Irrigation (Gossner Mission expatriate) stated that only a continuous on-the-job-training for each FEC member will result in a functional FEC. This training has to be done by and with the manager. Additionally certain members of the FEC have to be exchanged and the farmers have to be taught that they should elect people who are trained enough for their job in the FEC.

The GSDP adviser for Siatwinda Irrigation (Gossner Mission expatriate) proposed that the training of the FEC has to be a combination of a general training in management and a specific training for certain members (like treasurer). The specific training could be done in courses, the general training has to be at the scheme.

Other members of Gossner Mission who are not directly involved with the irrigation schemes proposed seminars that could be held quarterly where all FEC's meet and exchange their problems. These seminars should be conducted by extension specialists who should set up these seminars in such a way that elements of self estimation and the understanding of the group leadership are part of these seminars.

Government Representatives

All Government representatives interviewed stated that a participatory approach will be a vital element to train the FEC's towards self reliance. The specific training should be left to those who are familiar with the scheme and the farmers. Especially the GSDP Co-ordinator stated that all FEC's need time to adapt and if they are given training with a participatory approach they will learn most effectively.

7. THE FEASIBILITY OF EFFECTIVENESS OF THE FARMERS' EXECUTIVE COMMITTEES

Though the difficulties described can be overcome quite easily, it needs a process of consciousness and training. All these traditional and historical handicaps that caused confusion and problems for the management set up of the irrigation schemes are not causing a strict rejection of such a set up. If it is explained and understood during a process of training and experience, farmers are willing and even competing for the different jobs in their management.

7.1 The Farmers' Executive Committee as the only Efficient Alternative

Considering the objectives of the irrigation schemes and the policy of the GSDP which is a participatory approach, the Farmers' Executive Committees as a management body for their irrigation schemes are the only efficient alternative for the management of these irrigation schemes.

The objectives of these irrigation schemes in general are to improve the living conditions of the people of the area and to introduce new methods of agriculture to the farmers. A participatory approach means that technical innovations and changes in the social system like a management set up which was not known before is done with the people the improvements are meant for in order to make them understand and learn with the development of the scheme.

If an appointed manager or an appointed management team would manage the scheme these person(s) have to run the scheme to its best economical effectiveness. With this pressure there will be no time for developing the scheme with the farmers. The farmers will fall back into a reluctant attitude again because they do not understand what is expected of them. Even if this time for extension work is given, the motivation to follow the manager's

advice will be almost non-existent.

Only if the farmers experience that they are managing their own scheme, by people elected by them, they will believe that it is really their own scheme.

All other management set ups are bound to fail as the history of the schemes and the findings of this research shows.

To be able to work effectively the FEC's have to have competence, which is logical if it comes to carry out decisions made by the FEC. At the same time it is necessary to give this competence to the FEC by a constitution to motivate the development of the FEC towards effectiveness.

Almost every literature which deals with the implementation of innovations, whether theoretically or by describing the experience, concludes the fact that the participatory approach is the most successful and - in the long run - the most effective for economical as well as non-economical standards.

7.2 The Training Programme

With the results of the study of the traditional and historical background of the Valley Tonga, the history of the irrigation schemes, the findings of the present situation of the FEC's and the different proposals of problem solutions the researcher has worked out a detailed programme to overcome the difficulties the FEC's are facing at present. The researcher is convinced that with this training programme the effectiveness of the FEC's in all aspects are feasible.

A very important assumption for the success of this training programme is that all staff members involved with the irrigation schemes, especially the GSDP adviser, are supporting this programme by all means, since the extension specialist responsible for the training has to overcome the reluctance of the farmers and the indiffe-

rence of FEC members already. If the purpose of the irrigation schemes is that it should improve the living conditions of the people involved, this training programme should be taken seriously, because it is a possibility for those whom irrigation is meant for to adapt to the new technique as well as to social changes towards an improved way of life.

The problems that originate from past experience with Governmental Authorities and from the traditional background are the same for all irrigation schemes. The Valley Tonga have proven in the past that they are able to adapt to changes. Their climate and agricultural conditions always were unpredictable and always Valley Tongas have made the best of the possibilities that were left to them. Only, the space and time to adapt has to be there. If changes are understood the new conditions are included in the social organization and experience will convince.

The approach to give the farmers as well as their management body the chance to overcome their present ineffectiveness has to be a participatory approach. The experience of the past where changes and laws were imposed on Valley Tongas created a reluctant attitude. To overcome this attitude all training has to start from what the majority knows and is used to. This will give the required space to adapt.

Since all irrigation schemes have a different history, a different management/advisory set up and a different level of awareness and education of the FEC members, a special training programme for each FEC is lined out.

The training programme is designed to take place at three different levels at the same time. The levels are:

1. The organisational structure (especially for Buleya Malima);

2. Training of the FEC's

3. Training of farmers

Since the lack of basic education is not only a tremendous disadvantage for the farmers, it also is hindering the work of the management body.

1. The organisational structure of the irrigation schemes

Buleya Malima irrigation farmers are electing canal committees and their FEC each year. Here the FEC is responsible to the manager and the scheme adviser, not the other way around. This management set up is not appropriate for a participatory approach. If the conditions for the FEC to become the management body for their scheme are not laid out accordingly, the future aim will be endangered already with these starting conditions. The FEC's at the other irrigation schemes always had the possibilities to take over the management because their organisational management set up was designed accordingly. If a FEC is not ready for the take over of the management, advisers always assisted. In Buleya Malima, once the FEC is trained enough to understand the consequences of their management set up, the constitution of the management set up has to be changed. It should be considered to change the constitution first, since this will be a motivation already and the FEC has clearly stated targets they can aim for. The manager has to be answerable to the FEC and the technical adviser has to distinguish his role clearly from the management.

The effect of such a management set up like it is presently practised in Buleya Malima can be seen already. The members of the FEC are neither motivated nor interested in their duties. For them the manager and the scheme adviser make the decisions anyhow.

In Nkandabwe Irrigation all farmers elect the FEC once per year. The FEC is the management body for the scheme with the AA as an agricultural and extension adviser. This

management set up is appropriate and functioning as long as

- the FEC members are fully trained for their duties and responsibilities;
- each FEC member is specially trained for the very position he/she is holding in the FEC;
- the AA is not considering himself as the scheme manager.

In an advanced stage this management set up can be legalized by registering as a cooperative. If the work load starts to be too much for the committee members, a manager, book-keeper etc. can be employed. These persons should be recruited out of members of the irrigation scheme and should not come as "outside specialists" to the scheme. These employees have to be responsible to the FEC. At this stage the FEC has to consider the period of election. It would be more appropriate to elect the FEC members for a longer period, at least for 3 years, to ensure a trained and experienced management body.

In Siatwinda Irrigation the FEC is elected every two years. This is an advantage since the FEC will benefit longer from the period of adjustment of the FEC-members. The FEC is acting to a limited extend as a management body already. Further training will obviously lead to a legalization of the scheme as a producing organisation with the FEC as a management body. Already the work load is creating problems at times. Therefore, it has to be considered if Siatwinda Irrigation can afford to employ a book-keeper and/or manager for their scheme who is answerable to the FEC. These persons should be recruited out of scheme members and should not come as "outside specialists" to the scheme.

The role of the AA and scheme adviser has to be clarified. They are advisers only.

2. Training of the Farmers' Executive Committee

The training for the FEC as a whole as well as for each FEC member has to be done with a participatory approach. This approach is important because by involving the committee members in identifying priority needs and formulating work procedures a learning effect can be achieved. This approach can lead to a new consciousness and a change in the social structures by the participants themselves. The training programme has to be adjusted to the special conditions of the irrigation schemes and has to be flexible enough to be adjusted to the very speed and needs of the training situation.

Since all FEC-members of all irrigation schemes need a specific training to work effectively as a committee first the training has to be designed for each FEC specially. The proposed external seminars and courses for FEC's are not appropriate for the time being. At the stage, when each FEC member knows his/her duty because of the on-the-job-training and is able to fulfill these duties, seminars can be considered in order to assure the FEC of their work and to teach them appropriate self estimation.

The proposed courses for certain members of the FEC like the treasurers or the secretaries are problematic. The members of the FEC's are elected for a one year period, in Siatwinda for two years. A person who will be sent on a course will be not available for at least three months for the FEC work. In the case that this person is not re-elected the effort of training will be too costly, time consuming without the necessary benefit to the management of the irrigation scheme.

The insecurity and the feeling of incompetence of the members of the FEC for Nkandabwe Irrigation and Buleya Malima first of all needs a back up and thorough training with the FEC. For each irrigation scheme the

starting level of the training programme has to be according to the level of the FEC. An agricultural extension specialist has to meet weekly with the committee members. The meeting should be only one hour and has to include a general training on management and duties of each FEC member as well as a discussion of present scheme problems. The AA should only attend this training meetings once in a while to give FEC members the opportunity to express themselves freely and to give them the feeling of competence.

The lecture meetings have to be minuted under the supervision of the extension specialist and have to be filed for future members.

The objectives of this training are:

- the FEC members have to understand the significance of a management body for an irrigation scheme;
- each FEC member has to know the duties of each member;
- all FEC members have to know the set up technical-, financial-, and management-wise of the scheme;
- all FEC members have to be able to carry out the decisions made by the committee.

Especially in Nkandabwe Irrigation the new elected committee members have to be trained thoroughly to get to know the duties of each committee member as well as the meaning of a management body. Because in Tonga tradition elder people have to be respected and followed it will be a difficult process to make the FEC members as well as the farmers understand that irrigation matters are settled differently to their social system.

For the FEC training a curriculum specially designed for each irrigation scheme has to be laid out for the first month. The experience of the first month will lead to further curriculæ.

This FEC training should be carried out for approximately one year. After this year it has to be evaluated and it

has to be decided whether and how the training programme should continue. At that stage it can be discussed if courses and/or seminars will be valuable and appropriate for FEC members.

After a period of three months the training programme of the FEC has to be evaluated and if necessary adapted.

After a period of approximately three months while the farmers' training is taking place additionally, the trainers from the Farmers Training Center at Malima have to be invited approximately once per month to give lectures about agricultural methods for irrigation farmers. These lessons should be for all farmers.

At the same time visits of the FEC to the other irrigation schemes have to be organized. The FEC's have to meet to exchange the experience and different set ups of their schemes.

The objectives of this part of the programme are:

- the FEC's have to be able to communicate with other schemes and their management set up in order to evaluate their own set up and the reality;
- the farmers have to be up to date with agricultural methods appropriate to their farming conditions.

After a period of 6 months of regular training it can be considered whether the FEC members feel ready for registering as a legal producing organisation. If this is expressed by the FEC as well as by the farmers, representatives from the District Marketing and Cooperative Office as the office in charge for registering cooperatives have to be invited to inform the FEC of the possibilities and consequences of registering as a cooperative. A cooperative training, if it is wished, can be laid out and organized with this Department accordingly.

Since all FEC's have no legal status at present this training programme is aiming towards the registration of each scheme as a legal organisation. This will protect the irrigation schemes and give the FEC a legal status as representatives of their scheme.

If this training set up is conducted in a sensitive way, considering the historical, cultural and educational problems that arise at the schemes it will give the time and space to adapt to the new technical and management methods.

3. Farmers Training

The educational level of the farmers at all irrigation schemes is very low. The vital knowledge for farmers who make a living by selling their crops is to be able to work out change and to be able to read and deal with a scale. Both abilities are lacking with most of the farmers. Some cannot even identify Kwacha notes.

It is significant that at those schemes were the old measurement system of volume measurements (bucket) is still used, more farmers knew the income from their plot than at Siatwinda Irrigation where only the scale as a crop measurement is used (see results of farmers interviews).

The researcher was told that approximately three years ago a GSDP staff member had initiated a training programme for farmers at Siatwinda to train them at the scale, in basic mathematics. According to the statement of the AA this training programme was very successful, though it did not reack illiterate farmers because the programme was not designed as a literacy training programme. Nevertheless, it was not followed up and the result of the interviews showed no evidence of a training programme.

If farmers cannot estimate or work out the output of their plots, cannot deduct the input they have no idea about the relationship of water fees and profit they make from their plots. This results in a constant battle to get the farmers to pay their water fees.

All these conditions are more or less the same at all irrigation schemes. Therefore, the educational level of the farmers has to be raised.

A programme for the training of farmers has to start at each irrigation scheme. This programme is outlined as follows:

For each irrigation scheme a teacher for the training of the farmers has to be employed. The teacher has to be a trained teacher and has to be fluent in English and Valley Tonga because he has to be supervised by extension specialists and/or adult training specialists for illiterate training. The teacher has to live permanently close to the irrigation scheme to ensure the regularity and punctuality of the lessons. The teacher has to get an introduction by a specialist for literacy training and has to meet monthly with this specialist. All teachers will be supervised by the extension worker who is responsible for the organisation of this training programme. A curriculum has to be laid out for the first month of farmers' training. After this month the experience and problems of the teachers have to be evaluated by the supervising extensionist together with the specialist for adult literacy training. According to this evaluation further curriculae have to be written.

The training hours should not exceed one hour per day, but have to be five times per week at different levels and at a convenient time for irrigation farmers in order to give all farmers a chance to participate.

The short-term objectives of this training programme are

- the farmers have to be able to identify all units of the national currency;

- the farmers have to be able to work out change;
- the farmers have to understand the difference between volume and weight measurements;
- the farmers have to be able to read a scale;
- the farmers have to be able to work out prices according to the exact amount of weight.

This training programme should be carried out as a pilot programme for approximatly one year. After one year it should be evaluated and adjusted accordingly. If an additional training for reading and writing should be included, this has to be decided according to the evaluation of this programme.

If the objective of these irrigation schemes is to improve the living conditions of those participating in irrigation farming, the help given to the farmers never should be technical and financial support only. The problems that arise if the social and historical background is not considered can cause a complete dependency on the Government and/or donor agency as lined out in this research. For all innovations the social impact has to be taken into account and the approach has to be line out accordingly.

Help without the necessary extension support is not fair to those the help is meant for!

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APPENDIX

APPENDIX I

Nkandabwe Irrigation Scheme

Farmers' Executive Committee - 1st questionnaire - page 1
February 1987

1. Since when are you a member of the FEC?
warming up question, gives an idea about the experience the FEC member should have
2. Please, describe your duties as (chairman, ...).
key question for analysing the ability of the FEC member to understand his/her duties. The answer is intended to include a description of how the FEC member is fulfilling his/her duties he/she thinks he/she has.
3. Do you manage to do all this?
softening the interrogative question 2, answer can be used to analyse how the FEC member sees his/her own work and how he/she can be trained.
4. Please, describe the situation of your scheme, constraints, progress.
softening question to let the FEC member talk about the scheme in general, answer gives an idea how well informed the FEC member is about the scheme in general
5. Do you personally want/need assistance for your job in the FEC?
key question for the planning of a training set up for FEC members
6. To whom do you turn to when you need help for the scheme?
answer can be analysed to what assistance and support the FEC gets presently and if the FEC understands the link to the GSDP
7. To whom do you turn to when you need help for the FEC?
same like 6., only more detailed for the FEC
8. Please show me your files/books.
key observation for the analysis of the effectiveness of the FEC
9. Can you tell me how you think you can solve
- the water problem; mutual work with farmers; water management; water fees; fence repair; raising funds?
eases off the interview gives an idea how informed the FEC member is and how he/she feels responsible for the scheme, even when problem solvings are not his/her duties. Especially for trustee members this question gives an opportunity to test their cooperation in the FEC.

Nkandabwe Irrigation Scheme

Farmers' Executive Committee - 1st questionnaire - page 2
February 1987

10. Does the scheme in general have problems with marketing?

key question for the effectiveness analysis; the question intends to let the interviewed person not only list problems, but state solution proposals without being asked. This is to find out if the interviewed person takes up initiatives. If no solutions were told, the interviewed person was not asked to present them.

11. Do you think your FEC is strong?

key question to analyse the self-estimation of the FEC member

12. What do the farmers think about the FEC?
same like 11.

13. Is the AA (Mr. ...) assisting you in your committee work?

essential question to estimate the support the FEC is getting from the AA

question 14. to 17.:

These questions are asked to give a general idea about the educational level of FEC members and to estimate the difference (if there is any) between the educational level of FEC members and other farmers.

14. Do you know about kg's?

if answer is "yes": - have you seen a scale?
- can you read a scale?
- describe how you read a scale?

if all answers are satisfying:

- how many grams are in 1 kg?

15. If one kg/bucket of tomatoes is ...K, how much are 3/4 ... kg's/buckets?

16. Identify K-notes!

How many ngwes are in one Kwacha?

17. Work out change (if I buy tomatoes for 1,25 K and give you a 5,-- K note, how much is the change?)

A P P E N D I X II

Nkandabwe Irrigation Scheme

Farmers' Executive Committee - 2nd questionnaire - page 1
May 1987

1. Why are you a member of the FEC now?
question intends to puzzle the FEC member and make him answer involuntary honest about his feelings of the FEC
2. Do you think a FEC is necessary for your scheme?
impression of the election meeting was that hardly anybody felt any need for a FEC, this question is intended to make the FEC members talk about it
3. Please, describe your duties as a(chairman,....).
key question for analysing the effectiveness of the FEC
4. Do you think the farmers will have faith in you, trust you?
question in respect of the former committee where it was clear that only the secretary was trusted, answer can be analysed for self-estimation of the FEC member
5. Do you think you can manage?
easing off the interview, key question for planning a training programme
if the answer is "no": What kind of assistance do you want?

6. Do you think the farmers will follow the FEC now?
question is not ment for evaluation, question is suppose to be a motivation to take up initiatives

Thourough explanation of the duties and procedures of the FEC in general and the very function in particular.

questions 7. to 10.:

These questions are asked to give a general idea about the educational level of FEC members and to estimate the difference (if there is any) between the educational level of FEC members and other farmers.

7. Do you know about kg's?

if answer is "yes": - have you seen a scale?
- can you read a scale?
- describe how you read a scale?

if all answers are satisfying:

- how many grams are in 1 kg?

Nkandabwe Irrigation Scheme

Farmers' Executive Committee - 2nd questionnaire - page 2

8. If one kg/bucket of tomatoes isK, how much are $\frac{3}{4}$ kg/buckets?
9. Identify K-notes!
How many ngwes are in one Kwacha?
10. Work out change (if I buy tomatoes for 1,25 K and give you a 5,-- K note, how much is the change?)

A P P E N D I X III

Nkandabwe Irrigation Scheme

farmers questionnaire

page 1

June 1987

male/female

No. of interview:

1. Since when do you have your plot?
if answer is "cannot remember", or "since Federal times":
Are you resettled from the Zambezi river side?
warming up question - gives an idea how long and under what circumstances the farmer started - leads to question 4. - gives the farmer an opportunity to talk
2. What do you grow on your plot?
warming up question
3. Have you worked on your plot last year?
leads to question 4.
4. How much did you earn from your plot last year?
key question for analysing the ability of the farmer to evaluate income from the plot
5. Do you know the FEC (farmers committee)?
key question for analysing the understanding and cooperation with and of the FEC
6. Do you think they do a good job?
on purpose put before question 7. to check how the farmer is just following what he/she thinks he ought to say
7. What do they do?
key question to analyse the farmers understanding of the FEC and its function - check question for question 6, if necessary
if the answer for 6. is "yes" and for 7. "don't know":
Why do you say they do a good job, if you don't know what they do?
8. Do you think you need a FEC?
key question to analyse the understanding of the irrigation scheme management
9. Is the AA (Mr. ...) assisting you?
key question to analyse the role of the AA

Nkandabwe Irrigation Scheme
farmers questionnaire
June 1987

page 2

No. of interview:

10. How is he assisting you? What does he do?
same like 9.
11. Do you have problems with your plot?
softening the interview, warming up question
12. Do you have problems within the scheme?
question to analyse how much the farmer is taking initiative in mutual problems
13. Do you know what the people at the mess do
(meaning the GSDP camp)?
key question for analysing the understanding of the link to GSDP. The question had to be put so vague, since the researcher already realized before the interview that even FEC members had no idea about the connection between Nkandabwe Irrigation and the GSDP.
14. Do you know about kg's?
if answer is "yes": - have you seen a scale?
- can you read a scale?
- describe how you read a scale!
if all answers are satisfying:
- how many grams are in 1 kg?
key question to analyse the educational level of the farmer
15. If one kg/bucket of tomatoes is ... K, how much are 3/4 kg's/buckets? same like 14.
16. Identify K-notes!
How many ngwes are in one Kwacha? same like 14.
17. Work out change (if I buy tomatoes for 1,25 K and give you a 5,-- K note, how much is the change?
same like 14.
18. To whom do you go when you need help?
softening the interview, warming up question, gives an idea, if the farmer has confidence in the AA and/or the FEC

Nkandabwe Irrigation Scheme
farmers questionnaire
June 1987

page 3

No. of interview

19. If there would be lessons for farmers (about the kg's and change), would you go?
question to initiate the idea that with training the farmer would be better off
20. Would you go, even if it is for men and women together?
question to make the farmer aware of a training course for both sexes
21. Did you pay your water fees?
if answer is yes: - did you pay for last year and this year?
 - how much did you pay?
 - when did you pay?
 - to whom did you pay?
if answer is no: - why not?
key questions to analyse the sense of duty the farmer feels towards his/her scheme
22. Which year are you borne?
23. Did you go to school?
softening the interview by letting the farmer talk, gives an idea about the general level of education

A P P E N D I X IV

Buleya Malima Irrigation Scheme
Farmers' Executive Committee questionnaire
March 1987

page 1

1. Since when do you have a plot in the scheme?

warming up question, here the question "since when are you a member of the FEC?" was not appropriate, since the FEC was elected in November 1986 for the first time

2. How do you feel about the management set up of the scheme? Please, describe it first, so that I know about it.

key question to analyse the understanding of the management set up

3. Why are you a member of the FEC?

question is intended to find out if the FEC member is personally interested in the FEC work or if he/she sees the need of the FEC and feels responsible for the scheme

4. Please, describe your duties as a (chairman, ...).
key question for analysing the ability of the FEC member to understand his duties. The answer is intended to include a description of how the FEC member is fulfilling his/her duties he/she thinks he/she has.

5. Do you manage to do all this?

softening the interrogative questions 3. and 4. - the answer can be used to analyse how the FEC member sees his own work and how he can be trained.

6. Please, describe the situation of your scheme, constraints, progress.

softening question to let the FEC member talk about the scheme in general, answer gives an idea how well informed the FEC member is about the scheme in general

7. Do you personally want/need assistance for your job in the FEC?

key question for a training set up for FEC members

8. Do you know the GSDP?

key question for analysing the understanding of the set up of the scheme and the link to GSDP

9. Do you think your FEC is strong?

key question to analyse the self-estimation of the FEC member

Buleya Malima Irrigation Scheme

Farmers' Executive Committee questionnaire

page 2

10. What do the farmers think about the FEC?

same like 9.

11. Who is assisting you for your work in the FEC?

essential question to estimate the support the FEC
is getting

question 12. to 15.:

These questions are asked to give a general idea about
the educational level of FEC members and to estimate
the difference (if there is any) between the educational
level of FEC members and other farmers.

12. Do you know about kg's?

if answer is "yes": - have you seen a scale?
- can you read a scale?
- describe how you read a scale?

if all answers are satisfying:

- how many grams are in 1 kg?

13. If one kg/bucket of tomatoes is ...K, how much are
3/4 ... kg's/buckets?

14. Identify K-notes!

How many ngwes are in one Kwacha?

15. Work out change (if I buy tomatoes for 1,25 K and
give you a 5,-- K note, how much is the change?)

A P P E N D I X V

Buleya Malima Irrigation Scheme

farmers questionnaire

page 1

May 1987

male/female

No. of interview

1. Since when do you have the plot?

warming up question, leads to question 3.

2. What do you grow?

warming up question

3. Did you work on your plot last year?

leads to question 4.

4. How much did you earn last year from your plot?

key question for analysing the ability of the farmer
to evaluate income from the plot

5. Did you pay your water fees?

if yes: when?

if no : why not?

key question to analyse the sense of duty the farmer
feels towards his/her scheme

6. Do you know the canal committee?

key question to analyse the understanding of the
management set up

7. What do they do?

same like 6.

8. Do you know the FEC?

same like 6.

9. Do you think they are doing a good job?

on purpose put before question 10. to check how the
farmer is just following what he thinks he ought to
say

10. What do they do?

key question to analyse the farmers understanding
of the FEC and its function - check question for
9. if necessary

if the answer for 9. is "yes" and for 10. "don't know":

Why do you say they are doing a good job, if you don't
know what they do?

11. Who is managing the scheme?

key question for analysing the understanding of the
management set up

Buleya Malima Irrigation Scheme
farmers questionnaire

page 2

No. of interview:

12. Do you know Mr. ... (AA)?

key question to analyse the role of the AA

13. What does he do?

check question for 12. and for analysing the activities of the AA

14. Do you know Mr. ... (manager)?

same like 12. respectively

15. What does he do?

same like 15. respectively

16. Do you know Mr. ... (GSDP adviser)?

same like 12. respectively

17. What does he do?

same like 15. respectively

18. Do you have problems with your plot?

softening the interview, warming up question

19. Do you know the people at Sinazeze mess?

key question for analysing the understanding of the link to GSDP (= mess)

20. Do you know about kg's?

if answer is "yes": - have you seen a scale?

- can you read a scale?

- describe how you read a scale?

if all answers are satisfying:

- how many grams are in 1 kg?

key questions to analyse the educational level of the farmer

21. If one kg/bucket of tomatoes is ... K, how much are 3/4 kg's buckets?

same like 20.

22. Identify K-notes!

How many ngwes are in 1 K?

same like 20.

23. Work out change (if I buy tomatoes for 1,75 K and give you a 5,-- K note, how much is the change?)
same like 20.

Buleya Malima Irrigation Scheme
farmers questionnaire

page 3

No. of interview:

24. To whom do you go when you need help?

Softening the interview, warming up question, gives an idea if the farmer has confidence in the AA and/or FEC

25. If there would be lessons for farmers (about the kg's and change), would you go?

question to initiate the idea that with training the farmer would be better off

26. Would you go, even if it is for men and women together? question to make the farmer aware of a training course for both sexes

27. Which year are you borne? softening the interview by

28. Did you go to school? letting the farmer talk, gives an idea about the general educational level

APPENDIX VI

Siatwinda Pilot Irrigation Scheme

Farmers' Executive Committee questionnaire

page 1

February - March 1987

1. Since when are you a member of the FEC?

warming up question, gives an idea how much the member should know

2. Why are you a member of the FEC?

should puzzle the interviewed person, the answer gives information about the sense of duty towards the scheme

3. Please, describe your duties as a ... (chairman, ...).

key question for analysing the ability of the FEC member to understand his/her duties. The answer is intended to include a description of how the FEC member is fulfilling his/her duties he/she thinks he/she has.

4. Do you do work for the scheme that is not part of

your job as a (chairman, ...) of the FEC?

softening question to let the FEC member talk about the scheme and his/her involvement

5. Do you manage to do all this?

softens the interview further, gives the FEC member an opportunity to talk about problems and is a key question for the set up of a training programme

6. Please, show me your books, files, etc.

key observation for the analysis of the effectiveness of the FEC (only for chairman, secretary, treasurer and their vices)

7. Please, describe the situation of your scheme, problems and progress.

answer gives information about the awareness of the FEC member of general problems and of the responsibility the FEC member feels towards the scheme in general

8. How do you see your committee?

key question to analyse the self estimation of the FEC member

9. Do you have any proposals or ideas for improvements?

key question to analyse the initiative, the ability of identifying problems and finding solutions

10. How do you think the farmers look upon the FEC?

same like 8.

Siatwinda Pilot Irrigation Scheme
Farmers' Executive Committee questionnaire

page 2

11. Does Mr. ... (AA) assist you in your FEC work?
essential question to estimate the support the FEC gets
12. Does Mr. ... (GSDP adviser) assist you in your FEC work?
same like 11.
13. Do you know the GSDP?
key question for analysing the understanding of the link to GSDP
14. Do you know the connection between Siatwinda and the GSDP?
same like 13.
15. Would you like some training for your job in the FEC?
key question for a training set up for FEC members
16. What kind of?
same like 15.
17. How do you think you can improve the effectiveness of your FEC?
same like 9., gives the FEC member an opportunity to talk about his/her own ideas
question 18. to 21.:
These questions are asked to give a general idea about the educational level of FEC members and to estimate the difference (if there is any) between the educational level of FEC members and other farmers.
18. Do you know about kg's?
if answer is "yes": - have you seen a scale?
- can you read a scale?
- describe how you read a scale?
if all answers are satisfying:
- how many grams are in 1 kg?
19. If one kg/bucket of tomatoes is ... K, how much are 3/4 ... kg's/buckets?
20. Identify K-notes!
How many ngwes are in one Kwacha?
21. Work out change (if I buy tomatoes for 1,25 K and give you a 5,-- K note, how much is the change?).

A P P E N D I X VII

Siatwinda Pilot Irrigation Scheme

farmers questionnaire

page 1

March-May 1987

male/female

No. or interview:

1. Since when do you have the plot?

warming up question, leads to question 3.

2. What do you grow?

warming up question

3. Did you work on your plot last year?

leads to question 4.

4. How much did you earn from your plot last year?

key question to analyse the ability of the farmer
to evaluate his/her income from the plot

5. Is Mr. ... (AA) assisting you?

question to analyse the role of the AA

6. How?

same like 5.

7. Do you know Mr. ... (GSDP adviser)?

question to analyse the role of the GSDP adviser

8. Is he assisting you?

same like 7.

9. How?

same like 7.

10. Do you know the FEC?

key question to analyse the knowledge of the FEC,
the understanding, and cooperation

11. Do you think they do a good job?

on purpose put before question 12. to check how the
farmer is just following what he thinks he ought to say

12. What do they do?

key question to analyse the farmers understanding of
the FEC and its function; check question for 11.

Siatwinda Pilot Irrigation Scheme
farmers questionnaire

page 2

No. of interview:

13. Do you know about kg's?

if answer is "yes": - have you seen a scale?
- can you read a scale?
- describe how you read a scale!

if all answers are satisfying:

- how many grams are in 1 kg?

key question to analyse the educational level
of the farmer

14. If one kg of tomatoes is ... K, how much are

2/3 kg's?

same like 13.

15. Identify K-notes!

How many ngwes are in one Kwacha?

same like 13.

16. Work out change (if I buy tomatoes for 1,25 K and
give you a 5,-- K note, how much is the change?).
same like 13.

17. Whom do you ask for help?

softening the interview

18. If there would be lessons for farmers (about Kg's
and change) would you go?

question to initiate the idea that with training
the farmer would be better off

19. Would you go , even if it is for men and women
together?

question to make the farmer aware of a training
course for both sexes

20. Did you go to school?

softening question, gives an idea about the
level of formal education of the farmer

21. Do you know the GSDP?

key question to analyse the understanding of the
farmer about the link to the GSDP

22. Do you know that Siatwinda is part of the GSDP?

same like 21.

Bericht über mein Praktikum im Gwembe-Süd Entwicklungsprojekt
in Sambia

Almut Jering
Burgherrenstr. 7
1000 Berlin 42

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0. Vorwort

Dank der Förderung durch den Deutschen Akademischen Austauschdienst hatte ich die Möglichkeit, die Einladung des Projektkoordinators des Gwembe-Süd Entwicklungsprojekts für einen praxisbezogenen Studienaufenthalt in Sambia anzunehmen. Vom 1.Juni 1988 bis 28.August 1988 leistete ich mein Praktikum im GSDP im Gwembetal ab.

In den ersten drei Wochen meines Aufenthaltes lernte ich das Projekt mit all seinen Einzelkomponenten kennen. Ich bekam Einblick in Projektplanung, Projektgestaltung und -organisation und in die alltägliche Projektarbeit vor Ort. Ein besonderes Erlebnis war dabei die Teilnahme am jährlich stattfindenden Evaluierungsseminar des GSDP, bei dem Wege und Möglichkeiten weiterer Entwicklungsarbeit mit allen Beteiligten entwickelt wurden.

Nachdem ich mit dem GSDP, seinen Zielen und seinen Aufgaben vertraut war, führte ich eine Untersuchung zum Nkandabwe Bewässerungsprojekt durch, die im folgenden Bericht dargestellt wird.

Meinen persönlichen Dank möchte ich aussprechen dem DAAD für die finanzielle Förderung meines Praktikums, allen Mitarbeitern des GSDP's und meinen sambianischen Freunden für die freundliche Aufnahme und Gastfreundschaft, die sie mir entgegenbrachten.

0.1. Abkürzungsverzeichnis.

BOMA	= British Overseas Military Administration
CAO	= Chief Administrative Officer
FEC	= Farmers' Executive Committee
IRDP	= Integrated Rural Development Project
GM	= Gossner Mission
GRZ	= Government of the Republic of Zambia
GSDP	= Gwembe-South Development Project
GST	= Gossner Service Team
GVDC	= Gwembe Valley Development Company
NBP	= Nkandabwe Bewässerungsprojekt
VSP	= Valley Self Help Promotion

0.2. ÜBERSICHTSPLAN ZU MEINEM PRAKTIKUM IM GWEMBE-SÜD
ENTWICKLUNGSPROJEKT IN SAMBIA VOM 1.6.1988 -
28.8.1988.

01.6.88 Ankunft in Lusaka, Empfang im GM-Headquater, erste informelle Gespräche mit langjährigen GM-Mitarbeitern

02.6.88 Ankunft im GSDP-camp im Gwembetal, Vorstellung bei Projektkoordinator, Vorsitzendem und Mitarbeitern

03.6.-12.6.88 Einführung ins Gwembe-Süd Entwicklungsprojekt:
- Besuch des Siatwinda Bewässerungsprojekts
- Besuch des Buleya-Malima Bewässerungsprojekts
- Besuch des Nkandabwe Bewässerungsprojekts
- Teilnahme an den dort wöchentlich stattfindenden Treffen der Bauernräte
- Unterrichtsbeobachtung des Trainingsprogramms
- Feldbegehungen mit Bauern und landwirtschaftlichen Beratern
- Besuch und Teilnahme an Sitzungen und Aktionen des Frauenberatungsprogramms
- Besuch der verschiedenen Werkstätten und Ausbildungsprogramme im Camp und vor Ort: Schreiner, Maurer, Ziegelhersteller, Brunnenbauer, Straßenbauer.
- Besuch der Einrichtungen des VSP.
- Besuch der Boma in Sinazongwe.
- Vorstellung und erste informative Gespräche mit dem CAO.
- Besuch der Chikuni-Cooperative (Weiterverarbeitung von landwirtschaftlichen Produkten)
- Besuch und Führung auf der Großfarm der GVDC.
- Einführung in Buchhaltungswesen von GRZ und GM, Akteneinsicht in Projektmaterial.

13.6.-17.6.88 Teilnahme am GSDP Evaluierungsseminar.

18.6.88 Staffmeeting

19.6.-21.6.88 Teammeeting der GM-Mitarbeiter in Lochinvar: Auswertung und Verarbeitung der Ergebnisse des Evaluierungsseminars. Planung von künftiger Projektpolitik und Projektarbeitsschwerpunkten.

22.6.-13.7.88 Vorbereitung meiner Untersuchung zum Thema: Funktion und Wirkungsweise des Nkandabwe-Bewässerungsprojekts.
- Literaturstudium.
- Vorbereitung und Erstellung der vorläufigen Interviews.
- Kontaktaufnahme mit Dolmetschern und Interviewpersonen.
- Einführung bei den Dorfvorstehern im Untersuchungsgebiet.
- Organisation von Bauernmeetings.
- Datensammlung zu Bevölkerungsstruktur, Beschäftigungsstruktur, Einkommensstruktur und -verteilung.
- Schulung des Dolmetschers.

- Abhaltung von informellen Bauernmeetings in fünf Dörfern des Untersuchungsgebietes.
- Pretest der Fragebögen.
- Übersetzung und Auswertung der Pretests.
- Erstellung der endgültigen Fragebögen.
- Festlegung der Stichproben.

14.7.88 Staffmeeting

15.7.-14.8.88 Feldphase

- Durchführung der Interviews.
- Anleitung von 25 Familien zur Aufzeichnung ihrer täglichen Diäten und Ausgaben
- Kontrolle dieser Aufzeichnungen
- Vorbereitung und Mitarbeit bei Organisation und Durchführung von drei workshops zur Erosionskontrolle und -bekämpfung für Bauern im Projektgebiet.
- Vorbereitung und Organisation von Bauern im Untersuchungsgebiet für die lokale Landwirtschaftsausstellung.

15.8.88 Rückkehr ins Camp.

16.8.88 Staffmeeting.

17.8.-21.8.88 Mitarbeit und Organisation bei Saatgutbesorgung und Verteilung.

22.8.-26.8.88 Beginn der Evaluierung der Untersuchung.
Abschließende Diskussionen mit GSDP-Koordinator, GST-Vorsitzendem und Regierungsangestellten der Boma in Sinazeze.

27.8.88 Abreise nach Lusaka.

28.8.88 Abflug nach Deutschland.

1. DAS GWEMBE-SÜD ENTWICKLUNGSPROJEKT (GSDP).

1.1. Das Gwembetal und seine Bevölkerung.

Der Gwembe Distrikt liegt in der Südprovinz Sambias an der Grenze zu Simbabwe. Der Distrikt hat eine Gesamtfläche von 12.340km², und erstreckt sich über ein Gebiet von 300km Länge entlang dem Karibasee und einer Breite von 20 bis 50km. Verwaltungsmäßig ist Gwembe in drei Unterdistrikte geteilt: Gwembe-Nord, Zentral-Gwembe und Gwembe-Süd.

Die Zahl der im Gwembetal lebenden Menschen wird heute auf 130.000 geschätzt. Der größte Teil der Bevölkerung lebt in ländlichen Gebieten und ist von der Landwirtschaft abhängig. Das jährliche Bevölkerungswachstum liegt bei 3,4% und wächst somit wesentlich schneller an als die Wachstumsraten in der Nahrungsmittelproduktion.

Das Klima in Gwembe ist semiarid mit nur einer Regenzeit im Jahr und einer ausgeprägten Trockenzeit. Die durchschnittliche Niederschlagsmenge liegt bei 750mm, wobei von Jahr zu Jahr sehr starke Schwankungen in Niederschlagsmenge und Niederschlagsverteilung auftreten. Unzuverlässige und unregelmäßige Niederschläge sind zweifellos eines der größten Probleme für die Menschen im Gwembe Distrikt.

Die Bevölkerung gehört der Ethnie der Tonga an, die höchstwahrscheinlich schon seit sehr langer Zeit das Gwembetal besiedeln. Die Tonga sind traditionell eine selbstversorgende und weitgehend egalitäre Gemeinschaft mit einer Subsistenzökonomie und einem komplexen kulturellen und sozialen System gewesen.

Bis zum Bau des Karibastaudamms (1955-1958) lebten die Tonga vornehmlich entlang den Ufern des Sambezi und an dessen Hauptzuflüssen. Sie betrieben semipermanenten Regenfeldbau und in der trockenen Jahreszeit Ufer-Landwirtschaft in ihren sog. Siligärten. Sie hatten ein agroökologisches System entwickelt, welches durch ökologische Fragmentierung und diversifizierten Anbau an ihre Umwelt angepaßt war.

Die Tonga hatten ein hochentwickeltes Kultur- und Sozialsystem, welches sie bis heute noch weitgehend praktizieren. Den gesellschaftlichen Mittelpunkt stellt die polygame Großfamilie dar. "Die Tongas gehören immer noch zu den Völkern in Zentralafrika mit der größten Unabhängigkeit, und sie sind diejenigen, die am eindeutigsten mit der alten Welt in Verbindung geblieben sind." (Zitat aus E. Colson, 1960)

Die Gwembetonga haben nie viel von der Entwicklung Sambias profitiert. Die britische Kolonialadministration investierte in Gwembe nicht, da das Land viel zu uninteressant für den Ausbau einer Infrastruktur war. Dennoch hat sich das soziale und wirtschaftliche Gefüge der Tonga besonders in diesem Jahrhundert durch einige einschneidende Ereignisse verändert.

Der Bau des Karibastaudammes hat sich wohl bis heute am folgenschwersten ausgewirkt. Tausende von Menschen verloren ihr fruchtbaren Land, sie wurden in ihnen fremde Gebiete umgesiedelt, Familien und Dorfgemeinschaften wurden zerissen und zerstört. Das Problem des knapper werdenden Ackerlandes wurde zu dieser Zeit zum ersten Mal aktuell und hat sich seitdem in den folgenden Jahren noch wesentlich verschärft.

1.2. Aufgaben und Ziele des GSDP.

Die sambianische Regierung und die Gossner Mission Berlin kooperieren seit 1972 im Gwembe-Süd Entwicklungsprojekt (GSDP) zur Verbesserung der wirtschaftlichen und sozialen Bedingungen der Menschen in Gwembe-Süd. Schwerpunkte der Entwicklungsarbeit sind die Förderung der lokalen Nahrungsmittelproduktion und des Handwerks sowie Verbesserungen im Ausbildungs- und Gesundheitswesen.

Das GSDP war bis 1983 direkt dem Landwirtschaftsministerium in Lusaka unterstellt. Im Zuge der Dezentralisierung der sambianischen Verwaltung wurde 1983 der Gwembe-Distrikt dafür zuständig und verantwortlich. Das Projekt wurde Teil eines neuen Gesamtkonzeptes, einem integrierten ländlichen Entwicklungsprojekt zur Entwicklung des gesamten Gwembe Distrikts.

Das GSDP umfaßt folgende Projektkomponenten:

- drei Kleinbewässerungsprojekte
- ein Beratungsprogramm für die Bewässerungsprojekte
- ein Saatgutproduktionsprogramm
- ein Frauenberatungsprogramm
- Werkstätten für Ausbildungsprogramme
- ein Brunnenbauprogramm
- ein Straßenbauprogramm
- eine Kreditgenossenschaft
- eine Konsumgenossenschaft
- ein Selbsthilfeprogramm zur Unterstützung lokaler Initiativen (VSP = Valley Self Help Promotion)
- Sammlung und Vertrieb von lokalen Handwerks- und Kunstgegenständen
- Kirchenarbeit.

Die Gossner Mission leistet im GSDP finanzielle und technische Hilfe. Dazu entsendet sie Experten, die unterstützende und beratende Funktion haben. Geleitet von christlichen Grundsätzen drückt sich die entwicklungspolitische Vorstellung der GM im partizipatorischen Ansatz aus. Die direkte und unmittelbare Beteiligung der Bevölkerung ist die wichtigste Voraussetzung für jede Projektarbeit. Die einzelnen Projekte müssen sich organisch in die vorhandenen Lebensbedingungen einpassen und von den Betroffenen aktiv und weitgehend selbst gestaltet werden. Die Eigeninitiative der Bevölkerung soll gestärkt werden, um einen dynamischen Entwicklungsprozeß in Gang zu setzen.

1.3. Organisation des GSDP.

Durch einen organisatorischen Aufbau des Projekts, der die enge Zusammenarbeit zwischen sambianischen und ausländischen Mitarbeitern des GSDP und vor allem Mitbestimmung und Entscheidungsgewalt auf sambianischer Seite betont, wird versucht, dem partizipatorischen Ansatz Rechnung zu tragen.

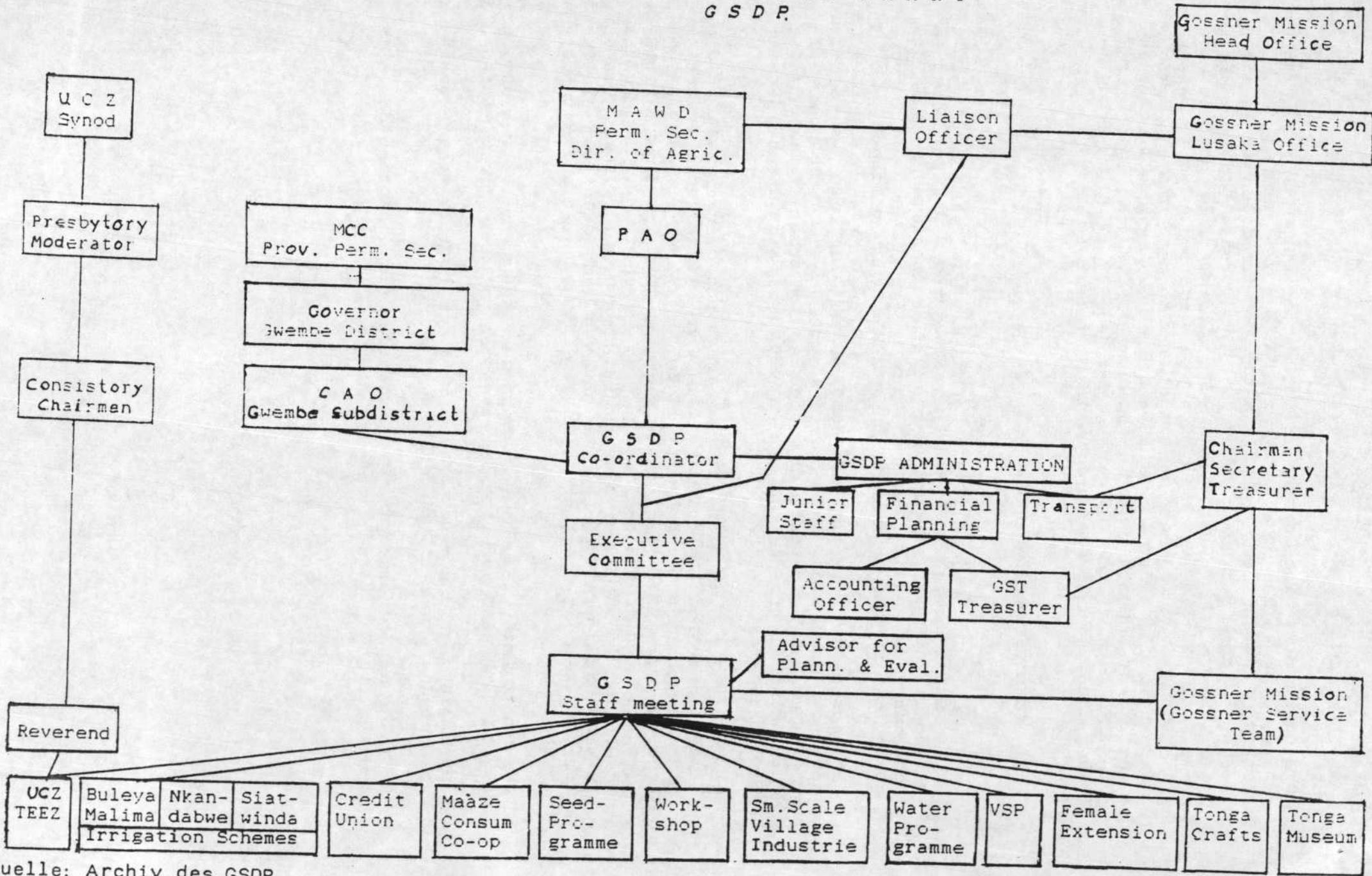
Die personelle Besetzung des GSDP besteht zur Zeit aus 25 Mitarbeitern, darunter sechs ausländische, die zum Gossner Service Team (GST) gehören und von der GM bezahlt werden. Die sambianischen Mitarbeiter werden von der sambianischen Regierung finanziert.

Die zentrale Einrichtung ist die Personalvollversammlung, die einmal monatlich stattfindet. Alle Projektmitglieder erstatten hier Bericht über erfolgte Tätigkeiten, Erfolge und Probleme ihrer Arbeit. Ziel der Vollversammlung ist der Informationsaustausch und die Koordination der verschiedenen Tätigkeiten innerhalb und zwischen den Projektkomponenten. Dieses Plenum entwirft außerdem Vorgaben für das von ihm gewählte Exekutivkomitee, welches die höchste Entscheidungsgewalt auf Mitarbeiterebene hat.

Der Koordinator arbeitet im Bereich Planung und Organisation eng mit dem GST-Vorsitzenden zusammen. Dieser untersteht dem Liaison officer in Lusaka, der die höchste Vertretung der GM in Sambia ist und das personelle Bindeglied zwischen sambianischer Regierung und GM Berlin darstellt.

Im folgenden Diagramm ist der organisatorische Aufbau des GSDP dargestellt.

Abb.1: ORGANISATIONAL CHART
GSDP.



Quelle: Archiv des GSDP.

2. MEINE AUFGABE IM GSDP: ERMITTLEMENT VON FUNKTION UND WIRKUNGSWEISE DES NKANDABWE BEWÄSSERUNGSPROJEKTS (NBP).

Drei wichtige Projektkomponenten sind die Kleinbewässerungsprojekte Siatwinda, Buleya Malima und Nkandabwe. Diese sind mit unterschiedlicher Technik und Organisation ausgestattet. Die ersten beiden wurden unter GSDP vor fünfzehn bzw. sieben Jahren errichtet, während das Nkandabwe Bewässerungsprojekt noch unter der britischen Kolonialadministration errichtet wurde. Im Gegensatz zu den beiden anderen Bewässerungsprojekten liegen zum NBP weder verlässliche noch systematische Daten und Aufzeichnungen zu Werdegang und Effizienz des Projektes vor.

2.1. Das NBP als Komponente des GSDP.

2.1.1. Lage des NBP's.

Das Bewässerungsprojekt liegt im Subdistrikt Sinazongwe, etwa 350km von Lusaka und 20km von Sinazongwe, dem Sitz der Boma entfernt.

Das NBP ist mit der Hauptstraße über eine dort endende Teerstraße verbunden. Die achtundachtzig am Projekt partizipierenden Bauern kommen aus acht im Umkreis von 10km liegenden Dörfern. Die Bevölkerung im Einzugsgebiet des NBP's umfaßt 1100 Einwohner und lebt zu 75% ausschließlich von der Landwirtschaft, die noch weitgehend subsistenzorientiert ist.

Die Hauptanbaufrucht und Grundnahrungsmittel in der Region ist der Mais. Daneben werden verschiedene Hirse- und Sorghumarten und auch Erdnüsse angebaut. Die wichtigste Verkaufsfrucht ist die Baumwolle, die in unterschiedlichem Umfang von fast allen Bauern angebaut wird.

Die Hauptprobleme der Bodennutzung in der betrachteten Region liegen in der stark abnehmenden Bodenproduktivität bei gleichzeitig stetig anwachsender Bevölkerung und damit einhergehender Landverknappung. Starke Abholzung und während der neunmonatigen Trockenzeit brachliegende Flächen führten schon in den vergangenen Jahren zu enormen Landverlusten durch Grabenerosion, die in rasantem Tempo voranschreitet.

2.1.2. Geschichte des NBP's.

Das NBP wurde in den Jahren 1956 bis 1958 vom Department für Wasserangelegenheiten, Monze, mit Geldern der Gwemberehabilitation während der Vorbereitungen für die Umsiedlungen errichtet.

Dreißig Familien sollten mit je 0,1 Hektar bewässerbarer Fläche für ihr verlorenes Land entschädigt werden, zumal sie nun auf engerem Raum ihre Nahrung produzieren mußten.

Der Nkandabwe-Fluß wurde durch ein Zementwehr aufgestaut und das Wasser in Rohren per Gravität auf die tiefer gelegenen Felder gebracht.

1964 entstand direkt neben dem Wasserstaubecken eine Kohlegrube. 1967 wurde, als der Grundwasserspiegel in der Kohlegrube anstieg, das Stauwehr am Nkandabwe-Fluß von der 'Zambian Mine Company' gesprengt. Aber die Kohlegrube konnte nicht gerettet werden, denn unterirdische Quellen hatten den Wasseranstieg in der Kohlegrube verursacht und nicht der Stausee. Mit der Sprengung der Staumauer war auch das Ende des Bewässerungsprojekts angesagt. Die betroffenen Bauern wurden nie entschädigt.

1972 übernahm die GM im Rahmen des GSDP die Rehabilitierung des NBP's. Der technische Aufbau wurde etwas verändert und durch mehrmalige Erhöhung der Staumauer die bewässerbare Fläche auf 10 Hektar ausgedehnt.

Seit 1984 sind nun insgesamt 88 Bauern am Projekt beteiligt. Die durchschnittliche Parzellengröße liegt bei 0,1 bis 0,15 Hektar.

1979 wurde das Projekt von der Regierung unabhängig erklärt, da sie davon ausging, daß sich das Projekt nun selber trage.

2.1.3. Technik und Organisation des NBP's.

Der technische Aufbau und die Bewässerungstechnik, beruhend auf dem Gravitätsprinzip und der Furchenbewässerung sind im NBP recht einfach. Das gesamte System wird mit dem Wasser aus dem Kohlensee, der ehemaligen Grube, gespeist. Bei starkem Absinken des Wasserspiegels durch lang anhaltende Trockenheit werden zur Wasserförderung zwei manuell bedienbare Dieselpumpen eingesetzt. Dies geschieht etwa zwei Monate im Jahr.

Das Kanalsystem besteht aus einem 630 Meter langem auszementierten Hauptkanal und fünf kleineren, nur teilweise zementierten Nebenkanälen, die mit einer Gesamtlänge von 1510 Metern das Projektgebiet durchziehen. Der Wassereinfluß in den Hauptkanal geschieht durch manuelles Öffnen des Wehrs am Kohlensee. Am Hauptkanal befinden sich fünf Verteilerstationen, von denen die Nebenkanäle abgehen. Der Wassereinlaß in die Nebenkanäle wird mit einfachen Mitteln wie Ziegelsteinen oder großen Erdklumpen reguliert. Das Wasser gelangt von den Nebenkanälen auf die Parzellen, indem die Furchenwälle mit der Handhacke geöffnet werden.

Die Organisation der Wasserzuteilung geschieht unsystematisch nach dem Prinzip der gegenseitigen Absprache. Dadurch kommt es des öfteren zu erheblichen Problemen bzgl. einer gerechten Wasserverteilung unter den Bauern.

Für Verwaltung und Organisation des NBP's ist der Bauernrat, das sog. Farmers' Executive Committee (FEC), verantwortlich. Das FEC besteht aus sieben Mitgliedern unterschiedlicher Aufgabenbereiche. Die Mitglieder werden jährlich auf der Vollversammlung aller am Projekt beteiligten Bauern gewählt. Die Hauptaufgaben des FEC sind die Landvergabe im NBP, das Eintreiben und Verwalten von Wassergeldern, die Planung und Organisation von gemeinsam zu verrichtenden Arbeiten zu sog. 'communal work days' und die Informationsvermittlung. Das FEC hat keinen rechtlich anerkannten Status, es dient aber der Interessenvertretung der Bauern nach außen.

2.1.4. Ziele der Förderung des NBP's durch das GSDP.

Das NBP wird seit 1972 durch das GSDP in technischer, organisatorischer und finanzieller Hinsicht gefördert. Die Ziele der Hilfestellung sind:

- Verbesserung des Lebensstandards der lokalen Bevölkerung durch Steigerung der Einkommen und durch quantitative und qualitative Verbesserung der Ernährungssituation.
- Das Projekt soll nach anfänglicher Unterstützung unabhängig werden und zu einem ruralen Entwicklungsprozeß beitragen.

Als das NBP 1979 unabhängig erklärt wurde und von da an Organisation und Entscheidungsgewalt den Bauern selbst überlassen wurde, zog sich auch das GSDP weitgehend aus Nkandabwe zurück. Doch es kam bald zu großen Problemen und Konflikten auf dem NBP, die dazu führten, daß das Engagement der Bauern für ihr Projekt stark nachließ. Besondere Konfliktherde waren die Landvergabe, die Wassernutzung, die Veruntreuung von Geldern und Diebstahl. Das von den Bauern selbst gewählte FEC war nicht einflußreich genug, um zur Lösung der bestehenden Probleme beizutragen. Die Mehrzahl der Beteiligten entschied sich in dieser Konfliktsituation dafür, ihr Land nicht mehr zu bearbeiten.

Nachdem der größte Teil des NBP's von 1979 bis 1983 brachlag, schaltete sich die GM wieder verstärkt im NBP ein. Das primäre Ziel war, über eine Stärkung der Fähigkeiten und der Autorität des FEC eine gewisse Eigenverantwortung der Bauern für ihr Projekt zu initiieren.

2.2. Thematische Abgrenzung.

2.2.1. Aufgabenstellung.

Meine Aufgabe im GSDP bestand in der Untersuchung von Funktion und Wirkungsweise des Nkandabwe Kleinbewässerungsprojektes. Das Ziel der Untersuchung ist die Erstellung von Basisinforma-

tion zur Beurteilung des NBP's und dessen Beitrag zur ruralen Entwicklung.

Die Arbeit befaßt sich mit:

- der Untersuchung des Betriebssystems
- der Untersuchung von Meinung und Einschätzung der beteiligten Bauern zur Bedeutung des NBP's.
- der Untersuchung der sozioökonomischen Auswirkungen dieses Kleinbewässerungsprojekts.

Mit der Erfassung des Betriebssystems soll eine Basis zur Beurteilung der Funktionsweise und der Effektivität des NBP's geschaffen werden. Der zweite Teil stellt eine Verknüpfung von Teil eins mit Teil drei dar. Die Frage wie die Bemühungen einer Entwicklungsorganisation von den Betroffenen selbst gesehen und eingeschätzt werden, soll hiermit beantwortet werden. Der sozioökonomische Teil der Untersuchung wurde in Zusammenarbeit mit dem Anthropologen Dr. Habarath durchgeführt. In diesem Teil soll der Frage nachgegangen werden, wie sich ein Kleinbewässerungsprojekt auf regionale Einkommensstrukturen und Sozialstrukturen auswirkt.

2.2.2. Begründung.

Die Erfassung von Funktion und Wirkung eines Bewässerungsprojekts ist in engem Zusammenhang mit der ursprünglichen Zielsetzung des Projekts zu sehen. Die Folgen von Bewässerungsprojekten sind oft umstritten und lassen sich in ihrer Konsequenz häufig nicht mehr mit den intendierten Zielsetzungen vereinbaren.

Kleinbewässerungsprojekte haben im Rahmen eines nationalen Entwicklungsprozesses sicherlich eine andere Funktion als makrohydraulische Anlagen. Sie sollen eher zur Anhebung des Lebensstandards auf regionaler Ebene beitragen als daß sie makroökonomischen Zielsetzungen dienen.

Kleinbewässerungsprojekte sind nicht nur kostengünstiger und sparen einem Staat somit meist knappe Devisen, sondern sie sind aufgrund technischer Einfachheit und geringerer Komplexität leichter implementierbar, durchführbar und weniger abhängig von externen Kräften. Sie sollen durch trickle-down Effekte zu einem regionalen Entwicklungsprozeß beitragen und die aktive Anteilnahme der lokalen Bevölkerung an diesem Prozeß gewährleisten.

Im Zuge des Wandels entwicklungspolitischer Vorstellungen hat der partizipatorische Ansatz an Bedeutung gewonnen, und auch Kleinprojekte werden zunehmend häufiger den Großprojekten vorgezogen. Ob entwicklungspolitische Zielvorstellungen in Kleinprojekten besser realisiert werden können, indem von Groß auf Klein umgestellt wird, bleibt im Einzelfall zu untersuchen.

Das Nkandabwe Bewässerungsprojekt eignet sich besonders gut für eine derartige Untersuchung, nachdem es schon drei Jahr-

zehnte besteht und davon ausgegangen werden kann, daß sich bestimmte gesellschaftliche Strukturen, Einstellungen und Verhaltensweisen im Zeitablauf etabliert haben.

2.3. Arbeitsablauf und -methoden.

Die Erarbeitung des Themas geschah auf verschiedenen Ebenen mit verschiedenen Instrumenten. Aufgrund der Tatsache, daß über das NBP nur wenig abgesichertes Informationsmaterial vorliegt, kam der mündlichen Informationsvermittlung durch ausführliche Gespräche mit der lokalen Bevölkerung in der Vorbereitungsphase besondere Bedeutung zu. Wertvolle zusätzliche Informationen konnte ich vor allem in der Feldphase während meines Aufenthaltes im Dorf 'Siamagele' dadurch einholen, daß ich in unmittelbarer Nähe des Bewässerungsprojekts lebte. Wichtige Erkenntnisse konnte ich weiterhin aus ausführlichen Diskussionen mit politischen Vertretern des Distrikts und der Provinz sowie dem GSDP-Koordinator und seinen Mitarbeitern ziehen.

2.3.1. Die Vorbereitungsphase.

Für meine Arbeit wurden mir sämtliche Akten des GSDP-Archivs zur Verfügung gestellt. Nach der Durcharbeitung dieser mußte ich feststellen, daß weder die Geschichte des NBP's systematisch erfaßt ist, noch Datenmaterial zur ökonomischen Bewertung vorliegt. Es gibt zwar einige unregelmäßige Aufzeichnungen des dem NBP zugeteilten staatlichen Beraters, jedoch handelt es sich hier um rein willkürlich festgelegte Zahlen. So mit kann diesen keine Aussagekraft beigemessen werden und dieses Material kann nicht als Bewertungsgrundlage herangezogen werden.

Nach weiterem Literaturstudium (E. Colson, T. Scudder, J. Schulz u.a.), das der Vertiefung meines Verständnisses für Produktionsweise und Sozialstruktur der Tongagesellschaft diente, begann ich mit der ersten Informationssammlung zum NBP.

Dazu bin ich unterschiedlichste Stellen und Personen angegangen, die in irgendeiner Weise mit dem NBP zu tun haben. Ich habe Sachinformationen, Meinungen und Einschätzungen eingeholt von Bauern in- und außerhalb des NBP's, von lokalen Schlüsselpersonen und landwirtschaftlichen Beratern, von Behörden und Mitarbeitern des GSDP's.

Außer den Regierungsangestellten und den GSDP-Mitarbeitern, die der englischen Sprache mächtig sind, werden die Gespräche auf Tonga geführt. Deshalb eignete ich mir Grundkenntnisse dieser Sprache an und engagierte gleichzeitig einen Dolmetscher, der mich bei allen Gesprächen und Treffen begleitete.

Weiterhin wurde ich sogleich in der ersten Woche von Mrs. Herlitz, die im GSDP für mich verantwortlich war, bei den Bauernräten der drei Bewässerungsprojekte vorgestellt. Damit bekam ich die Erlaubnis, an den wöchentlich stattfindenden Sitzungen der FEC's regelmäßig bis zum Ende meines Aufenthaltes teilzu-

nehmen. Durch diese sofortige Bekanntschaft mit den jeweiligen Vertretern der Bewässerungsprojekte wurde nicht nur mein Einblick in die aktuelle Situation auf den Projekten vertieft, sondern vor allem mein Zugang und Kontakt zu den Bauern von Anfang an erheblich erleichtert.

Durch den FEC-Sekretär des NBP's wurde ich alsdann bei den Dorfvorstehern (headmen) des Untersuchungsgebietes vorgestellt. Sie erteilten mir die Erlaubnis zur Durchführung meiner Arbeit in ihren Gebieten und sicherten mir ihre Kooperation zu. Die Dorfvorsteher gaben mir die Einwohnerlisten ihrer Gebiete und halfen mir bei der Organisation von Bauertreffen. Zu diesen Versammlungen wurden aus den jeweiligen Dörfern am NBP partizipierende und nicht partizipierende Bauern einberufen. In Gruppendiskussionen wurden schwerpunktmäßig Fragen zur Landwirtschaft (Bewässerungswirtschaft versus Regenfeldbau), Fragen zur Geschichte und Entstehung des Projekts und Fragen zu aktuellen Tatbeständen und Problemen erörtert.

Aufbauend auf diesen Informationen begann ich mit der Entwicklung der Instrumente für meine Untersuchung.

2.3.2. Die Fragebögen.

2.3.2.1. Vorgehensweise.

Zur qualitativen und quantitativen Messung von Zuständen, Aussagen und Verhaltensweisen erstellte ich einen standardisierten Fragebogen. Dieser enthält offene und geschlossene Fragen zu den drei Unterbereichen der Untersuchung.

Der Vorteil der offenen Frage liegt darin, daß Mißverständnisse und unerwartete Bezugssysteme des Befragten schnell offensichtlich werden. Die geschlossene Frage, die zwar bei der Aufnahmearbeit des Interviews' Erleichterung bringt, birgt jedoch die Gefahr der mangelnden Kontrollierbarkeit in sich, wenn nicht zusätzlich Fragen zur Überprüfung der geschlossenen Frage im Interview eingebaut werden. Aus diesen Gründen bevorzugte ich weitgehend die offenen Fragen.

Der Fragebogen wurde von einer unabhängigen dritten Person vom Englischen in das Tonga übersetzt, um Beeinflussung oder Verfälschung der Fragen durch den Dolmetscher im Feld auszuschalten. Nach der Dolmetscherschulung zur Situation standarisches Interview führte ich mit diesem Fragebogen den Pretest durch. In zufälliger Stichprobe wurden fünfzehn Personen interviewed.

Alle Interviews wurden neben meiner schriftlichen Aufzeichnung der Direktübersetzung im Feld gleichzeitig auf Band aufgenommen. Die Aufnahmen wurden im Anschluß von einer dritten Person ins Englische übersetzt. Dadurch hatte ich Kontrolle über Richtigkeit und Genauigkeit der Übersetzung des Dolmetschers und gewann außerdem wertvolle zusätzliche Informationen.

Der Fragebogen wurde nach der Durchführung der Pretests in zwei Punkten verändert, denn er wies gewisse Mängel auf.

1.: Fragen zur Ermittlung von naturalen und monetären Ernteerträgen mußten verändert werden, denn sie konnten von den Befragten nicht beantwortet werden. Ernteerträge werden nicht in Kilogramm gemessen, denn es gab bis dato keine Waage auf dem NBP. Für den Verkauf gebrauchliche Maßeinheiten sind Eimer, Tassen oder das Abzählen von Einheiten. Außerdem werden von keinem Bauern Aufzeichnungen zu Investitionen oder Einnahmen geführt, da der allergrößte Teil der Bauern weder lesen noch schreiben kann. Einnahmen aus dem Verkauf von Produkten des Bewässerungsgartens werden in der Regel sofort weiterverwendet auf den Kauf von Grundnahrungsmitteln.

Im überarbeiteten Fragebogen wurde mittels indirekten Fragen versucht, die Einkommenshöhe über die Einkommensverwendung festzustellen. Die Ertragshöhe konnte nur über ungefähre Abschätzungen der Menge der lokalen Bezugsgrößen ermittelt werden. Durch diese Überarbeitung wurde die Beantwortung der Fragen erheblich erleichtert.

2.: Der Fragebogen war zu umfangreich, die Dauer des Interviews belastete Konzentrationsfähigkeit und Interesse der Befragten. Deshalb mußte der Fragebogen gekürzt werden. Alle Fragen zum sozioökonomischen Teil der Untersuchung wurden herausgenommen. In Zusammenarbeit mit Dr. Habarath wurde ein weiterer standardisierter Fragebogen für stark strukturierte Interviews erstellt. Dieser Fragebogen diente allein dem sozioökonomischen Vergleich von am NBP partizipierenden und nichtpartizipierenden Bauern aus den verschiedenen Dörfern.

2.3.2.2. Ergebnis.

Für die Untersuchung wurden zwei umfangreiche Fragebögen erstellt. Der erste Fragebogen dient der Erfassung des Betriebsystems und der Einschätzung des NBP's durch die Bauern. Mit diesem Fragebogen wurden ausschließlich Projektbauern befragt. Der zweite Fragebogen wurde für einen sozioökonomischen Zensus hinsichtlich der Auswirkungen des NBP's konzipiert. Die Standards in diesem Fragebogen entsprechen der Situation von am NBP partizipierenden und nichtpartizipierenden Bauern. Die beiden Fragebögen sind im Anhang abgedruckt.

2.3.3. Die Stichprobe.

Die am NBP beteiligten Bauern kommen aus acht Dörfern. Da nicht alle Bauern befragt werden konnten, die Repräsentativität der Stichprobe aber gewährleistet sein muß, wurden folgende Indikatoren zur Auswahl bestimmter Dörfer für die Umfrage aufgestellt:

1. Die Entfernung des Dorfes zum NBP
2. Prozentualer Anteil Bewässerungsbauern an der Einwohnerzahl eines Dorfes.
3. Vergleichbarkeit der Dörfer bzgl. des zweiten Indikators.

Anhand dieser Indikatoren wurden die drei Dörfer 'Siamagele', 'Siamugande' und 'Chiaby' ausgewählt.

Abb.2: Darstellung der zur Stichprobe ausgewählten Dörfer.

	Entfernung zum NBP	Anzahl	Anzahl	Partizip.in %
		Einw	Partizip.	der Einw
Siamagele	0,5km	269	29	10,7%
Siamugande	3,0km	123	15	12,7%
Chiaby	7,0km	102	10	9,8%

Siamagele liegt dem NBP am nahesten, hat die höchste Einwohnerzahl und die höchste Zahl an Projektteilnehmern. Siamugande liegt weiter entfernt, die Anzahl der Einwohner und der Projektteilnehmer beträgt hier nur die Hälfte von Siamagele. Chiaby liegt vom NBP am weitesten entfernt, die Einwohnerzahl und Projektteilnehmerzahl ist der von Siamugande ähnlich.

2.3.4. Die Feldphase.

Während der Durchführung der Umfrage lebte ich im Dorf Siamagele, um meine Informationen aus den Interviews durch teilnehmende Beobachtung zu ergänzen. Dadurch wurde es mir möglich, einen wesentlich tieferen Eindruck und Einblick in das Sozialsystem, in Arbeitsabläufe und in aktuelle Probleme der zu untersuchenden Gemeinde zu bekommen.

Für die Durchführung der Interviews wurden die Bauern in drei Wohlstandskategorien eingeteilt. Die Einteilung von unterdurchschnittlich bis überdurchschnittlich wohlhabend geschah mit Hilfe von lokalen Schlüsselpersonen. Mit dieser Kategorisierung sollte die gleichmäßige Erfassung verschiedener Bevölkerungsschichten gewährleistet sein.

Zur Erfassung von Unterschieden in Ernährung und Einkommen wurden zu Beginn der Feldphase 25 Familien der drei Kategorien in den drei Dörfern angeleitet, über einen Monat täglich ihre Diäten und Ausgaben aufzuzeichnen. Diese Aufzeichnungen wurden in regelmäßigen Abständen kontrolliert.

Während der Feldphase wurden 46 von 88 Bauern, die am NBP partizipieren mit dem ersten Fragebogen befragt. Mit dem zweiten

Fragebogen wurden von 494 Einwohnern der drei Dörfer insgesamt 80 Einwohner befragt.

In der folgenden Abbildung wird die genaue Struktur der Umfrage nach Inhalt, Dörfern, Projektteilnehmern(=P) und Nichtteilnehmern(=N) dargestellt.

Abb. 3: Umfragestruktur nach Inhalt, Dörfern, und Art der Befragten

	Fragebogen 1	Fragebogen 2	Diäten u. Ausgaben
	P 24	P 24 N 15	P 7 N 6
Siamagele	14	13 12	3 3
Siamugande	8	7 9	3 3
Chiaby			

Insgesamt wurden 52,3% aller am NBP teilnehmenden Bauern zu Betriebssystem und persönlicher Einschätzung befragt. Zur sozioökonomischen Untersuchung wurden 16,2% der Einwohner der drei Dörfer befragt.

2.3.5. Die Evaluierung.

Die Auswertung des gesammelten Datenmaterials soll mit Hilfe des SPSS-Programms erfolgen. Da ich mit diesem Programm bisher keine Erfahrungen habe, wird es noch eine Weile dauern, bis ich mich darin eingearbeitet habe und eine endgültige differenzierte Analyse meiner Untersuchung möglich ist. Bisher erfolgte eine manuelle Mittelwertermittlung zu bestimmten Fragebereichen. Aus dieser sind Trends ersichtlich, die einige allgemeine Aussagen möglich machen, welche im folgenden Teil beschrieben werden.

3. ERGEBNISSE.

3.1. Das Betriebssystem.

Die Teilnahme der Bauern am NBP muß als eine zusätzliche Beschäftigung zum Regenfeldbau gesehen werden, da dieser die Haupteinkommensquelle für fast alle Bauern der untersuchten Region darstellt. Dadurch wird die Produktionsperiode und die Produktionsrichtung im Bewässerungsprojekt beeinflußt.

3.1.1. Produktionsperiode.

Im allgemeinen beginnt die Bodennutzung im NBP direkt nach der Regenzeit im März/April und endet mit Einsatz der Regenzeit im späten November bis Anfang Dezember. Die möglichen Pflanz- und Erntetermine im NBP gehen aus der folgende Abbildung hervor.

Abb.4: Mögliche Pflanz- und Erntezeitpunkte im NBP bei dreimaligem Umtrieb.

	Pflanzzeit:	Erntezeit:
1.Saison	Februar/März	Juli/August
2.Saison	Juli/August	Oktober/November
3.Saison	Oktober/November	Ende Januar

Obwohl es möglich ist, die Bewässerungsgärten über das ganze Jahr hindurch mit drei Ernten zu nutzen, produziert der Großteil der Bauern nur zwei Ernten. Weniger als 10% der Bauern nutzen die drei Vegetationsperioden aus.

Da die Bewässerungswirtschaft eine sehr arbeitsintensive Betätigung ist, wird die Intensität der Bodennutzung im NBP durch die Arbeitskraftverfügbarkeit in den einzelnen Familien determiniert. Die Familiengröße, die Anzahl und Größe von Regenfeldbaufeldern und die Entfernung dieser Felder von der Wohnstätte bestimmen die Verfügbarkeit von Arbeitskräften.

Arbeitskräftemangel stellt zu 90% den limitierenden Faktor für eine dritte Nutzung im NBP dar. Dies trifft besonders für monogame Bauern zu, aber auch für polygame Bauern, die über mehrere und größere Felder verfügen und somit einen höheren Arbeitskraftbedarf haben. Etwa 10% der Bauern verfügen auch über eine zweite Wohnstätte in den Bergen, wo sie während der Regenzeit leben, um ihre Felder zu bewirtschaften.

3.1.2. Produktionsrichtung.

Im NBP werden Gemüse und Mais angebaut, vereinzelt gibt es auch einige Dauerkulturen wie Bananen, Orangen und Mangobäume.

In der ersten Saison werden wegen noch relativ niedriger Temperaturen ausschließlich Gemüse angebaut. Die wichtigste cash-crop dieser Saison ist die Tomate. Sie nimmt mehr als 50% der gesamten nutzbaren Fläche ein. Daneben werden Kohl, Raps, Zwiebeln und Bohnen zu Verkaufs- und Konsumzwecken angebaut. Wegen unzureichender Saatgutverfügbarkeit bauen nur wenige Bauern Okra, Auberginen, Karotten und Kürbisse an. Die Produktion dieser Saison ist auf Verkaufs- und Konsumzwecke ausgerichtet.

Die Frucht der zweiten Saison ist der Mais, der als Grünmais oder als Trockenmais geerntet wird. In Abhängigkeit von der Höhe der Ernteerträge im Regenfeldbau wird dieser Mais entweder als Grünmais verkauft oder er wird getrocknet und dient der Aufstockung der Eigenbestände. Besonders in Familien der

unteren Einkommenskategorie wird dieser Mais dem Eigenkonsum zugeführt.

Die wenigen Farmer, welche die dritte Saison nutzen, bauen ausschließlich Grünmais an. Dieser trifft als beliebtes Nahrungsmittel besonders zu dieser Jahreszeit auf eine hohe lokale Nachfrage.

3.1.3. Produktionsweise.

Die Produktionsweise im NBP ist charakterisiert durch einen sehr geringen Mechanisierungsgrad und einen ungeregelten Einsatz von biologisch-technischem Fortschritt.

Die Bodenbearbeitung wird mit der Handhacke und dem Ochsenpflug durchgeführt. Zum Pflügen setzt sich die tierische Anspannung vermehrt durch. Die Unkrautbekämpfung geschieht ausschließlich mit der Handhacke. Der Herbizideinsatz ist bisher unbekannt, da diese lokal auch kaum verfügbar sind. Hohe Ernteeinbußen durch unzureichende Unkrautbekämpfung sind im NBP häufig zu beobachten.

Eine Nährstoffanreicherung mit tierischem Dung, der vor der Aussaat in den Boden eingebracht wird, ist weit verbreitet. Eine systematische Gründüngung mit dazu geeigneten Pflanzen wird nur von einigen wenigen Bauern durchgeführt. Mineraldünger (NPK-Dünger in zwei verschiedenen Nährstoffgehaltsstufen) werden nur auf Mais ausgebracht. Für Gemüsepflanzen wird die organische Düngung bevorzugt. Als Begründung dafür werden Qualitätsaspekte angegeben neben geringer Verfügbarkeit und hohen Preisen für Mineraldünger.

Der Pflanzenschutz stellt ein besonderes Problem dar. Hohe Ernteverluste treten durch Pflanzenkrankheiten auf, die über das ganze NBP weit verbreitet sind. Alle Bauern gaben starken Schädlingsbefall ihrer Pflanzen an. Blattläuse, Grüne und Weiße Fliege, Fruchtbohrer, Heuschrecken und vor allem Nematoden reduzieren die Ernteerträge erheblich. Zur Bekämpfung wenden die meisten Farmer Insektizide an, die sie über ein besonderes Verteilungssystem eigens für den Baumwollanbau zugeteilt bekommen.

3.1.4. Bezug und Absatz.

Der Bezug von landwirtschaftlichen Betriebsmitteln und die Vermarktung sind für das NBP genauso wie für die Nahrungsmittelproduktion im Regenfeldbau ungenügend entwickelt.

3.1.4.1. Der Bezug von Betriebsmitteln.

Düngemittel und Pflanzenschutzmittel sind lokal nicht verfügbar. Die Bauern versuchen deshalb, die für den Baumwollanbau zur Verfügung gestellten Mengen dort äußerst sparsam anzuwenden. Auf diese Weise haben sie zumindest geringe Mengen an Dünger und Insektiziden für die Nahrungsmittelproduktion im Bewässerungsbau übrig.

Die Verfügbarkeit von Saatgut ist wesentlich besser, da gerade hier durch das GSDP große Hilfe geleistet wird. Fast alle Bauern beziehen ihr Saatgut über das GSDP. Nur etwa 10% der Bauern züchten eigenes Saatgut und weitere 10% kaufen ihr Saatgut in der 80km entfernt liegenden Stadt Choma.

Probleme bestehen allerdings in der rechtzeitigen Bereitstellung zur termingerechten Aussaat. Durch häufig verspätete Auslieferung kommt es zu verspäteter Aussaat und somit zu verengerten Ernteerträgen.

3.1.4.2. Die Vermarktung.

Die Vermarktung der Produktion des NBP's geschieht mit Ausnahme der Hauptanbaufrucht Tomate zum größten Teil auf lokaler Ebene. Tomaten werden wegen rascher Marktsättigung bei hohem Angebot in nur geringem Umfang lokal verkauft.

Der wichtigste Umschlagplatz für Tomaten ist der Markt in Choma. Jedoch haben die Bauern des NBP kein geeignetes Transportmittel um den Markt zu erreichen. Somit sind sie auf GSDP-Fahrzeuge angewiesen, soweit diese verfügbar sind. Andere Transportmöglichkeiten stehen nur in äußerst begrenztem Umfang zu Verfügung.

Weiterhin kommen sporadisch aus größeren Städten organisierte Händler, die große Mengen zu guten Preisen abnehmen. Allerdings kommen diese nur unregelmäßig, entsprechend der Marktlage in den großen Absatzzentren.

Jährlich verderben große Teile der Tomatenernte, da entweder wegen mangelnder Transportmöglichkeiten die Nachfragezentren nicht erreicht werden oder auch erreichbare Märkte schon gesättigt sind.

Unter dem Gesichtspunkt der Ressourcenknappheit und vom ökonomischen Standpunkt der Gewinnmaximierung ist die Vermarktung der Produktion des NBP's das größte ungelöste Problem, was auch von den Bauern so gesehen wird.

95% der befragten Bauern sehen die einzige Lösung dieses Problems in der Verbesserung der Transportsituation. Dabei vertreten sie die Ansicht, daß sie ein projekteigenes Fahrzeug für die Vermarktung benötigen, welches über die GM finanziert werden sollte. Obwohl die Farmer durch nicht unbeträchtliche Ernteverluste erhebliche Einkommenseinbußen hinnehmen müssen, haben sie bisher noch nichts unternommen, um ihr Problem zu lösen.

Da offensichtlich große Ungleichgewichte bestehen zwischen Produktion und tatsächlichen Absatzmöglichkeiten, steht eine Hinterfragung der Produktionrichtung an. Eine Änderung der Produktionsrichtung mit Anbau von Produkten, die weniger schnell verderblich und besser zu lagern sind und eine gleichzeitige Diversifikation der Produktion könnten hier sicherlich Abhilfe schaffen. Die Einführung von anderen Produkten, beispielsweise der Kartoffel, wäre auch aus pflanzenbaulicher Sicht wegen zunehmender Bodenmüdigkeit und Schädlingsdruck aufgrund des einseitigen Anbaumusters im NBP empfehlenswert.

3.1.5. Einkommen der Bauern aus dem NBP

Entsprechend den Informationen der Projektbauern liegt die Einkommensspanne aus einem Bewässerungsgarten zwischen 500 und 3000 Kwacha im Jahr. Über 50% der Befragten gaben allerdings Beträge um die 1500 Kwacha an. Da keiner der Bauern über seine Einkünfte oder Ausgaben Buch führt, und auch keine Ernteaufzeichnungen erfolgen, können diese Beträge nur als Anhaltswerte gesehen werden. Die Einkommensverwendung erfolgt entsprechend der ökonomischen Stellung der jeweiligen Familie zu unterschiedlichen Zwecken.

Jüngere Familien und Familien der unteren Einkommensgruppe sind stark abhängig von diesen Einkommen, die sie hauptsächlich auf den Kauf von Nahrungsmitteln verwenden. Mais, Salz, Zucker und Speiseöl wurden am häufigsten in dieser Gruppe erwähnt, daneben auch der Erwerb von Kleidung.

Die mittlere Einkommensgruppe verwendet ihre Gewinne gleichwertig zum Kauf von Nahrungsmitteln sowie für den Kauf von Kleidung, weiterhin für den Kauf von Rindern, Betriebsmitteln und die Bezahlung von Schulgeldern. Nur in der höchsten Einkommensgruppe wurde zusätzlich auch das Sparen von Geld erwähnt. Die Bezahlung von Brautpreisen wurde in allen Einkommensgruppen erwähnt.

3.1.6. Ökonomische Betrachtung des NBP's.

Das NBP verfügt über eigene minimale Fonds, die von allen partizipierenden Bauern zu gleichen Teilen aufgebracht werden.

In ökonomischer Hinsicht ist das Projekt zumindest soweit selbsttragend, als daß Transportkosten, die bei der Vermarktung und bei Besorgungen von Materialien für kleinere Zaun- und Kanalreparaturen anfallen, sowie die Betriebskosten für die Dieselpumpen und der Pumpwart aus Eigenkapitalbeständen getragen werden.

Größere Investitionen wie die Rehabilitierung des Kanalsystems oder die Anschaffung eines projekteigenen Fahrzeuges können aus den Kapitalbeständen des NBP's nicht finanziert werden.

Eine grobe Einschätzung des Produktionswertes des NBP's ergibt sich ausgehend von folgenden Daten:
1500 Kwacha Jahreseinkommen
400 Kwacha variable Kosten der Produktion
25% Eigenkonsum an der Gesamtproduktion.

$$1500 - 400 = 1100 \times 88 = 96.800 : 4 = 24.200 + 96.800 = 120.000 \text{ Kwacha}$$

Bei den angenommenen Daten liegt der jährlich erzeugte Produktionswert also bei 120.000 Kwacha. Die Produktion des NBP's könnte allerdings wesentlich höher sein. Limitierend wirken hier, wie schon erwähnt, Unzulänglichkeiten im Betriebsmittelbezug, in der Vermarktung, aber auch hohe Wasserverluste durch den schlechten Zustand des Kanalsystems.

Eine Steigerung der Produktivität des NBP's durch erneute Investitionen seitens des GSDP's wäre sicherlich erreichbar. Investitionen von außen sind aber, wenn das Ziel der 'self-reliance' erreicht werden soll, in Frage zu stellen. Es bliebe eigentlich zu erwarten, daß die NBP Bauern zuerst ihre eigenen Fonds aufstocken.

3.2. Selbstbild der Bauern und deren Einschätzung des NBP's.

Generell kann gesagt werden, daß sich die am NBP partizipierenden Bauern ihrer besseren Position gegenüber den Bauern ohne Bewässerungsgarten bewußt sind. Sie fühlen sich privilegiert durch die Projektmitgliedschaft. Sie zeigen fast alle eine starke Verantwortung gegenüber dem NBP und auch gegenüber ihrer Gemeinde.

Gemeinsame Arbeiten werden zu sog. 'communal work days' auf den Aufruf des FEC durchgeführt. Es handelt sich dabei um Reparaturen von Kanälen, Zäunen, um das Schneiden von Bäumen und ähnliches. Die Teilnehmerquote zu diesen Arbeitstagen liegt nach Auskunft des FEC und eigenen Beobachtungen bei mehr als 90%. Ein unentschuldigte Fernbleiben von diesen Arbeiten wird vom FEC mit einer Geldstrafe belegt und führt im Wiederholungsfall zum Ausschluß vom NBP.

Dieses gemeinsame Verrichten von Arbeiten wird von 95% der Befragten als notwendig und produktiv angesehen. Sie halten es für äußerst wichtig sich daran zu beteiligen, nicht nur um nicht vom NBP ausgeschlossen zu werden, sondern weil sie das NBP als ihre eigene Sache ansehen, für die sie sich verantwortlich fühlen. "We like to work together, because we are a community. We gain something from our work, because we work for ourselves."

Auch das FEC wird zu 98% positiv gesehen, denn die Mitglieder des FEC organisieren, beraten und unterstützen die Bauern und fördern somit die Zusammenarbeit.

Die Bauern fühlen sich aber nicht nur für ihr Projekt verantwortlich, sondern auch für diejenigen Gemeindemitglieder, die keinen Garten im Bewässerungsprojekt haben. Diese können im NBP Gemüse einkaufen, um es auf lokalen Märkten dann weiter zuverkaufen. Die Betrachtung von Produktpreisen im NBP, die für verschiedene Abnehmer unterschiedlich hoch sind, gibt Einblick in ein differenziertes Verteilungssystem.

Abb.5: Tomatenpreise in Kwacha/Einheit für verschied. Abnehmer.

	Preis für Konsum	Preis für Verkauf
1. Familienang.	0	10
2. Abn. der unterd. schn. Eink. gruppe	0	10
3. Abn. anderer Eink. gruppen	15	20
4. org. Händler	—	35

Die Ursache für die niedrigen Verkaufspreise für direkte Familienangehörige ist im Sozialsystem der Tonga zu sehen, welches auf sozialer Absicherung durch gegenseitige unentgeltliche Hilfe innerhalb der Familie basiert. Zur unterdurchschnittlichen Einkommensgruppe Gehörige genießen in der untersuchten Region gleiche Privilegien wie engste Familienangehörige. Dadurch soll diesen die Möglichkeit eingeräumt werden, ihre Familien zu ernähren und durch eine höhere Handelsspanne ein gewisses Einkommen zu erwirtschaften. Durch günstigere Einkaufspreise im NBP wird dem ökonomischen Status dieser Menschen entsprochen. "We have to share, and we have to help those, who have less than ourselves". "We are responsible, because we have something the others don't have".

Die Projektbauern betrachten sich selbst als privilegiert insofern, als daß sie in der trockenen Jahreszeit Nahrungsmittel produzieren können und darüber zusätzliche Einkommen beziehen. Ihre privilegierte Stellung schafft ihnen bzw. ist im Rahmen ihres gesellschaftlichen Kontextes verbunden mit der Verpflichtung zu teilen.

98% der Befragten sind der Meinung, daß das NBP einen wichtigen Beitrag leistet zur Entwicklung der gesamten Region und nicht nur den Beteiligten dient. "We are feeding the whole community by producing food, and we give food to those who don't have money. They make money with our produce, so that they can buy their own food". Lediglich 2% der befragten Bauern waren der Meinung, daß das NBP nur den partizipierenden dient.

3.3. Sozioökonomische Wirkungen des NBP's.

In der heutigen Togagesellschaft, die bis vor noch nicht allzu langer Zeit eine egalitäre Gesellschaft war, wird der soziale Status eines Menschen inzwischen weitgehend von dessen ökonomischer Stellung bestimmt. Deshalb wurden mit dem sozioökonomischen Zensus Familien, die am Bewässerungsprojekt teilnehmen verglichen mit solchen, die nicht teilnehmen.

3.3.1. Betrachtung der ökonomischen Wirkung.

Die folgenden Tabellen stellen Mittelwerte dar zu Anzahl Felder, Ernteerträgen und Viehbeständen von Projektbauern(P) und Nicht-Projektbauern(N).

Abb.6: Felder und Erträge in den drei Dörfern.

	CHIABY		SIAMAGELE		SIAMUGANDE	
	P	N	P	N	P	N
Felder(Anzahl)	4,0	2,2	3,4	2,7	3,1	2,7
Mais(Schlitten)	9,6	6,2	13,9	4,0	3,3	2,3
Hirse (")	0,4	0,8	0,8	0,04	0	0,3
Sorghum (")	1,2	1,3	1,4	0,06	0,3	0,5
Kolbenhirse(")	0,8	1,5	0,9	0,7	2,3	1,1
Baumw.(Säcke)	26,1	12,0	28,0	12,8	13,5	9,2
Baumw.(i.Kwacha)	3137	1447	3360	1536	1620	1107

Aus der Darstellung geht hervor, daß die Projektbauern über eine höhere Anzahl von Feldern verfügen. In der Maisproduktion erzielen die Bauern mit Bewässerungsgarten höhere Erträge, in Siamagele sogar mehr als das Dreifache. Die Produktion der verschiedenen Hirsearten ist nur in Chiaby bei Nichtprojektbauern höher, in Siamagele und Siamugande ernten die Projektbauern mehr. Die naturalen und monetären Erträge der Baumwolle liegen wiederum in allen drei Dörfern bei den Projektbauern höher.

Die Betrachtung der Viehbestände ergibt ein ähnliches Bild. Die Projektbauern besitzen wesentlich mehr Rinder und auch mehr Zugochsen, mit Ausnahme der Nichtprojektteilnehmer von Siamugande, die über eine höhere Zahl von Ochsen verfügen. Bei den Kleintieren Ziegen, Hühnern und Perlhühnern ergibt sich ein etwas differenzierteres Bild. In Chiaby besitzen die Projektbauern wesentlich mehr Tiere, in Siamagele sind die Unterschiede zwischen den zwei Gruppen wenig ausgeprägt, und in Siamugande haben die Nichtprojektbauern mehr Kleintiere als die NBP-Bauern.

Abb. 7: Viehbestände in den drei Dörfern.

	Chiaby		Siamagele		Siamugande	
	P	N	P	N	P	N
Rinder (Anzahl)	20,9	3,7	12,7	3,3	8,1	3,7
Ochsen (")	2,6	0,8	2,2	0,6	2,4	3,7
Ziegen (")	9,1	2,1	4,5	5,3	2,5	4,1
Hühner (")	5,1	1,5	12,8	11,6	4,5	5,0
Perlhühner(")	10,8	1,6	2,0	0,5	0	0

Insgesamt läßt sich feststellen, daß in den drei Dörfern die Bauern des NBP's über mehr Anbauflächen verfügen, mehr an Nahrungsmitteln produzieren und höhere Erträge aus dem Verkaufsfruchtanbau erzielen. Im Vergleich zu den Bauern ohne Bewässerungsgarten verfügen sie außerdem über wesentlich größere Rinderbestände, in den Kleintierbeständen sind die Unterschiede allerdings weniger stark ausgeprägt.

3.3.2. Betrachtung der sozialen Wirkung.

Wie aus dem ökonomischen Zensus hervorgeht, sind die am NBP partizipierenden Bauern gegenüber den nicht partizipierenden in ihrer ökonomischen Position eindeutig überlegen.

Es ist nun nicht eindeutig nachweisbar, daß das NBP zu den bestehenden Wohlstandsunterschieden in der untersuchten Region geführt hat. Denn in den letzten dreißig Jahren gab es hier mehrere Einflußfaktoren, die auf eine unterschiedliche Einkommensverteilung hingewirkt haben.

Eindeutig feststellbar hindoch bleibt die Tatsache, daß ökonomisch besser gestellte Bauern auch eine höhere soziale Position einnehmen. Gesellschaftliche Institutionen, politische Funktionen und Ämter werden auf regionaler Ebene von den wohlhabenderen Bauern getragen. Diese Bauern gehören alle zum NBP.

In diesen Institutionen werden Entscheidungen gefällt, die weit in das soziale Leben hineinragen. Die Entscheidungen werden in der Regel entsprechend der Interessenslage der Entscheidungsträger gefällt. Das bedeutet, daß das NBP bzw. die daran partizipierenden auf regionalpolitischer Ebene entscheidende Einflußbereiche gefunden haben.

Die soziale Differenzierung einer Gesellschaft wird sicherlich beschleunigt und gefördert, dadurch daß einigen wenigen Gesellschaftsmitgliedern die Möglichkeit zur Einkommenssteigerung gegeben wird und anderen nicht. Über die höheren Einkommen wird diesen der Zugang zu weiteren Möglichkeiten eröffnet, der anderen verschlossen bleibt.

Für viele Bauern des NBP trifft dieser Zusammenhang zu. Dadurch, daß sie zu ihren Einkommen aus dem Regenfeldbau zusätzliche Einkommen erwirtschaften können, stehen ihnen Investitionsmöglichkeiten offen, die anderen verschlossen sind.

In der betrachteten Region stellt der Viehbesitz das höchste soziale Prestige dar. Rinder dienen als "lebende Sparkasse",

sie werden in guten Zeiten gekauft und können in schlechten Zeiten oder zu Zeiten erhöhten Geldbedarfs verkauft werden. Oft dienen Rinder auch als Tauschmittel, z.B. zur Zahlung des Brautpreises. Die Investition der zusätzlichen Einkommen aus dem Bewässerungsgarten in Rinder erhöht nicht nur das soziale Ansehen, sie stellt auch eine zusätzliche existentielle Absicherung dar. Der Besitz von Zugochsen ermöglicht dem Bauern außerdem die Bearbeitung von größeren Flächen und hat somit arbeitssparende Wirkung.

Da der Arbeitskräftemangel in einer noch subsistenzorientierten Landwirtschaft in der Regel der limitierende Faktor für eine Ausdehnung der Produktion ist, -speziell für den Baumwollanbau in dieser Region- ist die Überwindung dieser Knappheit allen Bauern ein dringendes Anliegen. Durch höhere Einkommen kann mehr Geld zur Zahlung des Brautpreises ausgegeben werden und es können mehrere Frauen geheiratet werden. Eine höhere Kinderzahl bedeutet nicht nur höheres soziales Prestige, sondern auch die Verfügbarkeit über mehr Arbeitskräfte. Mit einer größeren Familie kann eine größere Fläche bearbeitet werden und somit wieder mehr Einkommen erwirtschaftet werden. Überschüssige monetäre Erträge werden auch auf die Einstellung von bezahlten Arbeitskräften während der Arbeitsspitzen verwendet.

In beiden Fällen bedeutet die Überwindung der Knappheit eine weitere Steigerung des Einkommens. Auch der verbesserte Zugang zu ertragssteigernden Betriebsmitteln aufgrund von verbesserten Kapitalverfügbarkeit hat die selbe Wirkung.

Die Bauern des NBP verwenden ihre Einkommen auch auf die Zahlung von Schulgeldern für ihre Kinder. In einem Land, in dem die Analphabetenquote noch bei über 50% liegt, eröffnet der Besuch einer weiterführenden Schule berufliche Möglichkeiten, die anderen verschlossen bleiben. Die Schulausbildung der Kinder dient den Eltern als eine zusätzliche Alterssicherung.

Die Überwindung von Knappheiten in der landwirtschaftlichen Produktion auf einzelbetrieblicher Ebene führt zu einem Anwachsen der Einkommensdisparitäten auf regionaler Ebene, wie es sich in den Ergebnissen des ökonomischen Zensus im vorstehenden Teil gezeigt hat. Mit den anwachsenden Disparitäten wird auch die soziale Differenzierung gefördert.

Obwohl das soziale Gefüge der im untersuchten Gebiet lebenden Menschen noch intakt ist, zeichnen sich die Folgen einer sozialen Differenzierung schon ab.

Abschließend bleibt daher zu sagen, daß durch das NBP bestehende ökonomische und soziale Unterschiede im Untersuchungsgebiet weiter verschärft werden. Durch die Teilnahme am Bewässerungsprojekt werden einzelnen Bauern der Region nicht nur Möglichkeiten zur Überwindung der Armut und zur Verbesserung ihres Lebensstandart gegeben, sondern auch Privilegien eingeräumt, die anderen Bauern der Region verwehrt bleiben, da diese aufgrund der beschränkten Kapazität eines Kleinbewässerungsprojekts am NBP nicht partizipieren können.

3.4. Zusammenfassung der Ergebnisse.

Das NBP stellt für viele Familien die Grundlage zur Existenzsicherung dar, besonders aber in Jahren, wenn die Maisernten aufgrund von Trockenheit sehr gering ausfallen. Durch das in Punkt 3.2. erwähnte Verteilungssystem wird weiteren, nicht am Projekt partizipierenden Familien die Möglichkeit aufgetan, Einkommen zu erwirtschaften. Obwohl die meisten Bauern angaben, daß der monetäre Ertrag aus den Bewässerungsgärten für sie wichtiger ist als der direkte Konsum der angebauten Früchte, hat sich die Ernährungssituation durch eine diversifiziertere Ernährung verbessert.

Das NBP ist bzgl. Organisation und Management weitgehend unabhängig von äußeren Kräften. Jedoch muß gesehen werden, daß ohne Unterstützung des FEC dessen Einfluß weniger stark ist, wie die Geschichte des Projekts gezeigt hat. Eine ökonomische Unabhängigkeit des NBP's ist insofern nicht erreicht worden, als daß notwendige Investitionen nicht aus eigenen Mitteln getätigt werden können.

Das NBP wird von den daran partizipierenden Bauern als äußerst wichtig für ihre Gemeinde eingeschätzt, da das NBP vielen Menschen eine Lebensgrundlage schafft, die sie ohne das Projekt nicht hätten.

Durch das NBP werden bestehende sozioökonomische Unterschiede zwischen Beteiligten und Nicht-Beteiligten verschärft. Der höhere Wohlstand der am NBP partizipierenden Bauern eröffnet diesen Einflußmöglichkeiten und Wachstumschancen im sozialen und wirtschaftlichen Bereich, zu denen andere Bauern der Region keinen Zugang haben.

QUESTIONNAIRE 1: THE FARMING SYSTEM AND THE FARMERS' VIEW OF
NKANDABWE IRRIGATION SCHEME

Interviewed.:

ID.nr.:

Village:

Sex:

Age:

Date:

1. Since when do you have the plot?

Year:

2. What months do you use the plot?

From ----- till -----

3. Why don't you use your plot the whole year?

4. Last year, what was your most important crop?

1st ----- why?-----
2nd ----- why?-----
3rd ----- why?-----
4th ----- why?-----
5th ----- why?-----

5. Why were these your most important crops?

6. Why didn't you grow ----- (not mentioned crops)?

7. What did you do with your most important crops (refer to 4)?

for own needs	for selling	for other uses
---------------	-------------	----------------

(kg/buckets)	(kg/buckets)	(kg/buckets)
--------------	--------------	--------------

1st-----
2nd-----
3rd-----
4th-----
5th-----

8. Is it better to sell your crops, or is it better to keep it for food?

selling:-----

keeping:-----

9. MARKETING

Who bought your crops?

-local people at the garden gate

-People at local markets (ex. Sinazene)

-people at outside markets (Choma, Liv.)

- traders
- others

10. Who payed the best prices?

- garden gate
- local markets
- outside markets
- traders
- others

11. Why don't you sell your crops only to those, who pay the best prices?

12. TRANSPORT

12) Is transport for selling your crops available?

Yes-----

No-----

Not always-----

13. If yes: What kind of transport?

14. How much money does it cost to transport one load of vegetable to-----?

15. How can the transport problem be improved?

INCOME AND EXPENSES

16. Why did you want the plot?
add. cash income-----
add. food.....
savings-----
others-----

17. How much money did you get from your plot?
(If no figure, ask for an estimation)

18. How much did you spent last month on:
food:

mealie meal----, salad,, salt, -----sugar, -----
fish----, kapenta----, cattle meat-----, goat meat-----
chicken meat----, bear----, other relish-----
-----, clothing----, soap----, med. treatm----,
transport----, funerals----, others-----
savings:-----

31. Who is organizing that work?

a) if FEC is mentioned: go on to 32
b) if FEC is not mentioned:
do you know the FEC? yes-----, no-----

32. Does it make you problems to go to the canal work?

yes-----

no-----

if answer is yes: Why?-----

33. Would you prefer to do that work on your own?

yes-----

no-----

if answer is yes/no: why?-----

34. Do you think the FEC is helpful?

yes----- go on: why?-----

no----- go on: Why and alternatives?-----

35. What do you think about farmers, who don't come to the communal work? Why do you think they don't come?

36. What is happening to those farmers?

37. What other problems do you have on your plot except water and transport?

- pests and diseases
- seeds not available
- fertilizer not available
- insecticides not available
- soil fertility
- others

38. Do you use fertilizer?

no-----, go on: Why not ~~or vegetable?~~-----

yes-----, go on: Where do you get it from?-----

39. Do you use organic manure?

no-----, go on: Why not?

yes-----, go on: What kind?

- cattle manure
- ~~cow~~ chicken manure
- green manure
- compost
- others

CROP ROTATION, PESTS AND DISEASES, SEEDS

40. a) Where did you put your tomatoes (----etc.) last year?

b) Where do you plan to put it next year?
go on with beans, onions, -----etc.

indicate: -knows crop rot. well
-is practising crop rot.
-knows crop rot. a little bit
-tries to practise c.r.
-does not know c.p.
-does not practise c.p.

c) if does practise c.p.;
who explained you crop rotation?-----

d) Why Crop rot?:
41. Do you have problems with pests and diseases?

no-----
yes-----

42. if yes: How are you fighting pests a. diseases in the moment?

if is not fighting: Why not?

43. What is the origin of so much pests a. diseases here?

44. Where do you get your tomato seeds from? -----

"	"	"	"	"	onion	"	"	?	-----
"	"	"	"	"	beans	"	"	?	-----
"	"	"	"	"	maize	"	"	?	-----
"	"	"	"	"	okra	"	"	?	-----
"	"	"	"	"	cabbage	"	"	?	-----

45. Are seeds always available?

yes-----
no-----

46. Did you plan to grow other ones besides those you have?

47. If yes: What seeds, What kind of?-----

48. Why don't you breed your own seeds?

49. With your irrigation plot, do you think you are better off than the other farmers without a plot?

yes-----: go on: Why?-----

50. no-----: go on: Why?-----

51. Does irrigation farming make any troubles for you?

yes-----
no-----

52. If yes: What troubles? -----

53. If you could get more dryland fields, would you still like to keep the plot?

yes-----

no-----

54. What are the reasons? -----

55. Should women have the same chance as men to own a plot?

yes-----

no-----

56. What are the reasons, Why do you think so?-----

57. Do you think your irrigation scheme is important for your community (neighbourhood)?

yes-----

no-----

58. For what reasons? -----

QUESTIONNAIRE 2: SOCIO-ECONOMIC CENSUS 1988.

Village _____ Name _____ ID No. _____
 School _____ Church _____ Homestead _____

Names of people who live with you: _____

Mizimo _____

Granary _____

Kraal _____ House _____

Field 1: _____

Field 2: _____

Field 3: _____

Field 4: _____

Field 5: _____

Cattle: _____

Goats: ; ; ; _____

Chickens: _____

Other stock: _____

Oxen: _____

Plow: _____

Cultivators: _____

Soochchart: _____

Sledge: _____ Bicycle: _____ Radio: _____

Sewing machine: _____ Mill: _____ Lantern: _____

Fishhooks: _____ Fishnets: _____ Canoe: _____

Have you ever: _____

Go to work or live? _____

Given or received anything for marriage payments? _____

Had an unfair case against you? _____

This year or last year did you: _____

Have any cases? _____

Do any piecework for money? _____

Sell any stock? or fish? _____

Sell anything you made? _____

Get credit? _____

Work in a work party? _____

Hold a work party? _____

Make any town visits? _____

Make kupila? _____

Have mashate? _____

Mulongwe? _____

S I A T W I N D A I R R I G A T I O N S C H E M E

Gwembe District/Southern Province

Proposal for Rehabilitation by joint
GTZ (GIDDP) - Gossner Mission
Efforts

1. Introduction / Objectives
2. Project Layout / Rehabilitation Plan
3. Agricultural Production / Farm Income
4. Economic Feasibility
5. Marketing
6. Project Organisation and Management
7. Estimated Costs of Rehabilitation
8. Rehabilitation Schedule
9. Planning Overview - Logical Framework

August/September 1988

1. INTRODUCTION/OBJECTIVES

For 18 years Siatwinda Irrigation Scheme - located in Southern Province/Gwembe South - has been in existence and supported by the Gwembe South Development Project (GSDP). GSDP is carried out in the framework of an agreement between the Government of the Republic of Zambia (GRZ) and Gossner Mission (West Berlin).

The small-scale farmers of the scheme seem to have adopted to irrigation farming quite well in the meantime. But during recent years, despite a steady increase in crop yields per ha, the scheme has experienced a number of important problems, which are mostly related to the drawback of Lake Kariba, from where irrigation water is pumped to the farmers' fields. These problems were caused by a number of drought years and the consequent lack of water to be pumped. Various attempts and proposals have been tried in the meantime to overcome these shortcomings, but often failed due to insufficient planning and lack of funds. Nevertheless, a waiting list of 70 farmers, who applied for a plot within the scheme, is a clear indication that irrigated farming is profitable to them.

A comprehensive Feasibility Study to assess the economic viability of rehabilitating Siatwinda was carried out in 1986/87 by AHT (Agrar- und Hydrotechnik, Essen), on behalf of KfW, Frankfurt. Details about crops recommended for cultivation at Siatwinda, some socio-economic aspects, possible layouts of the scheme etc., are laid down in this study. But due to very high costs involved for the then recommended electricity supply - to drive electric pumps instead of diesel pumps - as well as the unreliable design regarding the envisaged extension area (high risk of flooding in quite a number of years), KfW proposed to the German Federal Ministry of Economic Cooperation (BMZ) not to finance the rehabilitation through a loan to GRZ. Instead, it was proposed to carry out the necessary rehabilitation in the framework of Technical Assistance as a grant to Zambia, namely through GTZ/GIDDP (Gwembe Integrated District Development Programme), but in close collaboration with GSDP.

After intensive discussions and field inspections with Gossner Mission, it was jointly agreed to carry out the rehabilitation according to the plan and layout described in this paper.

The overall objective of the rehabilitation is the same as that planned for GIDDP during the recent ZOPP-workshop, namely to "Improve the Living Conditions of People in Gwembe District". More details about outputs and activities for the rehabilitation are presented in the Project Planning Matrix (chapter 9).

The project purpose (objective in a narrower sense) is, "to make the scheme technically and economically sustainable and to enable the irrigation farmers to participate actively in the management of their scheme through a Farmers Executive Committee".

Responsibility for technical rehabilitation of the scheme will be with GIDDP/GTZ, but with assistance from Gossner Mission Advisor (GMA) to Siatwinda Irrigation Scheme, whereas the detailed job-descriptions will still have to be worked out. The devision of jobs will be as follows:

a) Procurement of all materials/items for import (pumps, vehicles

etc.) through GTZ headquarter, after joint specification between GTZ/GIDDP staff and GMA.

- b) Procurement of local materials required (sand, cement, pipelines etc.) by GIDDP, after joint agreement with GMA.
- c) Design of final layout (after additional surveying) by the Water Engineer (GMA), but checked by GIDDP/GTZ expatriates.
- d) The budget for the full technical rehabilitation will be with GIDDP/GTZ, under general GTZ accounting system.
- e) Monitoring of construction works and their timely fullfilment by GTZ-expert (to be employed within the GIDDP-Team), but with overall assistance by GMA.

GTZ will supply an experienced Irrigation Agronomist for 2 years (60 % of his working capacity for Siatwinda, 40 % for planning of additional small-scale irrigation schemes in the Gwembe District, but mainly Gwembe North, Lusitu Area). It is intended, that the GTZ-expatriate will for the first two years be stationed at Kan-chindu, near Siatwinda. A proposal for job-description is added as Annex II.

Running of the Siatwinda Irrigation Scheme is under full responsibility of GSDP, of which the GMA (three years contract) is a staff member:

- a) The scheme manager (also GSDP staff member) is responsible for the day-to-day management and is answerable to the Farmers Executive Committee (FEC), GSDP staff meetings and to the GMA.
- b) At present the budget for running the scheme results out of farmers' waterfees, GRZ and Gossner Mission contributions. The waterfees have to be steadily increased as described in this paper. GMA is responsible for the budget (income and expenditure).
- c) Support of agricultural marketing will be through GSDP, but with short-term assistance of GTZ/GIDDP (marketing study).
- d) Improvement of management skills of the FEC and the educational standard of all participating farmers through a special training programme, run by GSDP.
- e) Improvement of the organizational set-up (see organigramme in chapter 6), whereby the Siatwinda farmers will be motivated to form an adequate cooperative.

After completion of each phase of the rehabilitation, the scheme will always be handed over into responsibility of FEC, which will be running it. If any problem arises during the implementation of the rehabilitation, it has to be settled within a GSDP appointed committee. This committee, of which the GTZ-expatriate will be a member, has to be formed at the beginning of the rehabilitation.

2. PROJECT LAYOUT/REHABILITATION PLAN

It is intended to rehabilitate Siatwinda Irrigation scheme in 3 Phases (see also Table 7, Cost Estimations):

- Phase I covers 14 ha, which is the presently irrigated part of the whole scheme, lining of the reservoir (night storage), construction of three pumpstations and laying of the new pipeline.
- Phase II covers 18 ha and has formerly been irrigated before the drawback of Lake Kariba.
- Phase III will cover 25 ha, which had earlier already been allocated for extension of the scheme.

This will result in a total acreage of 57 ha. Following the present form of land allocation of 0.2 ha per farmer, about 285 farm families will benefit from the rehabilitation in the long run.

Contrary to the AHT proposal of pumping water directly to farmers fields, it is recommended here to make use of an existing, but presently damaged night store tank (reservoir) near to the scheme. According to experiences from other irrigation schemes, gravity irrigation - by making use of the water coming from the night store tank - is much simpler to handle by farmers. So the water from Lake Kariba will after complete rehabilitation be pumped into the then repaired reservoir by diesel pumps, and will from there feed the fields through a partly already existing channel system.

Three pump stations will be necessary to enable pumping throughout the year from different levels of the lake, whereas the pumps will be moved according to needs. It is proposed to build a new 12" pipeline of about 2.650 m in total, connecting all the 3 pump stations with the reservoir. The pipes of the old pipeline will be partly used later for the extension of the scheme, namely a citrus orchard on lighter soils, but within reach of the yet existing scheme.

The final location of the pump stations depends on a proper survey of the area between lake and scheme. To a large extent, the new pipeline will follow those lines proposed by AHT (see map in Annex I).

According to previous studies, the maximum water requirement will be 1.1 l/s/ha (continuous 24 hours duty) in the month of Dec. This means, the storage capacity of the reservoir (about 11 800 cubic meters) is sufficient to store at least enough water for two days of irrigation. As it is not advisable, that the pumping intensity of a diesel pump exceeds 10 hours/day, the pump capacity has to be 150 l/s. This will either require two pump units of 75 l/s or three pump units of 50 l/s each.

The lake level is fluctuating between the extreme maximum of 488.5 m and the extreme minimum of 475.8 m above sea level (see records in Annex III). Details for the installation of the pumps needed are given in Table 1. The proposed 3 pump locations will guarantee water supply between max. & min. lake level, as between two pump stations there is an overlapping of 0.5 m pumping range.

To keep the pumping costs low, a 12" asbestos cement pressure pipeline (class B) will be laid. All the material needed for this

pipeline can be bought in Zambia, except the pumps and some valves, which need to be imported. A 12 inch pipeline has been proposed for the following reasons:

- a) It leaves the possibility for later extension of the scheme due to its capacity.
- b) Friction losses are less than in smaller pipes, e.g. 9" pipes (details see in Table 2).
- c) Pumps of lower pumping capacity can be used, reducing investment and running costs.

From Table 1 + 2 it can be concluded that with two pumps running at the same time, the design manometric head for a pump with a capacity of 75 l/s should be 40 m; and for a pump with 50 l/s capacity it is 30 m. To extend the total operation period of the pumps and engines, slow running engines with about 1.800 RPM (rotations per minute) are recommended.

For the successful implementation of the rehabilitation of the scheme, it is very important that the same engineers completing the final layout, the specification of pumps and the material required for procurement are later also involved in the installation. This seems to be the only way to avoid confusion and later complains.

In addition, it is necessary to equip the Siatwinda workshop with required tools and a number of later needed spareparts for maintenance and repair of pumps. This has often been neglected in recent years and caused tremendous problems. The mechanic of the workshop, who's salary will in the long-run be borne by water fees the farmers ought to pay, has to be trained accordingly.

3. AGRICULTURAL PRODUCTION / FARM INCOME

The agricultural production and the crop rotations to be advised to the farmers are more or less the same they are already practicing since years, and where they have a good experience. Besides rice, most important is the cultivation of vegetables, of which they get highest income. In principle, each farmer can at least get two harvests per year from his plot. In recent years, onions were most profitable, followed by bananas, tomatoes, green maize, irish potatoes etc.. Nevertheless, after the rehabilitation there will be enough flexibility in selecting the crop cultivation according to market conditions and demand.

Throughout the last years, when sufficient irrigation water was available, farmers increased their yields of all the different crops. Table 3 shows the present income per ha for crops cultivated. This table has been obtained by adjusting the crop budget given in the AHT-Feasibility Study, Volume 2, Annex III, where the actual yield level had been underestimated. But also the crop prices, input costs and water fees had to be up-dated to the actual situation. From this table it can be concluded that with one rice crop and one vegetable crop per year, an income of about K 19.000 - 20.000 per year/ha can be obtained by the farmers. For bananas with 3 harvests in 2 years the income will even be higher

(K 30.000 per year/ha). With the present plot sizes (a farmer cultivates 0.2 ha) the farm income from irrigation alone is about K 3.800 - K 4.000 per year. But most of the Siatwinda farmers cultivate besides irrigated land some dry-land fields and own in addition cattle or goats, resulting in a much higher total annual farm income.

In the near future, when after full rehabilitation adequate water supply, improved management and intensified agricultural extension will be available, the yields of the different crops are expected to increase. The respective figures for year 5 after rehabilitation are presented in Table 4. Again the crop budgets of AHT are taken as a basis. In this case, AHT overestimated the future yields, which have been reduced accordingly. Table 4 indicates that an income of K 35.000 per year/ha can be achieved from two crops (rice & vegetables). The farm income per 0.2 ha plot then can reach K 7.000 per year - from irrigation alone - and for bananas it will even be higher. This explains why farmers are presently very keen to join the scheme and they are even thinking of starting a banana orchard.

TABLE 1: Installation of pumps

Pump Station	Pump Inlet(m)	Lake level(m) (max) - (min)	Reservoir level (m) (min) - (max)	Statical head (m)	Suction hight (m)	Length of pipeline to reservoir (m)
High	489.0	488.5-484.5	492.0-494.5	3.5-10	0.5-4.5	1000
Medium	485.0	484.5-480.5	492.0-494.5	7.5-14	0.5-4.5	1850
Low	481.0	480.5-475.8	492.0-494.5	11.5-18.7	0.5-5.2	2650

TABLE 2: Friction losses 12" asbestos-cement pipes class B

Flow (l/s)	Friction losses (m/100m pipe)	Friction losses from pump stations high location	medium location	low location (m)
50	0.13	1.30	2.41	3.45
75	0.27	2.70	5.00	7.16
100	0.45	4.50	8.33	11.93
150	0.92	9.20	17.02	24.38

TABLE 3: Crop budget for the different crops year 1

Crop	yield kg / ha	price ¹⁾ K / kg	input ¹⁾ material costs K/ha	gross margin ²⁾ K / ha	labour- days / ha
Rice	4.000	2.10	989	7.411	174
Tomatoes	10.000	1.20	361	11.639	249
Onions	6.000	1.70	3.729	6.471	224
Potatoes	7.800	2.75	12.034	9.416	171
Cabbage	7.600	1.00	500	7.100	141
Okra	6.500	2.00	409	12.591	135
Carrots	7.800	1.70	2.500	10.760	258
Bananas	25.000	1.00	5.000	20.000	?

TABLE 4: Crop budget for the different crops year 5

Crop	yield kg / ha	price ¹⁾ K / ha	input ¹⁾ material costs K/ha	gross margin ²⁾ K / ha	labour- days/ha
Rice	6.500	2.10	1.527	12.123	182
Tomatoes	15.000	1.20	1.065	16.935	270
Onions	10.000	1.70	4.826	12.174	314
Potatoes	16.000	2.75	17.019	26.981	195
Cabbage	20.000	1.00	950	19.050	172
Okra	10.000	2.00	976	19.024	155
Carrots	15.000	1.70	4.753	20.747	273
Bananas	35.000	1.00	5.000	30.000	?

1) Prices of 1988 considered

2) Equal to farm income, as only family labour has to be considered, but the water fees as fixed costs to be covered

4. ECONOMIC FEASIBILITY

To prove whether Siatwinda Irrigation Scheme is economically feasible in the long-run and whether it can be self-sustainable, an estimation of Gross Margins/Farm Income against overall cost development has been carried out for a period of 20 years, but based on the present price/cost relationship (Table 5). So only crop yield increases per farm plot are considered, not the annual increases in costs and farm produce prices, which are assumed to develop at the same ratio/percentage. The model calculation in Table 5 also has to show, if the water fees to be charged from the farmers can cover the running and maintenance costs as well as depreciation on important items. The water fees will steadily be increased from about 12 % of the gross margin per farm plot (0.2 ha) up to 20 % in the 5th year (line IV).

According to the development assumed in this calculation the average farm income (lines III & V) per year is not only sufficient to give a good return to farmers for their work, but enables, moreover, the project to cover its overhead costs (maintenance & running costs). If the water fees are collected the way proposed here, already in year 3 some funds can be generated for later additional investments (e.g. replacement of pumps etc.). Considering the depreciation for pumps and the marketing lorry (line IX) returns on water fees will give in year 6 and onwards a surplus of nearly K 40.000.

So it can generally be concluded, that Siatwinda Irrigation Scheme - after full rehabilitation - can at least cover its overhead costs as per Table 6 (including salaries of basic staff members). The scheme can also generate sufficient funds for necessary replacement of items required (pumps, lorry, spareparts, etc.). As it is proposed to support the rehabilitation with a grant to GRZ, meaning that expatriates' expenses as well as procurement costs for materials and the basic constructions required will be borne without charging the scheme, a longterm economic feasibility is given ! A sustainable project success can, consequently, be assumed.

5. MARKETING OF CROPS

Based on the experiences of GSDP, the marketing of all crops to be produced at Siatwinda should be without major problems, as the demand on the plateau (Choma, Monze, Line of Rail generally) is still increasing. In addition, there is an important local market of Gwembe South at Maamba Coal Mine. In case Siatwinda farmers form a primary cooperative society and become member of "Chikuni Fruit & Vegetables Cooperative", most of their crops will directly be taken at reasonable prices.

Nevertheless, Siatwinda farmers had problems in marketing their produce in recent years due to various circumstances. So in order to avoid overflooding of the vegetable market at certain periods of the year, a good crop rotation and cultivation calendar must be developed during the first three years.

TABLE 5: ESTIMATED DEVELOPMENT OF GROSS INCOME OF SIATWINDA IRRIGATION SCHEME (AT 1988 PRICE / COST RELATIONS, FOR 20 YEARS)

Item	1 (1989)	2 (1990)	3 (1991)	4 (1992)	5 (1993)	6 - 20 (1994-2008)
I Average Gross Margin per 0.2 ha farm	4.000	4.000	4.800	5.600	6.400	7.000
II Number of farmers in the Rehabilitation Scheme	70 (14 ha)	70 (14 ha)	160 (32 ha)	285 (57 ha)	285 (57 ha)	285 (57 ha)
III Total Gross Margin from whole Irrigation Scheme (I x II)	280.000	280.000	768.000	1.596.000	1.824.000	1.995.000
IV Water Fees to be paid (20% of annual Gross Margin per farm from year 5 onwards) ¹⁾	33.600 (12%)	39.200 (14%)	122.880 (16%)	287.280 (18%)	364.800 (20%)	339.000 (20%)
V Income of whole Irrigation Scheme (less water fees) (III-IV)	246.400	240.800	645.120	1.308.720	1.459.200	1.596.000
VI Yearly Running Costs (as per Table 6) ²⁾	50.000	50.000	70.000	130.000	130.000	130.000
VII Yearly Maintenance Costs of Scheme (Table 6)	20.000	20.000	30.000	50.000	50.000	50.000
VIII Project income from water fees against costs (IV-VI-VII) (without depreciation)	-36.400	-30.800	+22.880	+107.280	+184.800	+219.000
IX Depreciation on 2 pumps and vehicle for marketing (5years) ³⁾	180.000	180.000	180.000	180.000	180.000	180.000
X Project income with depreciation on part investment considered IV-(VI+VII+IX)	-216.400	-210.800	-157.200	-72.720	+4.800	+39.000

REMARKS TO TABLE 5: 1) It is assumed that the water fees to be charged from irrigation scheme farmers will steadily be increased from 12% of their calculated gross margin to 20%.

2) At present running costs without labour are about 1.600 K/ha on a similar scheme near to Siatwinda, namely Buleya Malima.

3) Only two pumps and one lorry for marketing is considered.

TABLE 6 : Yearly project costs at full development (57 ha)

Running costs

- fuel	58.000
- oil, grease	4.000
- spareparts	20.000
- three staff members	16.800
- allowances	3.000
- workshops material	5.000
- transport	10.000
- miscellaneous 10%	<u>13.200</u>
	130.000

Maintenance irrigation scheme.

- building material	25.000
- erosion control	10.000
- labour costs	10.000
- miscellaneous 10%	<u>5.000</u>
	50.000
	<u>180.000</u>

Depreciation:

- 2 pumps (5 years)	80.000
- 5 ton truck (5 years)	100.000
	<u>180.000</u>

TOTAL = 360.000

To further improve marketing, funds for a marketing study have been included in the rehabilitation budget/cost estimation (see Table 7). This study should not only include Siatwinda, but also Buleya Malima and Nkandabwe Irrigation Schemes, because all the schemes should aim at an integrated strategy.

To ease the marketing generally, a lorry of about 3 - 5 tons will have to be supplied, and a farmers cooperative to be formed. Some additional store and marketing equipment (crates, bags tec.) will also be needed, but should mainly be purchased from the marketing profits. Although at present some private traders are coming to Siatwinda to collect agric. produce, it cannot be expected that the full production of 57 ha can be sold without respective supporting facilities. No difficulties in marketing exists presently for paddy rice and citrus, but the latter can only be cultivated on lighter soils at Siatwinda. A decision on future citrus growing will, hence, be taken at a laterstage - despite the steadily increasing demand of the Zambian fruit juice industries.

To advice the farmers cooperative and to take care of all marketing aspects, an experienced marketing officer will have to be employed. His salary has to be borne by the farmers as indicated in Table 6. This officer should not only advice the farmers coop. he should at the same time have to observe the overall market development and select new and appropriate market channels for all agric. produce of the scheme. This will definitely need some training and experience, what will have to be gained through the first years, while the rehabilitation is in progress under the expatriates' supervision.

Further details of produce marketing and a respective strategy has to be part of the mentioned marketing study.

6. PROJECT ORGANIZATION AND MANAGEMENT

The farmers of the present irrigation scheme are being represented by the Farmers Executive Committee (FEC). This committee has 9 members: Chairman, secretary, treasurer, vice-chairman, vice-secretary, vice-treasurer and three trustee members. All members are working on voluntary basis and are elected by a general farmers meeting.

In future their main task will also be the overall management of the scheme, but with respective advice from the expatriates:

- * deciding on principle policies of the scheme;
- * considering new applicants;
- * expelling farmers not performing sufficiently;
- * collecting water fees and controlling the budget;
- * organizing special farmers activities; and
- * employment and supervision of staff.

To give the Siatwinda farmers a legal framework, the farmers should be assisted in forming a Primary Cooperative Society with the main purpose "agricultural production under irrigation". The FEC will be the board of the cooperative. To improve further organizational aspects, the FEC and the farmers themself will receive training by the GSDP training programme. The GSDP-officer

for the training programme is also responsible for the training of farmers and FEC in Buleya Malima and Nkandabwe Irrigation Schemes.

For the day-to-day management of the irrigation scheme staff has been employed. The proposed internal organization and management set-up for Siatwinda, without the expatriate advisers, is presented in Figure 1.

The scheme manager, who will be posted to the scheme by the MAWD through GSDP, will be in charge of the day-to-day management. A house will have to be built for him near the scheme. In his tasks he receives support by other staff members on four subjects:

Agricultural Extension : to advise the farmers on cultivation practices and to keep agric. records. This work has to be done in close cooperation with the Mochipapa Research Station, of which a substation is at Siatwinda Irrigation Scheme. For the direct agricultural extension work an **Agricultural Assistant (AA)** will be seconded by MAWD.

Marketing: see chapter 5 ! The marketing officer will also have to supervise the lorry driver. Both their salaries shall be borne by waterfees collected.

Watermanagement: is needed to guarantee an adequate and regular watersupply to all the farmers. This has to include organization and maintenance of the whole irrigation scheme. Because a qualified person will be needed for this job in the longrun, a graduate of NRDC (National Rural Development College), qualified in watermanagement, will be required and trained on the job. In order to avoid over-staffing of the scheme, this person should at the same time act as scheme manager.

Two pump-attendants will also have to be seconded by MAWD through GSDP, mainly to take care of the running of all pumps.

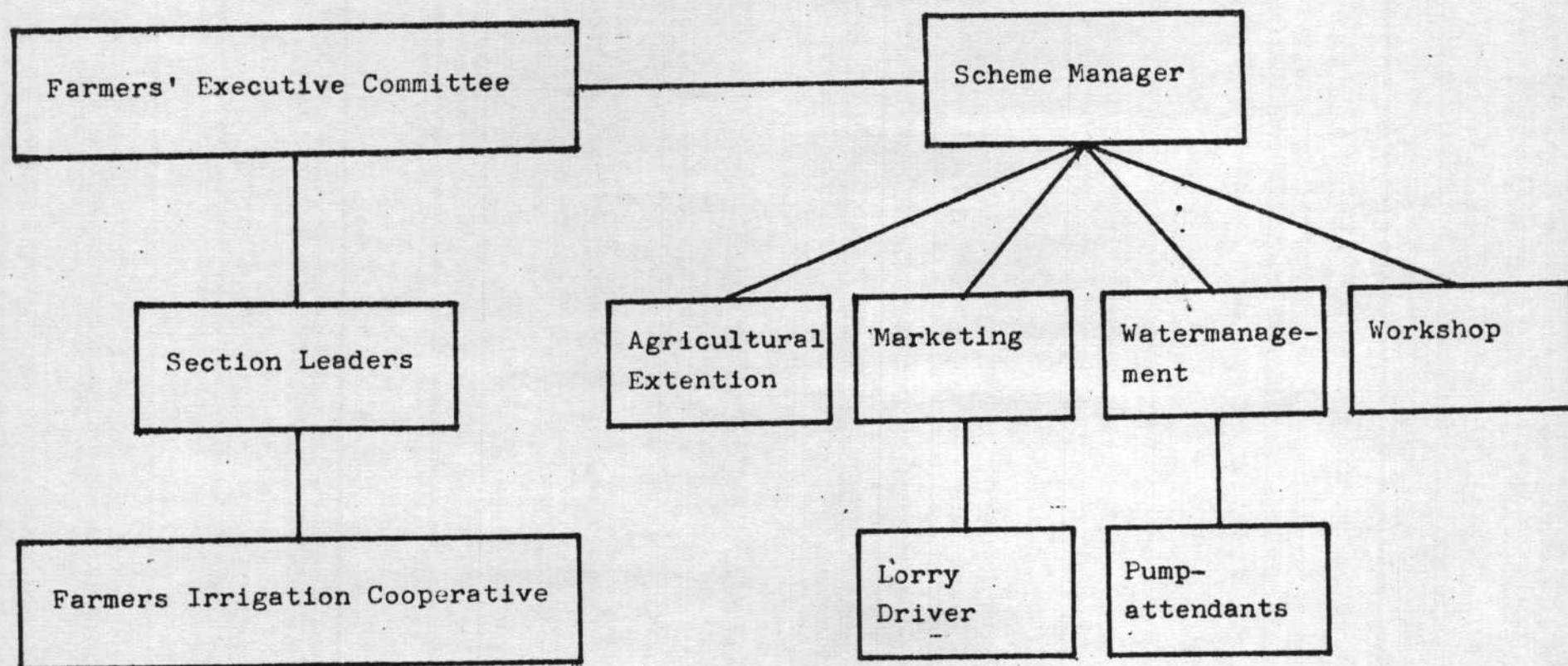
The workshop is required to do maintenance and repairs on pumps and the lorry, as well as for basic farm tools preparation. But the workshop should not only serve the scheme, it should at the same time function as a rural workshop, carrying out basic repairs against payment at cost-prices.

The **mechanic** of the workshop should be well-trained and get his salary through the waterfees collected.

The scheme manager has to supervise all the staff members and has to streamline all activities within the different fields. After handing over of the scheme in full Zambian responsibility, he will then be in charge of the budget in close collaboration with the treasurer of the FEC. During the first years, the scheme manager receives advice from GMA, who also has to organize/arrange respective training courses for all staff members.

Within the irrigation scheme the farmers along each channel elect a section/channel leader as contact person of those farmers towards the FEC and the scheme management.

FIGURE I: ORGANIZATION AND MANAGEMENT SET-UP



7. ESTIMATED COSTS OF REHABILITATION

Table 7 summarizes the main cost components to be considered for the three phases recommended for the rehabilitation of Siatwinda. The costs are expressed in DM, although most of the data of primary calculations are based on Zambian Kwacha. The official exchange rate (1 : 4.6) was then used for the DM expression.

As can be seen, most of the direct works at the site will be done during the first phase, such as pump location survey and building, repair of reservoir and channels, pipeline laying etc. All the pipes required can be purchased in Zambia (TAP, Chilanga). A respective quotation has already been received, whereas payment in foreign exchange will reduce costs tremendously.

Land clearing and levelling for the new extension area of about 25 ha is assumed to be done by the later benefitting farmers on self-help basis. Nevertheless, some funds have been earmarked in case heavy machinery might be required.

The total costs for the scheme rehabilitation (excluding expatriate personnel, their housing facilities and equipment as well as the support to marketing) are estimated to be about DM 520.000,-.

The crop marketing, as discussed above, requires special attention. A total amount of DM 160.000,- has been included in the budget for the various activities of the rehabilitation period. All the other figures in the cost estimation (especially for GTZ-personnel and equipment to be imported) are based on experiences of similar projects carried out in Zambia.

8. REHABILITATION SCHEDULE

A proposal for the various activities of the rehabilitation and their timely planning is summarized in Figure 2. The same activities are repeated in the Planning Overview - Logical Framework, which is required as a GTZ-internal document.

TABLE 7:

COST ESTIMATION FOR REHABILITATION AND EXTENSION OF SIATWINDA IRRIGATION SCHEME (DM)

	Phase I	14 ha	Phase II	18 ha	Phase III	25 ha (-57ha)
Pumps + engine	2	75.000	-	-	-	-
Pump location building	3	18.900	-	-	-	-
Pipe line (labour included)	2650m/12"	164.300	-	-	-	-
None-return valve	4	6.000	-	-	-	-
Lining up reservoir (11800m ³)	1	55.000	-	-	-	-
Repair main channel	800m	1.600	-	-	300m	600
New main channel	-	-	150m	1.575	400m	4.200
Lining sec. channel	1000m	10.500	1300m	13.650	2500m	26.250
Main drainage	600m	1.200	600m	1.200	1000m	2.000
Sec. drainage	1700m	2.550	1300m	1.950	3500m	5.250
Land clearing	-	-	18ha	4.000	25ha	8.000
Land leveling	-	-	-	-	25ha	15.000
Dijke repair (labour/material)	-	-	-	-	1800m	5.400
Fencing	-	-	-	-	2500m	15.000
Division boxes (labour/material)	5	1.050	2	420	5	1.050
Contingencies	15%	59.400	15%	4.205	15%	14.750
		395.500		27.000		97.500
Total irrigation scheme rehabilitation			DM 520.000			
<u>MARKETING:</u>						
Project lorry		DM 75.000,- (5 tons)				
Marketing study (2.5 months)		DM 50.000,-				
Storage building + office		DM 35.000,-				
						160.000
<u>PERSONNEL/ADD EQUIPMENT:</u>						
Water-engineer (GMA)		DM -,- (Gossner Mission Funds)				
GTZ - Expatriate (2 years)		DM 360.000,- (60% Siatwinda, 40% Lusitu Schemes)				
Generator		DM 20.000,-				
Vehicle		DM 40.000,-				
House rehabilitation/building		DM 120.000,-				
Land Surveying Equipment		DM 25.000,-				
Total Costs (for BMZ)		DM 1.245.000,-				

Fig.2: REHABILITATION SCHEDULE

Activities/Jobs to be done	1988										1989					
	aug	sep	oct	nov	dec	jan	feb	mar	apr	may	jun	Jul	aug	sep	oct	
Establish Cropping Calender			<u>vegetables</u>				<u>rice</u>						<u>vegetables</u>			
Climatic Conditions/Recording						<u>rain</u>										
Carry out Land Survey																
Preparation of Layout/Maps	a)	b)				c)			d)	e)						
Procurement of Material																
Supervision/Monitoring of Construction																
Pipeline Construction																*
Construction of Pump-locations																*
Repair/Lining of Reservoir																
Rebuilding of Main Channel & Distribution Boxes																
Lining of Distrbutary Channels																
Landclearing																
Levelling																
Fence and Dike Construction																
Construction of Marketing Building																

- a) landsurvey equipment
- b) 5 ton truck
- c) pipes, valves and cement
- d) pumps
- e) sand
- f) roofsheets, wood and cement

*) depends on actual lake level, otherwise has to be shifted to the next year

The Training Programs.

1.

Following a research ^{in 1987} on the effectiveness of Farmers Executive Committees at the three irrigation schemes, a volunteer, Ms. G. Herlitz concluded that the F.E.C.s at all three schemes were incapable of ~~managing~~ ~~the scheme~~ management functions. She recommended a training program to improve their motivation for self-reliance and their management skills, emphasizing a "participatory approach" (Herlitz 1987:91). A participatory approach, she wrote, "means that technical innovations and changes in the social system like a management set up which was not known before is done with the people the improvements are meant for, in order to make them understand and learn with the development of the scheme" (ibid).

Along these lines ~~she~~ she developed in 1987 a two-tiered training program, at the behest of Gossner Mission, to improve the management competence of the

farmers executive committees, and 2. the educational level of scheme farmers in general, emphasizing "literacy", money-handling and weight/volume/price computations. These programs were

~~not~~ implemented after September 1987, ~~the~~ supervised by Ms. Hertitz, by that time working under contract to Gossner Mission as a Gossner Service Team member and staff member of G.S.D.P.

Except in the case of the Farmers Executive Committee at Nkandabbwe Scheme, ~~the training program~~ ~~which gained~~ ^{app} ~~and self-~~ ^{improved its} in ~~the~~ community esteem, and ~~the~~ practical ^{management} ~~of the~~ skills, the training program overall failed in its aims.

The Literacy Program

At all the schemes the literacy programs, taught by hired teachers are said to have been quickly abandoned by students who found them "a waste of time" according to one of the teachers employed in the programs. ~~By the time of my arrival in~~

By the second week of August, ~~the~~ when ~~Ms.~~ Ms. Hertitz left, ~~the~~ the only literacy classes still held, were ~~taught~~ haphazardly at the Nkandabbwe Scheme

where Ms. Herlitz focused the bulk of her attention. Classes at the other schemes had already been abandoned for lack of pupils. Even ~~at~~ ^{the week} NKandabbwe, ~~the~~ classes ceased ^{when} ~~when~~ of Ms. Herlitz ~~left~~ ^{departed}. ~~Even~~ ~~then~~, It is said that the ~~only~~ ~~pupils~~ ~~the~~ classes were rejected by younger people as irrelevant, even at NKandabbwe, and that they were taught inappropriately to convey learning and respect to the few elder people who attended.

At Siatwinda and Bolega-Malimba ~~the program~~ ~~classes~~ were largely abandoned by students after the first few months. Those who attended initially claimed that the ~~classes~~ curriculum, designed to ^{accommodate} ~~for~~ a very wide range of educational backgrounds, was far too remedial. ~~for~~ ~~the~~. Attendance invited scorn from friends, jokes, and a loss of esteem: "if you ^{can} learn in this program you must be really stupid" - was a joke amongst the younger adults at Siatwinda. And so the classes were abandoned.

Quite sensibly, the teacher ~~subsequently~~ taught only by seeing that those who came to sell produce, weighed and calculated the sale themselves. She ~~attempted~~ only to correct them if they did not succeed.

The classes at all the schemes are defunct and had no visible positive impact. Apart from employment of the teachers, and drawing attention to ~~the~~ explicit, to ~~the~~ science ~~for~~ the nation ~~not~~ - the connection between education and income, even in farming, the literacy program has had little effect in bettering ~~the~~ ~~poor~~ ~~farm~~ ~~capable~~ ~~stills~~. conditions in the ~~the~~ already very much advanced scheme communities. The classes were seen by most a spoke with as irrelevant and unnecessary. In relation to other needs in Gwembe Soit2 they probably are.

The Farmers Executive Committee Training Program

The F.E.C. Training program implemented at the three schemes had positive impacts only at Nkandabbwe. ~~It is~~

Conditions at Nkandabbwe, manageable ~~and~~ ~~by~~ in ~~the~~ social and technical respects by community involvement, are also compatible with currently popular development ideologies, and ^{these} coincide with Gossner Mission's development beliefs, — Self-help is ^{as a} development approach compatible with the limited ~~resources~~ resources at ~~its~~ disposal.

Gossner Mission's disposal. Therefore the ^{Vision} of a ~~training~~ training program that ~~will~~ promised to make ~~self~~ ~~the~~ the long-dependent pump schemes self-reliant, was very attractive. Unfortunately ~~it~~ this ~~fails~~ ~~fails to be its own complement~~

~~fails~~ vision, workable at a low-cost gravity flow scheme such as Nkandabbwe fails to comprehend the fundamental differences in needs, required for scheme viability at the pump schemes.

The training program at Nkandabbwe supported and reinforced an ongoing process of self-management at Nkandabbwe. But the same lessons and expectations impressed upon the Farmers executive

committees at the pump schemes threatened & throw the ~~other~~^{both} operations into disorganization. This is what happened at Statwinda, where no technical advisor was present to buffer the scheme from the immediate effects of the program.

At Bulega-Malma, the technical advisor, Mr. Hosravi, played such a role, attenuating the impacts of the demand for self-reliance, knowing full-well this would lead to a breakdown of the scheme. His blocking of the F.E.C.'s ability to ~~put the program~~ act on the training program was a major ground for ~~the~~ the long conflict between he and Ms. Herlitz, who insisted he was "inhibiting development". In fact he knew that implementation of ~~the~~ F.E.C. management ~~as~~ ~~attempts~~ as Ms. Herlitz saw it, was wholly incompatible with operational ~~demands~~ ~~as~~ ~~such~~ of the scheme. His position prevented a breakdown ~~as~~ but ~~in~~ only by thwarting the F.E.C. Training program. His rejection of the ~~demands~~ ~~of the~~ program placed F.E.C. officers in a very difficult

position in which, on the one hand they were exhorted to manage the scheme by ~~the~~ Ms. Herlitz, and on the other hand, they were deprived of any avenue for ~~the~~ doing so by MR. Hossain.

~~This ^{was} an exceedingly confusing situation for them, in which they had to see the F.E.C.~~

Their response was to regard the training program, under a veneer of seriousness, as an irrelevant game. This contributed to a lack ~~of progress~~ of commitment to the training, to a lack of progress, ~~which~~ ^{and} which they hid from the serious Ms. Herlitz under a mask of confusion, as a means of excusing their failure "to develop." ~~the~~ Ms. Herlitz interpreted this failure to progress, and to struggle to act as the Nkandabbwe F.E.C. officers as, in part, owing to a lack of sophistication. On the contrary, ~~officers~~ ^{they are certainly sophisticated enough to} of the F.E.C. at Buleyan-Malim are ^{quite} sophisticated; ~~and they~~ ^{they} recognized ~~that~~ the infrastructure at Buleyan-Malim.

is ~~not~~ beyond their existing competence to manage, and that they stand to gain a great deal from accepting MR. Hossain's plans, ~~and~~ ~~the~~ organization, and management.

The ~~farmers~~ officers at Siatwinda had, at the time no such option. Their scheme advisor had left in December 1987 and Mr. Herlitz was assigned to assist them in his place ~~and~~ during much of 1988. He gave full rein to the F.E.C. to organize and manage the scheme. The consequences of this have been discussed in the section considering Siatwinda's breakdown. Not recognizing the source of troubles at Siatwinda as deriving from the implementation of her theory, she instead ~~blamed~~ ^{attributed} ~~the~~ ^{problems} ~~late~~ ~~plant~~ ~~date~~ that began to emerge in the scheme to ~~the~~ decisions taken by her "predecessor" Dr. Witten. The late planting, for example, was blamed on Dr. Witten's decision to grow "rainy" season rice crop. Farmers insist this was not the case, ~~but~~ ~~the~~ ~~the~~

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Water was not monopolized by the rice crop, they argue. They attribute the lateness instead & haphazard management of conditions by the F.E.C. who had stripped ~~of~~ the agricultural aspect out of management responsibilities.

The F.E.C. training program could have been "a disaster" at Buleya-Malena. At Siatwindu it was.

Conclusions

This report has presented very little encouraging information regarding current conditions in Gwembe South, or on interventions undertaken to better them. Further, this report comes at a time when G.S.D.P. faces serious internal contradictions and difficulties.

Existing programs I have examined were formulated long ago. They neither recognize nor serve current development needs. Change would be very difficult given Gossner Mission's and G.S.D.P.'s existing commitments. Many decisions on which this report bears had already been taken, or were in the process of implementation at the time I began the research. It is doubtful therefore that this report can have much impact on the nature of development intervention in Gwembe South.

If I were to make recommendations, I would suggest that as much as possible, emphasis be shifted to wide ranging extension programs to promote simple techniques

villagers can use to ameliorate the harshness of their conditions. ~~transport~~
A reliable transport ~~assistance~~ program spanning Gwenbe South on a weekly basis would go far ~~to~~ in the short-term, to ~~the~~ alleviate many of the immediate problems confronting Gwenbe South residents.

For ~~the~~ ⁽¹⁹⁸¹⁾ ~~specific~~ The reports of Buntzel and Scudder, Colson and Scudder (1982) ~~to~~ should be closely examined in view of the information I have presented here. They ^{appear} to be as valid today as when they were written, with the exception of ~~the~~ Buntzel's extensive recommendations on the organization of G.S.D.P. proper.

The people of Gwenbe South are in great need of assistance if they are to forge livable conditions for themselves ~~in~~ ⁱⁿ coming years now and in coming years. It is to be hoped that Bossner mission and G.S.D.P. will continue to work ~~to~~ and to find appropriate ⁱⁿ the structure.

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ADDENDUM A

Reverend Luigi has subsequently
asked ^(at the conclusion of the research) that a ~~taskforce~~ develop
recommendations to be included in
an ~~appendix~~ ^{Annex}. Unfortunately, ~~this~~ the
lateness of this request makes
it impossible for me to do so.
~~This~~ This would require ~~several~~
~~weeks~~ of additional research targeted
to ascertain the constraints and
possibilities ~~necessary~~ to consider
~~determining other~~
that will ~~afford~~ ^{determine} alternatives.
It is regrettable that the report could not
have been initially so oriented.

J. H.

Lusaka 19 October 1988

Herr Melville

Report of Jonathan Kabarak 10/1988

Introduction

In January 1988 I was asked by former Gossner Mission Liaison Officer Sitska Krissifoe if I would undertake a study of GSDP's programmes operating in Sinazongwe and Mwemba Chieftaincies. This was to follow a year of social anthropological research in Gwembe, spanning the valley from north to south. I tentatively agreed to do so and in early June 1988 met with Gossner Mission Director and acting Chairperson for the Zambia Desk Rev. Dieter Hecker. He instructed me to focus the research on the organization, operation and impacts of three irrigation schemes assisted by Gossner Mission, with special emphasis on the "acceptability" of the distinctive management approaches in each of the three schemes. I was also asked to examine the impacts of a training program for the irrigation schemes, developed and implemented during the previous year. It was agreed that a Terms of Reference Document would be drawn up by Gossner Mission to guide the research, but this never materialized. There was latitude therefore, for the Planning and Evaluation Officer GSDP, and GST Chairman Rev. Ulrich Luig, to ask once the work had begun, that I further look at the functioning and role of a chain of depots established throughout Gwembe South under the Valley Self-help Promotion Society (VSP). I was asked to determine the potential of VSP Depots for future use as channels for development activities and supplies to the more remote areas of the sub-district.

e/ I readily agreed to this arrangement though it meant cutting short time originally allocated for research at the two pump irrigation schemes, Buleya-Malima and Siatwiinda. Nevertheless, time was sufficient to allow for collection of data needed to form the conclusions I present in the following pages.

I spent altogether two months in the collection of data. Three weeks were spent initially at Nkandabbwe Irrigation Scheme, residing in Siamajele Village, to have closer access to the community life and events. During September I spent one week in each of the two pump schemes, Buleya-Malima and Siatwiinda, respectively. The final week of research was spent travelling between extant VSP Depots, from Chiabi, at the northern end

of the Sinazongwe sub-district, to Kafwambila and Siampondo at the southern end, interviewing villagers and VSP agents.

I have understood the intent of the irrigation scheme research in the following light : Gossner Mission and GSDP are interested in understanding the strengths, weaknesses and potentialities of the irrigation schemes they presently support or assist. Presumably this will aid them in determining how far along the schemes are on the path to self-reliance, a point at which Gossner Mission can "hand-over" the schemes, and hopefully move on to other development activities and emphases. For myriad reasons, the schemes, except the gravity-flow scheme at Nkandabbwe, have not yet reached such a point in the course of their histories of nearly two decades. Both pump schemes have undergone apst rehabilitations, and both are in the process of rehabilitation now. Buleya-Malima is mid-way through a rehabilitation that started in 1985-86, involving electrification, funded by the government of Japan. The Siatwiinda infrastructure is badly deteriorated despite a recent rehabilitation. Gossner Mission and GTZ (Gessellschaft fuer Teknische Zusammenarbeit) who have agreed to a collaboration in "the rescue of Siatwiinda", are now awaiting a decision by BMZ of the West German government on the allocation of funds for a further rehabilitation. Rehabilitation plans for both schemes involve extension of the areas cultivated, to accommodate roughly three times the number of plotholders. Certainly such plans have implications for the achievement of self-reliance and the possibility of "handing-over". These will be discussed. It must be kept in mind however, that the research was focussed by direction, on understanding current conditions and was in no way designed or conducted as a feasibility stydy. Nor can it be construed to be such. I have made some observations where I felt that these could be helpful, though it was emphasized to me by Rev. Luig that Gossner Mission and GSDP are not interested in recommendations, on this, or on other aspects of GSDP's future plans.

A second intent of the research on the irrigation schemes, as I have understood it, is to understand the relative "acceptability" of the distinctive management approaches existing between Buleya-Malima, with an outside management in which the farming community is little involved, and the gravity-flow scheme at Nkandabbwe, which is managed entirely by members of the irrigation community.

A third intent of the irrigation scheme research was to attempt to understand the "transitional" condition of Siatwiinda Pilot Irrigation Schemes to determine why, although water, soils and inputs have been available, farmers of the scheme have this year produced and sold little in their fields, on average, less produce than what is required to pay half their diesel cost of pumping, per plot; why farmers virtually ignore the F.E.C., (Farmers Executive Committee), training programmes and seminars, why the Agricultural Assistant is essentially powerless and inert, and why the scheme lies in shambles as a large-scale rehabilitation and extension programme is being mounted. This will be discussed in the section on Siatwiinda Pilot Irrigation Scheme.

A fourth intended outcome of the research has been to understand the performance and impacts of a recent training program for the irrigation schemes on farmer literacy and on Farmer Executive Committee management capabilities. This is closely linked to the schemes but is considered in a separate sector. Performance of the Farmer Literacy Training Program was problematic since it was not operative during the time of my stay. Though teachers generally showed up, students did not, and as a result, no classes were held. For assessment of the literacy training program therefore, I have had to rely on interviews with teachers, participants, and non-participating observers of the program during the time it was extant. Unfortunately at the time of this writing I do not have access to the Final Report of the Training Officer or other documents that would be useful in the assessment, since the GST Chairman is absent on leave and most of these are filed in his care.

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initially

I have described the intent of the research on VSP depots above and discuss my findings on the depots in a separate section toward the end of the report.

I had read the GSDP evaluation by Scudder, Colson and Scudder, (1982) some years ago. Their report has been reviewed again the course of this research. In addition, at the time of writing up my results, I have gained access to a copy of the 1981 evaluation of GSDP written by Rudi Buntzol. Though I would come to quite different conclusions about the Organization of GSDP, I have been interested to read his observations on the unsuitability of pump irrigation (1981:6, 17-18) as a means of fostering widespread improvement of living conditions in Gwembe South. Seven years later and over the course of two months of research I have been compelled by facts confronting me to draw similar conclusions about the inappropriateness of pump schemes as means of promoting betterment for the many. Scudder, et al. (1982) also recognized that the schemes could serve only a limited portion of the population and suggested means to avoid this by diversifying extension activities to small-scale irrigation, watershed improvement and programs targeted at rainfed agriculture.

However, it has been emphasized that the purpose of this assessment is to provide information and not to make suggestions or recommendations. Clearly GSDP's hands are full coping with existing programmes. There is always great scope for development assistance, and no matter what one has achieved, suggestions -- at times even passionate suggestions -- can and will be made as to how one's achievements can and ought to be improved. I have attempted to abstain from this as much as possible.

This report will certainly draw criticism by those who will feel I present an unfair view of their programmes. The assessments presented in this report consider information from written sources and other documentation, censuses, interviews with GSDP staff and officers in various programmes. But above all I have relied on statements and data collected from the people served by the various programmes.

In doing so, I have taken the advice of an officer of VSP, and member of its Executive Committee Vickson Siankondo, who advised me that any report of value must represent the views of those being served rather than relying on the views of those who run the programme. I have sought to do both, and by this means to produce a synthesis that best illuminates the situations I have observed. As a result it is almost certain that each interested reader will find major points of disagreement. It is not necessary that readers agree with my assessments in order for the report to be useful. Indeed, if those who disagree are able to marshall evidence to disprove a point or position I have taken, this will aid us all to more accurately understand the situation. My assessments are limited to the evidence I was able to collect. Based on this I have striven foremost to give a frank and clear assessment of the current conditions without concern for the politics of "truth."

Evidence indicates that conditions in Gwembe South, under a veneer of modest development, are grave. Tonga are increasingly forced to scramble, and to innovate. They can no longer afford to attempt to conduct "business as usual." Nor can it be a time of "business as usual" for any who wishes to help them.

I have begun this report by describing some important aspects of the current social, economic and ecological conditions in which the programmes of GSDP now operate. I hope that these data too, will be of interest and use.

Sincerely,

Jonathan Habarad
October 8th, 1988
Sinazeze.

CONTEXTS OF DEVELOPMENT IN GWEMBE SOUTH, 1988

The face of Gwembe is changing. To any observer it is clear that today Tonga of the Valley are well established as participants in Zambia's policy and economy. Government provides services through District Council, Ministry of Agriculture and Water Development, and through parastatals such as Lintco and SPCMU. Local Organization is changing rapidly as Party Officials begin to take on administrative roles in village affairs, Christian Churches have proliferated in the past half-decade, so that as many as twenty-five distinct congregations can be identified in Gwembe South sub-district alone.

There has been a dramatic shift to a cash-based economy, primarily through employment, cotton production, fish, and other valuable local exports. Shops, taverns and markets have proliferated. From the towns, fish mongers, animal dealers, and dealers in other commodities ply the valley with trade goods and with cash, to trade for local products that can again be sold in the towns at a profit.

Maamba Collieries, Buci Farm (a 2,500 hectare commercial farm near Sinazongwe producing cotton and wheat), the numerous Kapenta Fisheries spread along the shore of Lake Kariba and on its islands, the large number of Bemba, Lozi, Luvale and Tonga artisanal fisheries, Mbwiko and Mapatizya amethyst mines, the irrigation schemes at Nkandabbwe, Buleya-Malima and Siatwiinda, the many programmes of the Gwembe South Developement Project, as well as other government operated or government assisted institutions all serve as sources of cash entering the local economy. All have highly visible structural impacts on the face of life in the Valley. But behind the veneer of progress that these developments herald and the roughly ten to fifteen thousand who are directly affected by their presence, are another forty thousand people in Gwembe South; an invisible body struggling daily with failing soils, with dwindling stock and water supplies and illness.

These, the vast majority of residents of Gwembe South, are not seen and they are not served. The surface developments I have called "a veneer" masks fundamental changes that are now taking place in the hinterlands, off the roads, into which Tonga farmers and their families are increasingly moving in efforts to better their conditions.

Development, at least humanitarian assistance such as is the work of Gossner Mission and Gwembe South Development Project, is concerned with the same goal : betterment of the conditions of the inhabitants of Gwembe South. In order to best assist the people of Gwembe South in this common goal of self-betterment, Gossner Mission and GSDP must understand the conditions in which the great majority now live. This can help Gossner Mission and GSDP to place their programmes in perspective. It may also help in assessing the operation and impacts of current programmes, and in considering policies, opportunities and needs for the future.

POPULATION AND RESOURCES

Gwembe Valley and its inhabitants are now in the grips of change far more dramatic than the more visible advances in national, commercial and industrial integration described above. In the past thirty years, since the mid-1950's, population of Gwembe District has increased roughly 2.27 times. From approximately 55,000 residents in the entire district in the fifties, population in the district is now estimated to have reached 125,000 inhabitants as of January 1988 (Colson 1960:6, MAWD January 1988). Of these estimated 125,000 inhabitants at least 55,000 are reported to live in the Gwembe South sub-district, between Chiabi at the southern edge of Gwembe Central, and Siampondo, at the southern end of Lake Kariba.

The population of Gwembe South today is as large as was the population of the entire district at the time of the construction of Lake Kariba. And while population in Gwembe has been increasing at a rapid rate, the resources on which that population relies have dwindled almost as rapidly.

Soils and Their Relation to Subsistence

The greater part of the valley's arable soils were inundated with the filling of Lake Kariba. Recently, a "Paper for Preparation of an ARPT Farming System Zoning in Gwembe District, Southern Province" (GTZ 1988) reports that apart from limited alluvia "along the Zambezi and its tributaries (sic)", presumably below the dam, there are only approximately 40,000 hectares of arable soils (alfisols) suited to cultivation in Gwembe District. These are described as "less fertile, but suitable to support semi-permanent cultivation." Indeed, over the district as a whole, given the estimated population figures of 125,000 souls, the average theoretical holding of land available to each is .32 hectares. This is far below what is needed for subsistence based on rainfed cultivation of grains under current horticultural regimes. Most of these arable soils, throughout the valley, are already under cultivation. The GTZ preparation paper cited above states that "degeneration of soils due to over-utilization and erosion is a problem in some densely populated areas" (GTZ 1988:2). This statement is clearly based on information gathered years ago. This has been the case since at least the beginning of this decade, when new arable soils available for fields were already scarce. Perusal of aerial photographs from the 1980 series demonstrate this clearly.

The soils of Gwembe South, already inadequate to support the additional population relocated in 1958-60 are especially stressed. They have undergone near constant cultivation and expansion since that time. Now, there are no uncut arable soils available in Gwembe South except scattered pockets now being sought out in the escarpment hills.

Soils in Gwembe South are shallow, stony, sloped and relatively infertile compared to previously cultivated soils along the Zambezi River margin. They have since undergone division and sub-division to meet the demands of a burgeoning population. Without application of amendments, fallow, or the use of soil-conserving plowing techniques to inhibit erosion most fields are now hopelessly degraded, badly eroded and su-divided into small

parcels that yield only a portion of what is needed for annual consumption. Data collected from 84 villages in the hills and valleys along the district road between Chiabi and Siampondo indicate that the shortage of land is now widespread and critical.

Men and women in all these villages, except those in Muuka, near the Zhimu River, in Mwemba Chieftaincy, Sinankumbi in the hills near Maamba Township, and in Siampondo on the extreme far southern end, indicated that there were no more arable soils to be cut as ntemwa fields in their areas. They explained that they rely now on zikuba fields (fields that have been cut and cultivated for more than five years) that yields from these are poor, and that they know of no uncut arable soils in their areas. I have confirmed the lack of cultivable soils for much of the area of Gwembe South through examination of aerial photographs available in time series for 1970 and 1980, in the Land Use Office, Mulungushi House, Lusaka, at the Ministry of Agriculture and Water Development. These photographs demonstrate graphically that even as early as 1980, room for expansion, at least on the valley floor, was at an end. Scudder, Colson and Scudder had already indicated this impending crisis in their report on GSDP in 1982. The crisis is here.

In Siameja neighbourhood, perhaps an extreme example because of its relatively large population (est. at 584 families comprising roughly 3,504 souls, I have extracted at random a census on the 1988 harvest sampling 60 adult men. 1988 was a year of late but sufficient rains. I have measured harvest size by sledgeload. By my calculations a sledgeload will contain either the bulk or mass equivalent to two 90 kilogram bags of maize. The sample provides the following results : Maila, a sorghum, was the predominant crop planted, primarily because it is better suited to local conditions. The average harvest of maila for men of the sample was 2.8 sledges. Nzembwe, (bulrush millet) was the second most heavily planted crop, because of its hardiness. Sample men harvested an average of roughly .75 sledges, or $\frac{3}{4}$ of a sledte. The average harvest of maize for this sample was .38 sledges, while only a handful of ciganigani, a sweet sorghum

used for brewing, was harvested when averaged out over the 60 men of the sample. The average total harvest of grain for this more or less representative sample of Siameja men is less than four sledges.

Sample size	Neighbourhood	Mapopwe (maize)	Maila (sorghum)	Nzembwe (millet)	Ciganigani (malt sorghum)
37	Nkandabbwe	4.1 sledges	.48 sledge	.81 sledge	.57 sledge
25	Buleya-Malima	5.24 sledges	0 sledge	.88 sledge	.08 sledge
19	Siatwiinda	8.8 sledges	.77 sledges	3.6 sledge	0 sledge
60	Siameja	.38 sledge	2.8 sledges	.72 sledge	.038 sledge

Figure 1. Comparative Table of Grain Crops Yields in the survey neighbourhoods, 1987-1988 season.

Cotton, because it is generally not suitable for cultivation in the shallow, stony soils of Mwemba, was planted by only a few. Three small (maize) bags were harvested out of the entire sample. Additionally, this sample calculation does not include harvests from the fields of wives. I have this data but have not included it in the calculations since it appears that doing so would increase the sample size but decrease the average yield. Most women associated with the sample harvested less than their husbands. Similar situations are common throughout Mwemba's area though perhaps not as extreme in most cases. The few grain crops that did germinate and reach maturity were attacked by armoured crickets (bacimvwiinye) and locusts known as nsabandwa. Predations by these pests further reduced what yields farmers were able to take from their fields.

Water

Arable land and chronic shortages of grains are not the only problems confronting residents of Gwembe South. Of the 84

settlements throughout Gwembe South for which I have been able to collect such data, residents in 70 settlements, 83 % currently rely on shallow wells they dug into the sands of dry streambeds for all domestic water supply. At the time of re-settlement the areas in which they now live were, because of lack of natural perennial water sources, in many cases provided with boreholes and wells. For the most part these are now out of service, broken down or dried up. Residents in thirteen settlements out of the eighty-four I censured had access to an artificial water supply, either borehole tap, well, or dam. These eighty-four settlements are not simply marginal settlements "far off the beaten path". They are the main villages comprising the neighbourhoods of Chiabi, Malima, munyati, Siamuyala, Mwezia, Sinakoba, Muuka, Nyaanga, Dengeza, Siameja, Sianzovu, Siawaza, Kafwambila, and Siampondo. I have collected such information also for an additional thirty villages in the areas of the irrigation schemes, and surroundings, and though I have not tabulated these with the others, they demonstrate the same fundamental problems in water supply. They are only blessed in the fact that if they do not live too far from the scheme site, their women may walk to the irrigation canals to wash and to collect water for drinking. Usually, however this involves a walk of more than half an hour so that if a stream is closer, many in these villages also draw water when it is there, from streambeds. Others do not have this choice and so are less fortunate. Women in some villages such as at Siampondo, claimed to be walking more than four hours daily, making two trips to distant streams to collect water for the homestead. While this is an extreme case it is common that women in most villages in Mwemba Chieftaincy must walk some forty minutes one way to collect the homestead's water. This is done twice daily with women carrying 20 litre containers on their heads. These distances decrease during the rainy season when shallow wells can be dug more closely to the homestead.

Stockholding : Cattle, Oxen and Goats

Cattle and goats today are as an important an economic and ecological aspect of Tonga Organization as they have ever been. Both cattle and goats are now much affected by a decreasing area of land available for grazing and losses due to disease.

While numbers of adult men and women have much increased in the past years, the carrying capacity for cattle in Gwembe South has decreased as a result of expansion of fields into former grazing lands. Cattle are now scarce, in relation to the numbers of people who hope to obtain them.

Cattle diseases also, such as liver fluke, are common. Goats, on which Batonga rely for much of their protein are also much affected today by disease. Sarcoptic mange (cikwekwe), a disease usually fatal to goats in Gwembe, is very common in Gwembe South. Highly contagious, in many cases it eliminates an individual's entire flock so that he or she must start again the difficult and time-consuming process of building up a core of manageable and productive animals.

Though five veterinarians are posted in Gwembe South at Malima, Sinazeze, Sinazongwe, Kanchindu and Siameja, they do little but lament the lack of animal medicines and transport. They are sometimes able to assist locally if an individual can obtain the necessary medicines. In their stead, some concerned individuals have taken to injecting their own cattle, and may treat the cattle of others for a fee.

I censured samples of animal holdings at four sites across Gwembe South, to gain an idea of average holdings in the different areas. In the northern end, in Chief Sinazongwe in the area of Buleya-Malima Irrigation Scheme a sample of fifty men revealed an average cattle holding of 6.57 cattle per adult male. At Nkandabbwe, with a sample of thirty-seven men, the average cattle holding was 3.62. The main constraint there is said by farmers to be a lack of graze. At Siatwiinda, a small sample of 19 men gave an average cattle holding of 5.31 per adult male. Average cattle-holding within Siameja's sample of sixty adult men is 5.16 cattle per man.

Residents of Chief Mwemba, with fewer arable soils to cultivate, rely to a greater extent on animals which can graze the bush vegetation on otherwise unproductive soils. Their herd and flock sizes reflect this emphasis, though their slightly larger animal holdings do little to offset the shortfall in grains.

Goats are an important source of protein and cash and are also needed to meet obligations in the context of funerals, offerings, etcetera. They are also now under grazing pressure. Difficulty of herd management has increased since goats must now seek graze far from the homestead, so that it is more difficult to maintain large holdings, even if the flock has survived the ravages of chikwekwe.

Goat-holdings in the area of Buleya-Malima were 3.8 goats per adult male on average, in the same census cited earlier. Sample men at Nkandabbwe held an average of 4.1 goats. Siatwiinda area men in the sample held 2.9 goats per man on average, while the sample of 60 men at Siameja gave an average result of 6.95 goats per man.

Possession of oxen is also an important consideration since local movements of goods, materials, grain, and much of the work of plowing depends on access to a team of at least two oxen.

In the area of Buleya-Malima, the sample of 25 resulted in an average of 1.2 oxen per person. Seventeen out of twenty-five men had less than a team, either having one ox only or none. Eight men, on the other hand, had 2 or more oxen.

In the area of Nkandabbwe the sample of 37 men showed an average holding of .75 oxen per man, with a total of 28 oxen. Twenty-nine out of thirty-seven men had fewer than a team, while eight men out of these thirty-seven had two or more oxen.

Siatwiinda men in the sample of 19 held an average of 1.47 oxen each. This conveys a deceptive impression, however, since at Siatwiinda more than 50 % of the sample had no oxen at all

(11 men), while 5 men, (26 % of the sample) owned between them 22 oxen (78 % of the oxen) of the 28 owned over the entire sample. Inequality in the holding of oxen is more marked at Siatwiinda than in the other areas considered.

At Siameja the average holding of oxen across the sample of sixty men was high at 2.8 oxen per stock holder. Half the sample, thirty men had one or more teams. Eight men had only one ox, while 22 had none.

Given decreases in the lands available for grazing, and the growing human population, the expectation that all can hold cattle, oxen and goats is increasingly untenable. This is an important consideration, since apart from other utilitarian implications, cattle and stock continue to be the central means for Batonga, of saving and accumulating wealth through possession and reproduction.

Batonga today continue to view cattle as the most secure form of savings available to them. Certainly cattle holdings have proven a better investment than cash savings over the last decade given the continually diminishing value of the Kwacha in buying power. Cattle, on the other hand, are continually revalued in relation to other goods and cash, so that their "value" and purchasing power have remained more or less constant. A person for example, who five years ago had put K 100 in savings would today have only a fraction of the buying power he or she had had at the time of the deposit. Conversely, one who had invested the money in a cow, at the same time would, if the animal survived, have increased his or her investment many times, since the cow today might command between 700 and 900 Kwacha. In addition, for each calf that the cow had born in the meantime, accrues to the owner roughly an additional K 500 above the value of his original investment of K 100 in the cow.

Most Tonga recognize the desirability of this form of savings and continue to be committed to cattle as the most rewarding form of investment and savings, despite pressures to invest in credit unions, banks, and other savings schemes.

Land pressure however, now diminishes the availability of this option. Young men today lament that the larger herds of their father's days are no longer possible due to decreased land for grazing. Older men shake their heads in resignation as they lose cattle to drought or disease, or as they grudgingly decide to sell a remaining ox or cow for cash with which to buy meal. Young and old see the current lack of graze as a large part of the reason for their present impoverishment, and as further source of suffering.

Relocation and Emigration

In most of the areas in Gwembe South, men and women explained that over the past five years more and more people have begun to uproot from their villages of long residence, and to leave the area in search of fresh soils and adequate grazing land for cattle. Some have moved only a dozen kilometers away from their former villages, up into the escarpment hills where they have found a pocket of land suitable for cultivation, surrounded by bush in which there is less competition for their cattle and goats. This is the case for the people of Kalinsanga and Cinego, now settled in the escarpment hills, though formerly they were of Siameja and Dengeza. They have succeeded in establishing small closely settled homesteads spread across pockets of exploitable soils far from the District road. Others in large numbers have now moved into the escarpment hills to form small, isolated hamlets. These settlements usually consist of a man, his wives, their children, one or more married sons and their spouses and children, since the pockets of arable soils they are exploiting will not support larger settlements.

The people of such isolated settlements then generally take on the name of the nearest established village headman and operate under his authority. For example, most settlers scattered in the escarpment hills northwest of Siameja are said to live under the authority of Siameja Zilundu (Siameja of the Hills), a previously existing escarpment village, although the

newcomers are all river people who came into the area originally in 1958 when Siameja people were moved up from the river.

Others, though it is not clear in what numbers, though they maintain a residence in their villages of long settlement, have established second residences in the hills, to which they move during the rains to cultivate soils they have cut there. Those who do so appear to be predominantly polygynists who are able to divide their household so that at least one wife and her children or relatives can maintain a residence there the year round. Where such a munziwaabili (second village) has been established and can be maintained, often all, or a large portion of the homestead owner's stock will be kept there as well, so that competition for grazing is minimized.

The escarpment hills are rapidly being taken up by men and women fleeing from hunger, and from other stresses brought on by hunger.

In an alternative avenue, to escape the difficulties of farming in Gwembe under such conditions many former residents of Gwembe South villages have begun a stream of migration to new soils in less heavily settled areas on the plateau or on its borders. Many from Chief Mwemba have already moved to Chikanta Chieftaincy some 60 kilometers northeast of Kalomo on the plateau, where they are pioneering new soils. There they are known by earlier inhabitants as "Bana Zambezi". Others, particularly from Sinzongwe Chieftaincy are in the process of moving to Muziyo, in Chief Moyo, at the edge of the plateau. Most such permanent emigration up to the plateau seems to be channeled to these two general areas. It is a dramatic shifting of population and it is still in progress as more and more, people of Gwembe South struggle to respond to the increasing failure of available soils to produce sufficient grain on which to subsist.

Cash Cropping, Trade and Subsistence

Tonga in teh Valley today, probably more than ever now participate in and directly rely on national and world economic relationships. Opportunities that have come to them by which they are able to offset in some degree the increasing failure of past subsistence strategies have come in the guise of participation in a cash market. Many in Gwembe South who are adopting new strategies to reduce risks are attempting to do so through agriculture, relying increasingly on cash crops such as cotton and sunflower, that have shown some tolerance to drought and degraded soils. This is so primarily in Chief Sinazongwe. In Mwemba, with its inherently poorer soils, men and women innovate attempting other commercial strategies to gain cash needed to buy grain, meal, and other necessities.

In Sinazongwe Chieftaincy as in Chieftaincies in Gwembe Central and Gwembe North, farmers have shifted to crops that appear to reduce agricultural risks. Cotton production supported reliably by the Lint Company of Zambia, a parastatal, and production of sunflower supported with inputs and marketing by SPCMU, have become for most in Sinazongwe Chieftaincy a principle foundation in their agricultural strategies.

These strategies, agricultural and commerical, place Batonga in more vulnerable dependencies on the operation of national and international infrastructures and relationships. Men with whom I spoke claimed to have less and less freedom in the framing of their choices, given the increasing precariousness of cultivating grains in their now degraded soils. On the other hand, cash-cropping, especially in cotton, can be quite profitable and Batonga are aware of this. But they are also aware that they cannot eat cash in the rainy season when transport of any kind on the District roads is rare and their granaries are empty. Most are also aware that the cash income they receive for a crop of cotton or sunflower is likely to be quickly invested or otherwise spent so that it will not be readily available to

use to offset the lack of meal when they and their families are facing hunger. Most of those in Sinazongwe and Mwemba Chieftaincies with whom I spoke are well aware of the risks of cash-cropping and a reliance on commerce and trade but claimed to have less and less freedom in the framing of their choices, given the increasing precariousness of cultivating grains on their now degraded soils.

In Sinzongwe Chieftaincy where I was able to collect two separate censuses on crops and yields for the 1988 harvest I found 72 villagers around the Nkandabbwe Irrigation Scheme to have harvested a total of 59 tons of cotton which they sold for an average cotton income of K2,461.00 per farmer. Fifty farmers in a sample from around Buleya-Malima Irrigation Scheme produced between them roughly 81.5 tons of cotton, for an average estimated cotton income of roughly K 4,887.00 per farmer. Conversely, in Mwemba Chieftaincy, men in the Siatwiinda sample of 37, produced altogether only 6 bags, while the Siameja sample of sixty men produced a total of 3 bags. None of the men in these four samples grew sunflower. Those who do grow claim that by planting cotton, one is almost guaranteed to harvest something, even if only a few bags. Lintco provides inputs in a timely manner, often on credit, and buys, collects the harvest and pays, generally within the space of a few weeks. This provides an immediate, often substantial cash income which can be immediately used to buy meal to substitute for grains they did not or were not able to grow. In so doing farmers are also able to take advantage of the government subsidy on mealie-meal, during the periods in which meal is available. Unfortunately more often than not meal is not readily available, or what meal is available in the local shops is rapidly bought up, within hours of arrival, so that families often continue to live on the edge of hunger despite having the money with which to live in sufficiency.

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Roads and Transport

There are some 170 kilometers of District road in Gwembe South. A roughly 30 kilometer section of this road was paved with tarmac in 1967-68, extending the pavement from Sinazeze to Maamba to provide tarred road access between the line of rail and Maamba Collieries. The remaining 140 kilometers of District road is dust. The dust road is relatively well-maintained for about twenty kilometers from the points where it diverges from the tarmac (to continue as the District road) at Sinazeze moving northward toward Chiabi, and at about 5 kilometers north of Maamba, where it heads southward toward Siampondo. In the north the dust road is relatively good until it reaches the area of Malima, after which it declines rapidly into ruts, bumps, potholes and washed out streambed crossings along the remaining 18 kilometers to Chiabi. Overall road distance from Chiabi to Sinazeze is approximately 38 kilometers.

From just outside Maamba where the dust portion of the District road diverges southward to Siampondo at the end of the road, is approximately 100 kilometers. again, the first fifteen kilometers of this portion are relatively well maintained until one reaches the turn-offs to Siatwiinda pilot Irrigation Scheme and Kanchindu/Sinakoba. From this point the road becomes immediately worse, treacherous particularly with sand and rocks, becoming increasingly more deteriorated as one approaches Siameja. From Siameja to Siampondo, the road is nearly impassable for a two-wheel drive vehicle as a result of ruts, stones, sands and washed out streambeds crossing the track. The conditions of two feeder roads branching off from the District road to Maamba via Sinkoba, Sulwegonde and Sinankumbi (roughly 25 kilometers), and a twenty kilometer road from Siawaza, in the extreme southern end, to Kafwambila, are even worse. A self-help programme assisted by GSDP is currently carving a new roadbed across the hills, from Siawaza to Kafwambila to replace the old feeder road which is now for all purposes impassable by motorcar, choked with sand.

These roads, as well as the District road from Kanchindu southward, and from Malima northward, are now so bad that private transporters refuse to use them because of excessive wear on their vehicles. The fact that these roads were mined during the Zimbabwean war for Independence is also a factor considered by private transporters who have decided to place these roads off-limits for their vehicles.

For the most part these roads are now only used by government or project vehicles, and the relatively few vehicles of entrepreneurs with interests in entering the areas, such as Kapenta Fishermen and various traders. Indeed, during the relief exercises of 1987 to March 1988, only the vehicles of Contract Haulage and the lorry of Gwembe South Builders carried supplies into the area, according to VSP agents at various depots. Very few vehicles enter the areas south of Kanchindu or north of Malima. Transport to services as a result, is very scarce and when it can be arranged on an ad hoc basis, it is usually very expensive.

Common prices asked for transport one way, for example, from Siameja to the mine hospital at Maamba, plus a fee charged for baggage is K35.00. From Siatwiinda to Maamba, a distance of about 25 kilometers, fees charges are K6 or K7, presumably since vehicles are less scarce, and the distance is somewhat (but not proportionately) less. However, if one is transporting goods from Siatwiinda area to Maamba for sale, a higher fee is demanded of from K25 to K30 for a bundle of dried fish.

Transport costs are exceedingly high; in some cases prohibitively high. Men and women in need of reaching one of the towns for hospital or for purchasing needed spare parts, seeds, hardware, medicines, meal or other goods often have virtually no choice but to make do without.

Likewise, the scarcity and high cost of transport results in a serious lack of goods in the small private shops that have sprung up in villages off the district road. I discussed shops in more detail in what follows, however, as an example of the impacts of transportation constraints : the proprietor of the

only shop now operating in Siameja manages to keep his shop supplied often only by weekly trips to Maamba on his bicycle. This is a return trip of some 140 kilometers, half of which is made with a heavily loaded bicycle over difficult road. In contrast, during the early 1970's the bus service reached Siameja. This service, broken off by the Zimbabwean war of Independence, has never been re-instated.

The problems existing as a result of transport are profound given that few in Gwembe South are able to produce sufficient grain crops for subsistence. Those who rely most on outside sources of meal are people in the very areas where transport is most scarce. A failure of grain harvests this year, in many cases more severe than the massive failure in 1987, and the lack of any overall relief exercise this year, has prompted many men and women in the affected areas from Ciabi to Siampondo, Kafwambila, Siameja, etc., to travel scores of kilometers on foot and with donkeys, women and children in search of meal. Parties of women from Sinakoba, Muuka or Siameja can be met on the road, en route to shops at Siabaswii, where they wait until a shipment of meal arrives. For these people the situation is desperate. A relief exercise attempted by GDSP, laudable in intent, could not be begun in a systematic way until very late in the year, when the roads can be expected to become impassable at any time due to the onset of the rains. During the first week of October, I encountered a party of several men with donkeys hailing from Kafwambila some 60 kilometers distance via footpaths through the hills in search of meal they hoped to bring back for their families. The lorry of Gwembe south Builders, which makes weekly trips to the area of Kafwambila to supply the crew working on the road has, through the initiative of Mr. Wilson Ncite, made the only consistent effort to bring in supplies of meal to the area. But the supplies this lorry brings, once weekly, are only a drop in the ocean and are invariably purchased within a few hours of arrival.

Though they have money fr

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Though they have money from the sale of cattle and other goods, the distance, the poor quality of the roads and the scarcity of vehicles in relation to demand, and the failure of subsistence strategies means that a great many of the people of Gwembe South remain now with little or no alternative to hunger.

Impetus for Local Shops and their Constraints

Many individuals throughout Gwembe South have been able to raise capital with which to open shops. Most villagers rely on these local shops for highly valued commodities and amenities such as mealie-meal, soap, matches, aspirin, washing powder, clothing, tobacco, paper and pens, or more rarely, sugar, salt or cooking oil.

In view of most village residents it is a fortunate that has an active shop-owner who goes to great lengths to bring in commodities that people clamor for. Shops undertaken by such men are viewed as a public service although it is commonly understood that the owner is an entrepreneur and operates his shop in order to make money. Much of the failure in commercial development fostered by programmes supported by GSD can be tied to GSDP's requirement that enterprises supported be undertaken in a "cooperative" framework -- a framework that most Batonga will struggle mightily to avoid.

I was able to count 41 shops throughout the main neighbourhoods of Gwembe South, apart from a large concentration around Sinazongwe, the sub-boma. There are 4 shops in the area of Chiabi and 10 substantial shops at Malima some 18 kilometers distance, at Malima, towards Sinazeze. One of these shops, owned by Mr. Muntanga (also Ward Chairman and a tavern-owner) is kept supplied with a lorry purchased by the owner for that purpose. There are three shops around Buleya-Malima Irrigation Scheme. One, owned by Mr. Syanan Kamuna is also kept supplied with the owner's private lorry. This lorry also provides transport to and from Choma at K20 each way. The owner claims to make three trips to Choma weekly, on Mondays, Wednesdays and Fridays, to collect mealie-meal, which he claims is in great demand. He generally

brings orders of 200 25 kilogram bags each trip. In the Nkandabbwe/Sinazeze area there are nine shops of various sizes, five of them substantial, Mr. Weken Siapwaya, Ward Chairman for Nkandabbwe Ward is a major shop owner and also owns a pick-up van which he uses to supply his shops and local transport between Choma and Maamba for a fee. Siamuyala, approximately ten kilometers from Sinazongwe, near the Buci Farm, has one shop, for example, owned by Mr. Siapwaya. There is one shop at Mwezia, on the tarmac road between Sinzeze and Maamba. There are six shops in the Kanchindu/Siabaswii/Siatwiinda area, of which 4 are operating fully. One of these is the Maaze Consumer Cooperative, assisted by GSDP. South of these shops concentrated at Siabaswii, and west through the corridor to Maamba via Sinakoba, there is only one other shop in Gwembe South, at Siameja, due to the difficulties of bringing in goods. There are no shops at all in the neighbourhoods of Sinakoba, Sinankumbi, Muuka, Dengeza, Nyaanga, Kafwambila, Siawaza, Sianzovu or Siampondo. The VSP Depots are all inoperative and in many cases do not exist.

The major constraint facing these shop owners in their efforts to provide desired commodities to neighbourhood markets is the unreliability and in some cases, as we have seen, the inavailability of transport. In some cases, after purchasing goods in Choma or Maamba and delivering receipts to a transport firm with payment in advance for pick-up and delivery of the goods, they must often wait several weeks before delivery is actually made.

In Chiabi this year for example, where there is a serious lack of meal, two of the four shop owners purchased mealie-meal on the 7th of August in Choma. They immediately submitted the receipts and payment for delivery to VSP, whose officers accepted the order. Five weeks later, by the 16th of September, the deliveries had still not been made. Women are walking the 18-20 kilometers to Malima, where the nearest supplies were, carrying the 25 kg. bags of meal back home on their heads.

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One of the shop owners, who had by that time been waiting for more than a month for delivery, very heatedly edclaimed that they would "all die of hunger waiting for VSP." The orders were finally delivered in two loads on the 7th and 8th of October after a delay of two months.

Instead of delivering the meal with their lorry, VSP officers had passed the orders on to the GSDP Transport officer. He had been instructed that GSDP programme requests for transport have priority in the use of the lorry of the no longer extant Gwembe South Builders. Programe requests for the lorry often came in an hoc for use on the same day as the request and as a result the deliveries were repeatedly put off. Finally the Transport Officer resolved this situation by viotating the policy of programme priority when he relaiyed, after meetings to organize a relief operation, that the shop owners were themselves attempting to respond, privately, to the same crisis as thsoe GSDP, VSP and maaze staff who were in attendance at the relief operation meetings.

The local shops could be quite effective means for channeling resources for sale in the local areas, but they are hampered by a lack of transport and by operating outside the GSDP umbrella. In virtually every large neighbourhood in which I interviewed along the District road and feeder roads in Gwembe South, are individuals with capital and interest to open shops if transport were available to supply them. In each neighbourhood, I asked for the names of individuals interested in opening shops, and was often told of one or more who has already applied for a licence -- despite the serious handicaps they would face in view of scarcity of means of supply.

Such local entrepreneurs face a serious disadvantage in that their activities are not ideologically correct in a political climate that favours cooperative enterprises -- despite the fact that the most successful are usually party officials.

But such entrepreneurs and their communities enjoy a real advantage, in that responsibility and consequences of success or failure are immediate and unambiguous. Such entrepreneurs are working with their own capital to make a profit, and in so doing make sacrifices necessary to bring goods into their communities. Despite this dynamism however, they are far too few at present to meet the need for meal and other goods now felt across the two chieftaincies. In very large part their limited numbers reflect only the lack of transport and supply, rather than interest or financial ability to open and operate the shops and stores that are needed.

Health, Illness and Mortality

Health conditions in virtually all the settlements I visited are poor except in the scheme villages at Buleya-Malima and Nkandabbwe. Meal, and a variety of relishes are scarce, especially in Mwemba Chieftaincy where soils are poorer and where transportation needed to import meal is rare. Water supplies created years ago to support the resettled populations are now mostly broken down forcing villagers to rely on the meager waters that can be tapped by digging in local streambeds. Such sources are frequently contaminated with amoeba, worms, and waste, if they are in the watershed of a nearby village. Though I have discussed the state of soils and water supply throughout the sub-district elsewhere in this account, I am compelled to bring it up again here because of the important impacts they have on health and mortality.

Poor nutrition and contaminated water supply now contribute to an almost continual state of ill-health within a large part of the population of Gwembe South. Last year, in mid November, 1987 for example, when the working borehole at Siameja became inoperative because of an engine breakdown the entire population was immediately thrown into reliance on the very limited supplies in the sands of the Mweenda River. Rainfall on 21 November washed waste from the village site into the streambed. Within two days, virtually all in Siameja were badly affected with

dysentery and stomach disorders -- a situation that continued for several months, with a very high rate of mortality. Between November 22nd 1987 and December 6th, 1987 when I left Siameja, I recorded 14 deaths among the residents within the neighbourhood. In June 1988 when I returned, I recorded some thirty-six deaths that had occurred in the meantime within a sample population that constitutes only a rough one-third of the total Siameja population. Villagers estimated approximately three funerals held per week in Siameja neighbourhood during this period. Certainly, all these deaths cannot be attributed to poor water supply though the borehole was out of service for the bulk of six months for various reasons, including lack of fuel, once the engine was repaired. Though the pump resumed operation in June the high rate of death has continued. Even Siameja's much admired Clinic Officer Mr. Mumeka, died unexpectedly after a week's illness in December 1987. Water supply cannot be the only factor, but there is now no certainty about what other causes may be present. Though the situation in Siameja seems to be worse, the great majority of villages throughout Gwembe South have experienced a similar rapid rise in the frequency of death over the past two years. These will be discussed later in this section.

For the present, it should be noted that the greater number of people of Gwembe South now live in a very low state of resistance to disease -- certainly in part as a result of present poor nutrition and water supply. Parasites such as worms are common and contribute to anemia and a low resistance. Complications in pregnancy and child-birth, often due to anemia and venereal diseases also constitute major health crises -- especially when transport constraints and distance from adequate medical facilities, lack of medicines and training make urgent care almost impossible for most Gwembe South residents. In these contexts, traditional healers (banhangha) and diviners (basondi) are sought out with great frequency.

Health Care Services

Clinics operate in many villages throughout the area. These are generally understaffed and undersupplied with medicines, and are usually able to do little more than refer the more serious cases to a large clinic at the sub-boma at Sinazongwe or to the hospital at Choma. A hospital run by Maamba Collieries operates in Maamba Township but its services are generally available only to mine employees. In very urgent emergency cases the mine hospital has admitted patients for treatment. However, generally all serious cases are referred to the government hospital at Choma.

A clinic at Malima with six beds, Sinamalima Clinic, now serves virtually all residents on the northern end of the sub-district. A small clinic with no inpatient facilities on the Irrigation Scheme Site at Buleya-Malima has recently been built, but is not yet fully operational. This will greatly assist residents in the Siakaputa, Sinanjola, Muntuwamasiku areas, who until recently have had to walk on the order of 10 kilometers to gain access to remedial health care at Sinamalima.

One four-bed clinic at Sinzeze serves the population in the area of Sinazeze, Nkandabbwe and the GSDP settlement some five kilometers northwest of Sinazeze. Another, a larger clinic at the Sinazongwe sub-boma serves people locally, and as far away as Siamuyala, Makonkoto and Mwezia. A clinic at the commercial farm of the Gwembe South Development Company is available only to employees at the farm. A clinic at Kanchindu serves the very dense populations of Muuka (est. 2,802 inhabitants), Sulwegonde (est. 2,790 inhabitants), Sinakoba, Kanchindu (est. 4,536 inhabitants), neighbourhoods, and the even more densely settled populations in the villages around the Irrigation Scheme at Siatwiinda. People of Muuka who must use this clinic, which is the nearest, must walk some 24 kilometers, if they are able.

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Those who live at Sinakoba, conversely, must walk only approximately 13 kilometers to reach their clinic at Kanchindu. The next clinic is located at Siameja. Dengeza people, who use this clinic must travel some fifteen kilometers to do so. If possible however, Dengeza people prefer to make the trek over the escarpment hills to Maamba where they are more assured of treatment. Dengeza, Nyanga and Siameja people all use the small clinic at Siameja, operated with one clinic officer, for the most immediate access to primary health care, despite a chronic lack of supplies. In addition, a small clinic at Kafwambila operates to serve the local populations, though as are most of the others, it is seriously constrained by lack of supplies and equipment. The clinic at Kafwambila also must serve residents of Siampondo, some 25 kilometers distant. Residents of Siampondo, as well as those in the Siawaza and Sianzovu neighbourhoods also attempt to rely on the clinic at Siameja, which, because of terrain, is nearly equidistant with Kafwambila.

Many of the larger neighbourhoods without clinics have community health workers. These are usually young local men trained in first aid at the clinic at Sinazongwe, supposed to be supplied intermittently with first aid drugs and equipment. But because of their limited training and very limited, often non-existent supply of medicines, community health workers seem rarely to be consulted.

When clinics or health workers fail to provide an effective treatment, patients are referred in all cases, from Chiabi to Siampondo, to the hospital at Choma. As this course involves much time, chance and expense, it is often not taken.

Recent Increases in Mortality

Throughout Gwembe South, as in other parts of Gwembe, there is now much talk of a dramatic increase in deaths during the past two years. Therefore, in the four census locations spread across Gwembe South I asked individuals to assist me in compiling

lists of people they knew who had died within the past year, from September 1987 to September 1988. In each area I collected list of between 30 and 40 deaths in the personal networks of those interviewed. The following list, taken from a village in the neighbourhood of Siatwiinda, is exemplary.

<u>Number</u>	<u>Sex</u>	<u>Age</u>	<u>Year of death</u>	<u>Cause of death</u>
1.....	M.....	47	1988	A.I.D.S. (diag. Lusaka)
2.....	M.....	74	1988	not known
3.....	M.....	7	1988	"yellow fever"
4.....	F.....	4	1988	"yellow fever"
5.....	F.....	3	1988	"yellow fever"
6.....	M.....	72	1988	not known
7.....	M	52	1988	malaria
8.....	M	60.....	1987.....	A.I.D.S. (diag. Lusaka)
9.....	M.....	19.....	1988.....	swollen appendix
10.....	F.....	60.....	1987.....	not known
11.....	M.....	50.....	1988.....	body swollen
12.....	M.....	50.....	1988.....	not known
13.....	M.....	23.....	1987.....	suicide
14.....	M.....	80.....	1988.....	not known
15.....	F.....	49.....	1987.....	not known
16.....	M.....	48.....	1988.....	not known
17.....	M.....	11 mos.....	1988.....	"yellow fever"
18.....	M.....	1.....	1988.....	"yellow fever"
19.....	M.....	2.....	1988.....	not known
20.....	M.....	8.....	1988.....	"yellow fever"
21.....	M.....	31.....	1987.....	A.I.D.S. (diag. Lusaka)

22.....	F.....	1.....	1988	Anemia
23.....	F.....	60.....	1987.....	not known
24.....	F.....	6.....	1987.....	not known
25.....	M.....	47.....	1987.....	A.I.D.S. (diaet Lusaka)
26.....	M.....	50.....	1988.....	not known
27.....	F.....	2.....	1988.....	malaria
28.....	F.....	56.....	1988.....	asthama
29.....	M.....	80.....	1988.....	cancer
30.....	M.....	8 mos....	1987.....	anemia
31.....	M.....	1.5 yr....	1987.....	malaria
32.....	F.....	13 mos....	1987.....	malaria
33.....	F.....	aged.....	1988.....	not known
34.....	F.....	30.....	1987.....	not known
35.....	M.....	60.....	1987.....	tuberculosis
36.....	M.....	52.....	1987.....	not known
37.....	M.....	30.....	1988.....	not known
38.....	M.....	2.....	1988.....	cerebral malaria
39.....	M.....	7.....	1988.....	snake bite

Though I was unable to collect such detailed data in all of the neighbourhoods visited, men and women throughout Gwembe South recognise a higher incidence of death now than they have ever experienced. None were able to explain this, but all were willing to list symptoms or diseases which they hold, are responsible, having claimed a significant number of victims. I am aware that such information is exceedingly limited in epidemiological usefulness, as is the list I gave in preceeding pages, gathered from across the personal network of a single individual. But this in itself is significant, and it is of value to compare the lists of diseases identified as responsible for deaths in the various areas.

In the Chiabi area I was told by villagers that a great many, young and old, have died during the past twelve months. Most, they claimed, died of symptoms of malaria, tuberculosis, "leprosy", and stomach pains with dysentery. In the Munyati and Sinanjola areas I was told that they have experienced many more deaths than usual, especially amongst children, who died after relatively short illness, of about three days. They also mentioned many elderly as having passed away this year. At Siamuyala, near Sinazongwe, villagers claimed many deaths -- mostly children, of malaria and diarrhoea. At Mwezia, on the tarmac between Sinazeze and Maamba, I was told that a great many people have died this year, from children to the adults and the elderly, of fevers, diarrhoea, swollen legs and malaria. At Sinakoba in Mwemba, villagers told me that there had been many, a great many deaths in every age group; primarily of malaria, stomach disorders and purging, symptoms of tuberculosis or pneumonia, and swollen legs. In Sinankumbi, in the hills near Maamba I was told that more people than usual died this year, of all age groups, but was not able to collect a list of symptoms. At Muuka, some 25 kilometers south of Siabaswii, I was told again that a great many people had died, more than in years past, of all age groups. The usual symptoms were listed, but in addition Muuka people described a disease spoken of in other parts of the valley as "yellow fever". With "yellow fever", they explained, the eyes and palms turn yellow, followed by the death of the victim. They said that it is a new sickness, and that there is no name for it, as there is, for example, for A.I.D.S. (which is recognized as an old disease known as kafungo, resulting from, it is said, intercourse with a woman who has aborted, or a man who has slept with such a woman). The "yellow fever" they are describing has not been positively identified with clinical yellow fever. So far as I can determine Batonga are simply adopting today a recognized term, to denote that particular illness. However, as I have mentioned, I have noted its occurrence throughout the valley, from villages in the north and central sub-districts, as well as in the south.

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Dengeza people too, claimed many deaths, though I collected no lists. At Kafwambila, at the southern end of the lake I was told by the Clinic Officer "so many people have died -- far more than in other years. some just died, some after long illnesses, some after short illnesses. The young died of diarrhoea. Some died of malaria and diseases we don't know, and some died of "yellow fever".

Siatwiinda area residents reported several deaths they say were diagnosed in Lusaka as A.I.D.S., through blood testing. A.I.D.S. is certainly in the valley, in part through the mechanism of the artisanal fishing trade, which draws femal fish-mongers from the towns. At the fish-camps they exchange goods and often sexual favours for fish, in the context of well-established bond relationships they have formed with fishermen. It is unclear what range of symptoms are manifest in teh immune deficiency syndrome in the valley. Medical practioners in Southern Province are not able to discuss the problem without authorization. But a problem clearly exists.

.One of the four A.I.D.S. deaths reported in the Siatwiinda area (see above list) involves a 47 year old man. During the week after his death, three of his children died, one after another, reportedly of symptoms of "yellow fever". The deaths may hang together.

Despite uncertainty about the extent of A.I.D.S. in the valley I must emphasize my assessment, admittedly inexpert, that A.I.D.S. is widespread and is increasing in incidence. Clearely some disease organism new to the valley is involved in teh very high mortality during the past two years.

Though I have as yet worked out no quantitative evidence for mortality it is clear that the present rate is very high, and is predominantly related to disease. The disease etiologies need to be investigated, as well as epidemiology, before anything more conclusive can be said.

However, it is clear to the people of Gwembe South that they and their children are dying at unprecedented rates. Though they do not know how to explain it, the many deaths contribute to the sense of desperation with which they are coming to regard their situations.

Present and Future

The failure of harvests this year in much of Gwembe South is not a chance occurrence. It reflects an on-going collapse in a precariously balanced subsistence strategy pushed to the brink and beyond by a rising tide of population. As I have stressed elsewhere in this introduction to current conditions in Gwembe South, the soils of Gwembe South can no longer support the population under existing management practices. The crises and hunger that many are experiencing this year are likely to be repeated again and again, until the problem resolves itself, by a diminishing of the population through emigration, ill-health and higher mortality. These processes too, are already evident.

Most of the people of Gwembe South, as a result of alternative strategies they are able to exploit, have money to pay for the meal and other necessities they are not able to grow for themselves. For this short-term solution, what is missing is the logistical framework within which needed grains and goods can be transported to people in their remote areas. Though VSP (Valley Self-Help Promotion Society), could have profitably provided such framework through its lorry and depots spread throughout Gwembe South, it has not done so. For the present, transport logistics could be profitably organized as one key element that would return viability to habitation in Mwemba, and in other areas throughout Gwembe South, eliminating the brunt of hunger. But though crucial for the present it is a relatively superficial and costly solution, given the distances, road conditions, wear on vehicles, and drain on national resources.

Viability requires that Batonga in Mwemba and other areas of Gwembe South are again enabled to produce the bulk of their subsistence themselves. For any long-term solution to the current demographic and ecological crisis, a development approach is needed that is accessible to individual farmers on a very widespread and flexible basis, such as extension techniques in watershed improvement.

The Garbrecht study in the late 1960's developed some of these possibilities -- small dams, weirs, subsurface dams; means for trapping waters on their way down the escarpment, so that they can be harnessed with the costs and complexities in technical and social organization involved in pump irrigation. Scudder, et al. (1982) also mentioned such possibilities in their evaluation for GSDP at the beginning of this decade. They wrote :

So as to spread the benefits of irrigation over the largest area, it follows that initial emphasis should be on a larger number of small projects rather than on one or two middle-sized and large projects. Furthermore, if holdings are kept to 0.23 ha. (sic) and below, small projects of 1-2 hectares can serve up to 10 to 20 households which would justify the construction (or rehabilitation) of small weirs at the base of the escarpment or in hilly areas, experimentation with small sub-surface dams in the lowlands and further experimentation with handpumps for use under a wide variety of conditions including Kariba foreshore cultivation. (1982:19)

Such techniques, if developed appropriate to valley conditions and widely disseminated, could better conditions facing Batonga in water supply, nutrition and health, as we have seen, three of the most vital problems facing the majority today. Such improvements based on simple technologies and taught in extension, are portable; they can be transferred to new sites. They might serve, in addition, to take considerable pressure of the now overstressed rainfed fields.

Whatever other conclusions can be drawn from teh evidence in Gwembe South, the following points are clear.

1. Gwembe South has experienced a major increase in population over the past thirty years, in the district overall, from 55,000 to 125,000 souls.
2. At the same time soils available for cultivation have decreased in productivity, from overuse. They have decreased in extent, through sub-division amongst a larger population. A committment to cash-cropping, relying on still viable crops, does little to offset the shortage of grains when transport is not available.
3. Irregular access to staple grains or meal crates a situation of poor nutrition for a very large portion of the population.
4. Poor water supply further stresses an undernourished population by exposure to parasites and disease organisms, and by reducing the practice of sanitary measures involving the use of water.

These factors combine to create a nightmarish Malthusian cycle. Hunger, disease and want are resulting in a very high rate of mortality and emigration.

People struggle to see themselves as living in a state of normalcy. But increasingly this is an option only for the articulate few who do not rely on agriculture for their lives, who live within access to services, transport, water and shops -- who live within the veneer of development. The others, the many, struggle to cope but are beginning to see it as a downhill fight.

Present interventions do little more than scratch the surface. As for humanitarian development, the three irrigation schemes in Gwembe South assist fewer than 200 families out of more than nine thousand. These are fewer than 2.2 % of the population. Yet these three schemes absorb the bulk of development resources for the area and it is not even clear that two of them are sustainable.

Lintco, SPCMU, Kapenta and artisanal fisheries, Maamba Mine and a large commercial farm near Sinazongwe provide cash inflows but these are limited to a small portion of the population. And it is clear that cash does not mean that there will be meal to eat. Health services, extension, and transportation are woefully inadequate to offset the consequences of the increasing failure of subsistence on rainfed fields.

Hunger, illness, deaths and general want create a situation in which tensions lead to witchcraft and accusations of witchcraft and other processes of social disorganization. It is not surprising that a witchcleansing has been in progress in Mwemba Chieftaincy, throughout the period of my research there.

GSDP currently has at least two staff members who are familiar with techniques in watershed improvements; Mr. Wilson Ncite and Mr. Jaap Verweij, a Zambian and an expatriate.

That these points have been emphasized in the past but not explored may in part be an indication of the extent to which the pump irrigations have so absorbed the attentions and resources that GSDP has had to offer to agricultural development. But given the small numbers of farmers that can possibly be served via pump irrigation and the magnitude of the current crisis in subsistence, pump irrigation may well be an approach that the people of Gwembe South can no longer afford. At this point it is not simply a matter of development. It is survival.

These are some of the contexts in which the irrigation schemes and the Valley Self-Help Promotion Society depots now operate.

The Irrigation Schemes

The Gwembe South Development Project supports or assists three irrigation schemes : one at Nkandabbwe near Sinazeze, one at Buleya-Malima at the mouth of the Nangombe River, and a third, near Kanchindu, at Siatwiinda neighbourhood on the shore of Lake Kariba.

The irrigation and overall development of these three schemes across the years, since the early 1970's, with the exception of an earlier start at Nkandabbwe) have been sufficiently described elsewhere (Herlitz 1987). These histories will not be repeated here, since the history of the schemes is already well-known to Gossener Mission and GSDP. A brief description of the schemes should suffice here.

The schemes at Nkandabbwe, in the escarpment foothills relies on gravity flow of waters trapped and diverted to irrigation of nearby fields. It involves some 88 plots of .1 hectare, on 12 hectares of land. The two schemes at Buleya-Malima and Siatwiinda are both located near those of Lake Kariba. They rely on waters from the lake reservoir, which is presently pumped by diesel engines. The lake receded from between 1 and 3 ppm from both schemes. As a result of the dramatic drop in the lake/reservoir level by 1982, so that the fields of the scheme are now some distance from their water sources. Buleya-Malima irrigation scheme involves some 48 plots of one terrain each, covering 13.5 hectares. Of these plots, 45 are currently occupied and cultivated.

Siatwiinda Plot Irrigation Scheme now covers some 14.15 hectares, involving 74 plot holders holding .2 hectares each. Of these, very little is now cultivated and the scheme is essentially defunct, though water contrives to be pumped thrice weekly. Well beyond the height of the dry-season glowing period, 47 (64.3 %) farmers recorded zero sales from their fields, while 58, or 78.3 % reported sales less than the amount needed to pay their water fees of K257. During the months of September and October, cattle and goats grazed the meager crops remaining in the fields with little hindrance from farmers except to chase them when found, from their own fields on to the plots of neighbours.

The farmers of Siatwiinda were unwilling to organize to repair the lines of fence surrounding the scheme. There was little question, at Siatwiinda, of farmers paying their water fees despite threats from Farmers Executive Committee that plot holders not having paid by December would be evicted. At Buleya-Malima, too, most farmers tried by all means to avoid payment of water fees. During the time of my stay, which was at the very height of the growing season, only 11 of 43 farmers (25 %) had paid their water fees of K252 in full. Twenty-six farmers, or 60 % had paid less than half, while twenty-two, (51 %) had paid less than 75 Kwacha.

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The pump irrigation schemes depend very much on the involvement and cooperation of farmers to pay in part, operation costs, and to participate with labour and time, they are, as a result, highly vulnerable to problems of organisation cooperation.

Though problems now existing at Buleya-Malima are not as extensive now as dramatic as those at Siatwiinda, they demonstrate the same fundamental contradiction and vulnerability, which I shall consider in more detail below. For the present, it is enough to draw a broad division between the two kinds of schemes, a low-tech, community-based framework, represented Nkandabbwe, and the pump schemes whose expensive and complex technical and organisational infrastructures necessarily remove farmers from direct involvement in major decision making and personal control over their work and produce. The distinction is fundamental and should be borne in mind throughout the separate descriptions and analyses conditions at the the schemes.

I begin with Nkandabbwe Irrigation Scheme and them pass to consider Buleya-malima and Siatwiinda sucessively.

Nkandabbwe Irrigation Scheme

Nkandabbwe irrigation scheme is located in the escarpment hills of Sinazeze, some 23 kms from Lake Kariba. Its water source is a lake reservoir formed in the abandoned open pit of a large coal quarry, dammed to increase the water storage capacity of the quarry. Additionally, the Nkandabbwe River, which had earlier been dammed to erect a resorvoir, which drops dramatically at this, has been

diverted to empty into the coal quarry, and so channel rain waters of the escarpment into the reservoir. The water is controlled by a valve at the dam and empties into an open canal carrying the water to the plots concentrated several hundreds meters distant, below the dam.

The study of conditions at Nkandabbwe is based in part, data drawn from 3 of 9 villages associated with in order to be able to control across their situations. We selected Chiabi, situated in a river valley some 30 minutes up in the escarpment from the scheme, a sample drawn from Siamugande, with the largest proportion of scheme participants, and Siamugande, near the main tarmac road. Otherwise, the assessments are based on interviews and observations with scheme participants staff, Farmers Executive Committee officers and with people from across the entire neighbourhood, both participants and non-participants. Some data are drawn from a very useful course interviews developed and conducted by Mrs. Almut Jering, a GSDP Volunteer during 1988.

Population for the 9 villages surrounding the scheme is estimated at 2,624 souls, according to a farm-family registration report issued by the Ministry of Agriculture and Water Development in January, 1988.

Of approximately 459 families in the area, 88 have access to a .1 hectare plot at the 12 hectare scheme. Most scheme participants are primarily rain-fed farmers who rely on the scheme to provide a small cash income, relish for meals, and for domestic water supply.

Scheme participants grow primarily tomatoes and onion in their irrigated plots, from April to September. A wide variety of other crops are also grown in lesser quantities; cabbage, rape, beans, bananas, cassava, pumpkins, etc. These are generally for home consumption. In August and September, the tomatoes, onion crop has passed its peak and many farmers begin to cut their tomatoes, and to plant maize, dry season maize, which can be sold at high prices locally and in Choma.

Markets and Marketing

Plot holders and their families handle the sale or use of their produce themselves. a portion is used for home-consumption, and some is given away or sold at low prices kin or friends without plots in the form of assistances. Much is sold within the scheme to women marketeers who come from Choma to buy vegetables at low prices. Women of the associated with plot holders, wives daughters or other kin, sell part of the produce along the roadside to passing travellers.

At peak production times members of the scheme regularly booked lorries operated by VSP and GSDP to transport their vegetables to Choma, where the highest prices were obtained:- K3.07 per Kilo for tomatoes in July 1988, as opposed to K1.92 per kilo at Sinazeze. This year many hired a pick-up owned by Ward Chairman Siapwaya to transport tomatoes to market in Choma at K6.00 per box (between 15-20 kilograms). Cost of the lorries is said to be K5.00 per box. Scheme participants at Nkandabbwe value very much the fact that they are able to dispose of their produce individually without centralized marketing as at the other schemes. Though some are interested in monitoring kilograms harvested and sales, most feel they are able to do so satisfactorily on an individual basis, using their own measures and price/income estimates. Midway through the April/September vegetable season, forty irrigation farmers at Nkandabbwe estimated their sales for us. By that time, relatively early in the marketing time est, incomes ranged from between K217 to K4,000.

The average income, derived from across all farmers who estimated, was K1,572, primarily in sales of tomatoes and onions. One of the most progressive farmers at the scheme has since that time reported that he and a number of others earned more than K5,000 this year in tomato sales alone.

Scheme participants at Nkandabbwe seem to enjoy a high standard of living seen nowhere else in rural areas of Gwembe South. Much of this income is spent on clothing, equipment spares, school fees, and on essential commodities such as sugar, oil, salt and fees.

Cash income from the scheme appears to be used primarily on day-to-day purchases rather than to be invested in cattle, stock or larger purchases such as building materials as zinc roofing sheets, hinges, doors, cement, frames, etc.

Scheme participants are much differentiated from non-participants in wealth. Most Batonga in the area are able to gain considerable cash incomes from employment and/or cash-cropping cotton, or trade in fish and stock. A large portion of this income, among non-participants in the scheme goes for day-to-day expenses that participants are able to pay out of their plot-incomes. Plot holder therefore have a much larger portion of non-irrigation (i.e. rawfed cashcrop or trade) income intact for investment in major purchases or expenses.

Plotholders of the scheme village Chiabi held an average of 20.88 cattle, based on census information, whereas non-plotholders of Chiabi held an average of 3.7. Siamjеле Village with the highest proportion of plotholders, the difference is less pronounced, if extreme cases are removed : Plotholders averaged 12.68 cattle, while non-plotholders averaged 3.26 cattle per farmer.

At Siamugande, another scheme village the averages were in a similar view : 8.1 cattle for plotholders, and 3.7 for non-plotholders. Overall across the 3 villages censured the average difference between plotholder (N=44) and non-plotholders (N=37) holdings in cattle are 12.75 for plotholders, and 3.62 for non-plotholders. Similar disparities hold for goats, oxen and chickens, although non-plotholders begin to approach plot holders in possession of such small stock as chickens and goats, which involve a lesser investment. However overall, plotholders surpass non-plotholders in possession of stock, a central measure of wealth, by a very large margin.

Similarly, in terms of non-fed fields, harvests of all crops, including cash crops, are greater among plotholders than among non-plotholders.

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TABLE 2

	CHIABI VILLAGE		SIAMAJELE VILLAGE		SIAMUGANDE VILLAGE	
Crop	Plot	Non-plot	Plot	Non-plot	Plot	Non-plot
Maize	9.64	6.2	13.86	4	3.33	2.3
Sorghum	.357	.8	.84	.04	0.0	.3
Millet	.785	1.5	.9	.66	2.25	1.0
Malting Sorghum	1.2	1.25	1.4	.06	0.25	.48
Cotton	26.1 bags	12 bags	28 bags	12.8 bags	13.5 bags	10 bags

Table 2 : Harvests at Nkandabbwe, 1988.
 Measurements are in sledges, except cotton.

Plotholders held more rainfed fields on average. In Chiabi plotholders had an average of 4 rainfed fields, while non-plotholders had an average of 2.2. In Siamajele, plotholders had 3.36 fields, on average, while non-plotholders held an average of 2.73. In Siamugande, plotholders held 3.08 fields on average, while non-plotholders averaged 2.69 fields.

Similarly, in terms of rainfed harvests for the 1987-88 agricultural season, plotholders gained much larger yields from their more numerous fields (see table 2 for breakdown). Overall at Nkandabbwe average harvests of maize were 10.3 for plotholders and 4.24 for non-plotholders. Of cotton, for example average harvests were 23.75 bags per holders, and 11.6 bags per non-plotholders. It is understandable that there are more or less regular incomes from the scheme enables plotholders to invest farm-income from rainfed fields in larger purchases such as stock, that contribute to their holdings of wealth. The desparity in yields of crops, between plotholders and non-plotholders cannot be explained by this however. Men with irrigation plots have more stock. Most have long been scheme participants. In part it is likely that plotholders are more entrepreneurially minded. But on the other hand, evidence indicates that plotholders have been able to invest their more numerous cattle in bridewealth payments, and that their larger number of wives contribute labour that enables them to cultivate more extensive rainfed holdings.

The incidence of polygamy is on average, much higher for plotholders at Nkandabbwe, than for non-plotholders. Of a sample of 41 plotholder over the three villages, one was unmarried (2 %) 15 were monogamists (36 %), 25 or (60 %) had two or more wives. More plotholders, on the other hand, were monogamous : out of 31 men sampled, 24 were monogamous (77 %) while 7 nonplotholders were polygamists (22 %). Sixty percent of plotholders were polygamists at the time of the survey while only 22 % of non-plotholders had access to the additional labour that second and third wives and their children contribute to cultivation. The greatest impact in terms of this additional labour commanded by plotholders is in cash cropping for cotton. Their larger harvests of cotton make plotholders, on average, far wealthier than their non-plotholding neighbours.

4/ The ~~disparities~~ of wealth in cattle and cotton, in addition to the regular income gained from the scheme makes the plot-holders an economic elite within the local population.

The social myracts of this dramatic disparity are attenuated in some extent by the existence of extensive river garden holdings (imbeyo) cultivated in teh bed of the Nkandabbwe river for the most part, by men and women without access to the irrigation schemes. Additionally, scheme farmers generally make produce from their irrigated gardens available at very low prices, or in the form of gifts, to their neighbours without garden boils or water, taking the edge off of their envy. In diet, examined through daily records for 28 homesteads, the scheme villages, plotholders and non-plotholders are virtually indistinguistable. However, scheme participants, who form an elite do attempt to protect themselves from the envy of less fortunate neighbours and kin through charms they have purchased, to deflect the witchcraft of their neighbours. Though it was not possible to collect systematic data on the possession of charms, since few are willing to admit it, it is said by many that such protections are necessary, and common.

The scheme infrastructure at Nkandabbwe is a simple one. Water in the coal-lake reservoir are released via a valve and channel, by which they are convened to the scheme plots. Farmers wishing to water their plots open the valve at the dom to release the wa ter and open services along the carnal to conduct water to their plots. Invariably others then come to let the water into their plots, or to use the waters of the carnal for washing, bathing and for other domestic purposes.

The scheme fields are concentrated in a single 12 hectare block, which is surrounded by a line of fence to prevent entry into the scheme by animals. It is each farmer's responsibility to see that the line of fence adjacent to his or her plot is animal-proof. This is re-inforced by an F.E.C. made rule, widely accepted, that damage by animals in teh scheme is the finacial responsibility of the farmer whose section fence was penetrated. As a result, most farmers are concerned to see that their fence lines are kept in good repair.

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This rule was developed by the F.E.C. in the early 1980's and is still relied upon.

Participation in other community work, such as repair of the canals, especially the main canal, is more problematic, but likewise sanctioned by more or less strictly enforced rules.

Those who fail to participate in community work organised and called by the Farmers Executive Committee, are fined and warned the first two absences. The third time, a farmer or representative misses community party work, the plot is withdrawn. This has happened on several occasions over the past few years, and men and women generally take community work obligations seriously.

In part, this rule is also responsible for excellent community at seminars, workshops, etc., organised for the scheme by GSDP, since for the eyes of most plotholders, there is no distinction between the demands for community work and participation in workshops.

The Farmers Executive Committee

The Farmers Executive Committee at Nkandabbwe is an effective body for managing the scheme and has been so for a long time, though their efficiency and authority have been much bolstered by the great emphasis placed on their functioning role and responsibilities, by Mrs. G. Herlitz, in the course of a training programme, she developed and implemented at the three schemes.

For the duration of the training programme, the Farmers Executive Committee met once weekly to discuss issues in the organisation and activities of the scheme. Generally however, the Farmers Executive Committee, which is elected on an annual basis met, and continues to meet formally as problems require. Otherwise they meet informally to discuss scheme needs, activities, new initiatives, and the need for community involvement in these.

The scheme at Nkandabbwe was officially handed over to its Farmers Executive Committee in 1979, but has enjoyed a close relationship with GSDP advisors and other outside assistances, as with staff of the Japanese Power Nuclear Company, which was based at Nkandabbwe during the 3 year course of uranium exploration in Gwembe South.

The Ministry of Agriculture and Water Developement has posted a full-time agricultural assistant at the schemes, but he is more or less ineffective. He is rarely consulted by scheme farmers, and only infrequently involves himself in scheme affairs. His involvement, when he is involved, is often in opposition to discussions taken by members of the Farmers Executive Committee, and so his assistance is generally not welcomed by them.

The Farmers Executive Committee is essentially organised and run by its secretary Mr. Patson Mangurje. He anticipates schemes needs, acts and the primary liaison with outsiders, and organises the Farmers Executive Committee. The other members, though they may on occasion despite generally come to an agreement, a consensus, whereby the committee members then set dates and go out to their local communities to spread the information. This is usually also backed up by letters written to the various headmen, asking them to inform scheme members in their jurisdiction. The Farmers Executive Committee's demands on the community are limited, and this is one reason for their success.

It is clear to virtually all participants that the scheme has little capital, little access to major outside assistance. That on the other hand, the technology is simple, costs of maintenance are generally minimal and the work of scheme maintenance is within the competence of most participants. It is clear that work done on the scheme infrastructure is necessary for the scheme to operate, and that outside resources cannot be expected most agree it is fair that all who benefit contribute to the work of the scheme. Most therefore admit readily that the sanctions on the scheme work are fair and necessary, though a threat, should one be unable to perform the work or to find a substitute to do so.

The scheme has been handed over, though within GSDP there has been some concern that Nkandabbwe farmers would benefit from further assistance. Certainly they would.

Certainly, they would benefit, and no doubt their efficiency and economic standby could be even more improved. But the farmers Farmers Executive Committee and farmers are able to run their scheme without interference. Indeed, several members of the Farmers Executive Committee have taken the position that they do not welcome further involvement in the F.E.C. training programme, though would be interested in the possibility of specialised training for officers with more complex functions, specifically the post of Treasurer. Further they are interested to have the option of technical assistance periodically to assist them in assessing scheme infrastructure and suggesting repairs

SCheme participants would certainly benefit from continued access to GSDP/Gossner Mission transport, through bookings and the seed programme. But seeing the context of the greater community in Gwembe South.

Scheme participants at Nkandabbwe now constitutes a highly aadvantaged community. In comparison to most residents in Gwembe South, there appears to be no reaspn they cannot sustain the well-being and successful scheme operation they have achieved. It is a pleasure to reward success, but participants at Nkandabbwe are now able to manage the resources of the schemes. Without new or continued assistance beyond what is available to the broader community. Indeed, there is no indication even that an agricultural assistant seconded from M.A.W.D. is essential since the scheme has for all practical purposes, long operated without such assistance.

Farmers in the very extensive river garden complex near the scheme in the Nkandabbwe river have no special assistance available yet, they cultivate the same crops, at the sa-me time, and on an equally large scale, as at the scheme. Rules guiding community responsibilities are well institutional aged. They have technical competence to operate and maintain the scheme and even to effect major infrastructural repairs when it is recognized that these are needed. The dam wall and main canals should be checked periodically by an engineer to assess thir conditions and make recommendations, however.

More outside involvement will be a redundancy, and an unnecessary expenditure of resources better used elsewhere in Gwembe South. The awareness of a necessity from self-reliance is well-established and widespread. Organizationally and technically the scheme is well able to stand on its own.

Indeed the greatest crisis facing participants of the scheme, farmers claim again and gain are the same problems that beset those who are not able to irrigate rainfed fields are badly degraded and very scarce in the area of Nkandabbwe. Some scheme farmers have established second homesteads in the escarpment hills because of this: they move to the hills to cultivate during the rains, and return to their homesteads near the scheme only at the end of grain harvest in April/May to begin cultivation of their scheme plots. Grazing land is similarly stressed, and most animals are kept in the hills, and though they are better advantaged than most Gwembe South residents, by the relative nearness of the scheme (Make) the lack of broking boreholes or wells often requires women to walk 30 minute or more to the scheme, or to a borehole tap at Nkandabbwe School, to collect water. Even the irrigation residents rely foremost on cattle and rainfed fields. There are not sufficient arable lands in the hills nearby to sustain the irrigating population alone, so that in future years irrigators may have to choose between irrigation and rainfed farming, or, as some are doing even now, to opt for a trans-human lifestyle, fluctuating between homesteads in the distant hills, and homesteads they maintain in the area of the scheme.

Siatwiinda Pilot Irrigation Scheme

Siatwiinda Pilot Irrigation Scheme is in Mwemba Chieftancy some 18 kilometers from the tarmac road, and roughly 25 kms to Maamba. It is surrounded by five villages in its immediate vicinity; - Siapolo, Mukonko, Siavuwa, Siatwiinda and Simankawa -- though a few residents of Siabaswii and Kanchindu several kms distant also hold plots there. These few exceptions are a judicial official and chairman of the Board of Maane Consumer Cooperative, and two of Chief Mwemba's wives. A pump scheme, Siatwiinda currently operates on approximately 14 hectares, verved by four canals, and involves some 74 participants. Diesel powered pumps force water 2.2 to 2.7 kms from the lake to the canals.

The scheme was begun in 1971. Its participants have experienced a long history of outside assistance in technical inputs, planning, training and in provision of infrastructure. After several re-organizations, in the 1970's, the scheme was thought to be near readiness for handing-over until the lake level receded dramatically in the early 1980's, leaving the scheme stranded far from the school. Subsequently, the scheme was defunct between 1983 and 1986. In 1985 GSDP rehabilitated the scheme by extending the water-supply pipelines to pumping stations built at the new shoreline. The scheme began operation again in 1986 and 1987 under the assistance of Mr. David Mutinta, the scheme's long-time agricultural assistant seconded from M.A.W.D., and Dr Ingo Wittern, the scheme technical advisor, of GSDP. However, within 2 years, this minor rehabilitation by the time of Dr. Witten's departure in December 1987 the scheme was in the process of breaking down again. This time for organisational reasons.

"Transition-" Failure of the Schme, 1988

As noted in the introduction, As noted in the introduction to the scheme reports, the scheme is presently immobilized. During 1988 Siatwiinda has essentially operated at a total loss. Despite the daily availability of water farmers have grwon and sold very little produce, by the end of the vegetable season. Indeed, by the peak harvest time during September and October, the scheme had become an expensive pasture for stock.

The farmers refused to listen to, or to cooperate with their Farmers Executive Committee Officers. F.E.C. Officers were unwilling to listen to farmers' arguments regarding their role in scheme activities, resulting in constant enmity between officers of the F.E.C. and the farmers they are supposed to represent and orgnaise. Likewise the agricultural assistant now refuse to accept management responsibilities, or to take an active role in scheme activities. In large part, the organisational dead-locks breakdown of the scheme have resulted from efforts by the Farmers Executive Committee Officers to enact the lessons and responsibilities emphasized repeatedly in an F.E.C. training programme that began in September 1987. In the words of one participants, "the training programme here was a disaster."

Beginning in September 1987

Officers of the F.E.C. came under course of a specialized education on the conduct, roles and responsibilities and proper functioning of Farmers Executive Committees. Members of the F.E.C. were taught that the scheme is their own, that self-reliance is vital, and that it is the task of the F.E.C. to organise the irrigation community and manage the scheme. The necessity for self-reliance was constantly emphasized to them. By early 1988, members of the F.E.C. had taken this message to heart. They began agressively to take on scheme responsibilities, to wield authority, and to demand obedience by staff - whom they say they were taught to view as employees only. This behaviour resulted in repeated confrontation with the staff, and with farmers of the irrigation community. Within a few months, they had taken the scheme keys away from the agricultural assistant, publicly humiliated him, and alienated virtually the entire farming community, who thenceforth refused to comply with F.E.C. demands on principle alone. To comply was to submit to authority most farmers resented and felt allegitimate.

For some two months during the first half of the year F.E.C. Members struggled to take on more of the duties of management, it is said, but their organisation proved too cumbersome and ineeficient. Vital activities such as gaining access to the supply of diesel to run the pumps were disrupted when the Officer holding the keys left the area or could not be located for several days.

Schedules of water for the rainy-season rice crop collapsed under their management resulting in abandonment of the rice crop by all but 3 farmers and the re-planting of rainfed okra in the rice fields. After some two months of struggling, on their own, the F.E.C. fully returned the keys to the agricultural assistant, warning him, however, that he was an employee only and used the keys only under their authority. He accepted the keys, but has since been most reticent to take any active part in scheme affairs. Yet members of the F.E.C. continued to struggle to manage on a self-reliant manner. Without seeking assistance, they set prices for the dry season crops, but set prices far above the grainy market rate. Tomatoes for example, were priced at K3 per kilo, which at the time was twice as high as the price at Buleya-Malima, and more than K1 more than the price at Nkandabbwe. Produce prices were initially so high that marketeers who came once from Maamba, often bought once, because of the investment they had already made in transport, but resolved in future to buy from the other schemes. Presumably, the first few marketeers spread the word, because very few others risked coming, even once prices had been lowered at the end of July.

Many farmers were further disgusted when after long waiting for irish potato cuts to be supplied by the Seed Programme Officer, who is also treasurer of the F.E.C. they were told the potato cuts were not available at ZamSeed this year. in fact Irish potato had been available earlier, but the Seed Programme Officer had delayed too long in going to buy them so that they were out of stock when he arrived. By the time he informed the farmers, many decided, with frustration and anger that it was already too late to plant anything else. The failure of the Seed Programme Officer accrued to the general bad favour in which the F.E.C. was held, since he is one of the more prominent members.

These factors all contributed to the late planting, and in many cases failure to plant in the fields during 1988--despite the fact that water was pumped daily for the entire growing season.

The final, and most graphic evidence of the breakdown of cattle and goats grazing the scheme at will is also tied directly to the training programme by farmers there. Government of the Republic of Zambia allocated approximately 7,000 Kwacha in 1988 for the training of paid labour to and from work on the scheme. When, in the F.E.C. training programme, Ms Herlity, introducing the budget, came to this budgetary allocation for scheme work. She is said to have instructed F.E.C. Officers that this money was not to be used. She emphasized instead that scheme work is the work of the farmers, not of paid labourers. In this, she was presumably trying to promote the sense that the scheme, belongs to the farmers and that responsibility for its work is their. Officers of the F.E.C. took this message too, to heart. Thus when it became evident that the scheme fence lines needed repair in August, they announced that this work would be done by the farmers on a community basis. The farmers refused on the grounds that K7,000 had been allocated for such work and that it should be used to hire labour to repair the lines. Steadfastly, the F.E.C. refused to allow this.

Farmers and F.E.C. were deadlocked throughout August and September until the damage to the existing crops by animals was so extensive that farmers were no longer concerned.

Many I spoke with claimed that it did not matter if animals grazed the scheme anywa y, since the F.E.C. had already spoiled the market for their produce with its earlier unrealistic pricing. Further, in early September, several tons of tomatoes awaiting transport to Maamba were lost at the scheme, spoiled in boxes, when vehicles booked earlier through VSP and GSDP did not arrive. This too contributed to the discouragement of Siatwiinda farmers.

Water fees for the scheme remained virtually unpaid. The 23 farmers in canal A have paid an average of K9.56(21 out of 23 paid nothing), the 27 farmers on canal B have paid an average of K8.26 (25 out 27 paid nothing) and the 24 farmers on Canal C ahve paid an average of K32.70 (only 13 out of 24 paid nothing). During Septembber, the Chairman of the F.E.C. announced that water fee payment would assessed by the F.E.C., and that plots would be withdrawn from all those who had not yet paid if full. This would appear to involve all but 3 scheme participants, including most of the F.E.C. Officers themselves, unless the requirement is recinded, or farmers are

willing to pay into the scheme more money than they earned from it. The scheme bank account contains sufficient funds to pay the outstanding water fees, but it is highly unlikely that the F.E.C. will agree to such a suggestion.

1988 is said to be election year for F.E.C. Officer, though there is no talk of election being held. It is possible that election of a new F.E.C. could clear the deadlock between farmers and their management, but this is not likely. It can be expected that given these current experiences, farmers at Siatwiinda are likely to reject almost any effort from within the community to organise and manage, their activities. The burden of responsibility will undoubtedly have to rest on an outside scheme managers. For the present at least, because of jealousies and sensitivity to status and authority within the community, further conflicts and deadlocks that disrupt the functioning of the scheme will likely result from an approach that vests management authority within an F.E.C.

The present F.E.C. tried very hard to follow the guidelines taught in their training programme, but were unable to convey their dilemma to the training officer. They were therefore much bewildered and discouraged when they recognized that she blamed them for failing to mobilize the scheme.

In fact, the training programme community was an ideological template, not at all well suited to the needs and special conditions at Siatwiinda, even at its present scale. The dynamism in the relationship between the Training Officer, the F.E.C. and their community had a tragic aspect, with F.E.C. Officers caught in a contradiction between the demands of the training Officer in her vision of the role of F.E.C.'s, and the unwillingness of Siatwinda farmers to grant authority to a body they had elected as representatives. Though most F.E.C. Officers struggled to operate as she advocated, they were able to evoke only negative results. Their stance as scheme managers was not tolerated by farmers, nor were they effective in operating the scheme despite serious efforts. Their repeated failures to mobilize the community were misunderstood by the Training Officer as malfeasance and disinterest, when she compared their performance to the long self-managed scheme community at Nkandabbwe. She was demonstrative of

her displeasure that one officer confided "in the end she came to hate us, we farmers of Siatwinda."

The F.E.C. managed scheme model is incompatible with the organizational requirements of the scheme, if farmers are unwilling to surrender authority to be managed by others within their community. Jealousy of status is deeply rooted in the highly educated and elite community in the area of Siatwinda/Kanchindu. Competition for power and influence has a long history there, especially, it is said, in relation to the lineage and children of the old Siatwinda, a Muleya rain-maker and healer of great influence, tensions, suspicious, jealousies, non-cooperation certainly prevail throughout the area today. It appears that the scheme may be simply another arena in which people play out struggles and competitions for status and power that dominate in the normative social relations locally. This was not recognized by the Training Officer who assumed that a model of organization operations at Nkandabbwe could be imposed in supposedly similar conditions at Siatwinda. Even disregarding technical considerations, this is not likely.

Economics and Socio-economic Differentiation at Siatwinda

Given the failure of the scheme during 1988, production and sales figures tell us little about the economic potentialities and impacts irrigation may have on the communities it effects.

Farmers who grew vegetables planted predominantly onion, tomatoes, cabbage and rape. These were to be marketed through a central sales facility, where the produce is weighed, the price calculated, and contributions to the payment of water fees recorded. By the peak period, the 23 farmers of Canal A had recorded a total of K2,271 Kwacha for an average income of K98.77 each. However, 16 of these 23 farmers (69 %) reported no sales whatsoever. The 27 farmers of Canal B totaled sales of K1,797 for an average income of K66.58. Twenty farmers out of 27 (74 %) reported no sales. On Canal C, 24 farmers reported total sales of K10,144. This averages out to approximately K422.69 per farmer. This Canal's income was more evenly spread. Only 10 out of 24 reported no sales.

Disparities in possession of wealth and in rainfed yields

It appears that the intermittent operation of the scheme over the years has in some part attenuated the extreme economic disparities between plotholders and their non-irrigating neighbours. Census of twenty plotholders and nineteen non-plotholders reveals that plotholders surpass non-irrigators by only 1.5 times on most indicators considered, except in holding of chickens and guinea fowl, in which non-irrigators invest more.

Plotholders at Siatwinda averaged holding of 11 cattle, while non-plotholders averaged only 5.31. Plotholders possessed on average more oxen - 2.25 each, while non-plotholders averaged less than a team per farmer, 1.47. Plotholders averaged more goats : 4 goats each, while non-plotholders possessed, on average, only 2.94.

Likewise these disparities carry over into crop production on rainfed fields. Plotholders at Siatwinda, as at the other schemes, are more likely to be polygynous (43.8 % of 20) as opposed to non-plotholders (11 % of 19) so that on average they will have more labour to work their rainfed fields. Plotholders produced for example an average of 11 sledges of maize per farmer, while non-plotholders produced only 8.8 sledges each. Plotholders surpassed non-plotholders in the other grain crops - sorghum and bulls rush millet, as well, though the quantities are less large. Plotholders produced 1.8 sledges of sorghum and 4.77 sledges of millet, while non-plotholders produced only .77 sledges and 3.06 sledges, respectively.

Employment at Siatwinda does much to offset the failure of grains in rainfed fields. I counted 70 men employed in full time work, who reside in the five villages of the scheme. However, it is not likely that employment is a factor attenuating the disparities in wealth between irrigators and non-irrigators at Siatwinda, since many Siatwinda plotholders are also employed or have private businesses on the side. It is more likely that my censuses, geared to traditional indicators of wealth and well-being among Batonga, did not routinely register indicators of wealth in which Siatwinda elites currently invest. Siatwinda people among the most-highly educated and town-oriented people of Gwembe South, now invest -

i.e., in ownership of shops, taverns and investment of capital in other profitable businesses so that my survey does not reflect the very large degree of difference evidenced in the other schemes. These are likely detectable in involvement in commercial enterprises, which I did not consider.

Buleya-Malima Irrigation Scheme

Buleya-Malima Irrigation Scheme, a project of the Ministry of Rural Development, was established at the then Kariba foreshore on the mouth of the Nangombe River near Sikaputa and Sinanjola Villages approximately 20 kms from the tarmac at Sinazeze. The majority of participants were men and women resettled from their homes on the Zambezi in 1958. At the request of the Provincial Agricultural Officer, GSDP took on support of the scheme in 1979. The scheme became defunct in 1983 following a dramatic drop in the lake reservoir level that left the scheme infrastructure stranded nearly a kilometer from the lakeshore.

Present Conditions at the Scheme

In 1985, a rehabilitation was begun by the present scheme advisor Mr. Belayet Hossain. This involved the cleaning of a pump in the bed of the Nangombe River, from which to pump waters needed to rehabilitate a citrus grove, and recruitment of farmers from nearly villages of Muntuwamasiku, Siamufunde, Siamunyembe and Sikaputa, and the opening of the scheme for limited cultivation. With a grant of K1.386 million provided by the Japanese Government for scheme rehabilitation and extension, the scheme now operates on approximately 13.5 hectares, with 48 plots and 45 participating plotholders. A new permanent pumping station has been built on a small peninsular with secure access to the waters of the lake. The pumping plant uses diesel generators that provide electricity to a large electric pump on a floating pontoon in the lake that forces water into pipes, carrying them to the scheme roughly 1 km away. Presently the waters go directly into scheme Canals and farmers' fields. However, a "night reservoir" at the extreme NW of the scheme, is currently under rehabilitation, into which water will be pumped throughout the hours of darkness, to be used during the days for gravity flow irrigation in addition to direct pumping to increase the volume of water entering the scheme daily, and therefore the hectarage that can be cultivated.

Electrification is also in process, which is expected to cut the costs of pumping since electricity is thought to be less expensive than diesel.

Because of the revival of the citrus orchard as a "supporting unit" production income now supports much of the scheme's operating cost, the scheme operates on its own funds. THESE ARE MAJOR ACHIEVEMENTS. It is hoped by the scheme advisor that following several years of rehabilitation and extension that the scheme will operate on some 60 hectares and involve some 200 farm-families. This may be clearly the feasibility of any economic venture such as this depend ultimately on organisation and management. There is an expectation based in part on guidelines in Zambia's Mational Development Plans, and in part on the ideology of self-reliance in development priorities, that such schemes will be managed by the communities they serve. This, it is thought, will give such interventions an inherent viability so that they can be "handed over", ultimately, to the people assisted, freeing the assistance provider to extend its assistances to yet other communities and programmes. But there is a fundamental contradiction between this requirement and requirements for scheme feasibility in a scheme so technically and organizationally complex.

Organization and Acceptability

It is clear to all who are directly involved in the technical and organisational framework at Buleya-Malima that the high costs of operation and maintenance require a very high level of rationalization, planning and management, in order to restrict operating costs to a small percentage of farmer incomes. A higher percentange than 10 - 15 % in "water fees", to pay for the costs of operation -- it is said by the technical advisor, will not be willingly accepted by the farmer. Therefore, because the costs of providing water and infrastructure are high, so too must be the income derived by teh farmers, in order to keep their contributions to operating costs to a small percentage of income. The requirement for a highly sophisticated planning and management to ensure economic feasibility, places planning and management far beyond the skills or capacities of any in the scheme community. It is not likely that any in the scheme community will gain sufficient skills in planning, management or technical management for years to come, in the operations of the current agricultural assistant, the scheme advisor, the scheme manager, current officers of the Farmers Executive Committee, and most scheme participants I interviewed.

The scheme is presently managed by an outside staff consisting of a scheme technical advisor (provided by GSDP) a scheme manager, and an agricultural advisor, seconded to the scheme by the Ministry of Agriculture and Water Development. A Farmers Executive Committee, consisting of a Chairman, Vice Chairman, Secretary, Vice-secretary, Treasurer, Vice-treasurer, plus 2 members, is responsible for community organisation and for exercising discipline within the scheme outline to the scheme contract. "Canal Officers" extend the organisation of activities, information and discipline at the Canal level, in each of the 4 Canals.

Scheme Organisation is depicted on a chart at the scheme :-

GSDP Coordinator

Technical Advisor

Scheme Manager

Agricultural Assistant

Farmers Executive
Committees

Canal Committees

Farmers

Most participants in the scheme see the schemes as a service provided them, which is the responsibility of the Government and GSDP to organize and manage. Given their understanding of the scheme requirement in infrastructure and operation, and farmers, the current low level of sophistication in planning, horticulture, technical operation and maintenance, marketing, and input organisation, the staff at the scheme are also convinced that demands of the scheme are far beyond the capacities of a local Farmers Executive Committee or staff as well.

Scheme economic viability, given the complexity and expense of operation and maintenance, is seen to rest on a very narrow margin that increases only as farmer productivity and income can increase. The high costs of the scheme mean that it must be expertly managed. The margin of scheme profitability (not farmer) is so narrow scheme cannot afford any mistakes, might damage its economic position, and therefore result in a breakdown due to lack of capital with which to operate. Though self-managed "self-reliance" is certainly desirable, it is clear that the only form of self-reliance that may succeed is "self-reliance" by means of a hired or outside expert management staff working at the behalf of the F.E.C. However, it is also clear that such an outside staff will require a mandate to decide in most management affairs, and that an F.E.C., however, constituted will exercise budgeting power only, regarding continuing staff employment including decisions. This appears to be what both F.E.C. and scheme staff anticipate and hope for.

There is considerable confusion about the issue of "acceptability" of this form of management. Farmers and especially F.E.C. Officers have been emphatically told, in the training programme, that scheme management is their responsibility. This has been emphasized again and again, despite their view that many fundamental questions of scheme management is beyond their competence and beyond what competence they expect to achieve in future. Some, such as the Chairman and Treasurer have accepted the exhortation theory, but have little idea of, or interest in pursuing it. Most others, recognizing merely the technical complexity, organizational and marketing complexities presently, not to speak of at a later point when the scheme is extended to 200 families rather than 43, find the expectation beyond all belief and see it as unreasonable, and unrealistic. Though they hope to have more say in the running of their scheme than they do at present, most accept the notion of an outside management staff as the only possibility for continuation of the scheme even at its present scale, though complaints about lack of consultation on scheme matters are often heard.

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Farm Economics and Marketing

Based on scheme records kept by teh agricultural assistant, Buleya-Malima farmers had by mid season, earned an average of K481 per plot, up to the 30th of August. Sales at Buleya-Malima appear very low especially in comparison with earnings at the same time reported for Nkandabbwe scheme participants. 75.3 % earned under K600, while only 6 men, or 13.5 % earned over K1,000.

In part, this may be a result of under-reporting "cutting the gate" -- selling outside the schemes sales programme in order to avoid water-fees payments, and measurement of the yields. But other factors help to deprese scheme productivity -- in particular young men carefully avoid exerting themselves to produce large yields, they say, so as not to attract the jealous attention of older men, for fear of witchcarft. Further, taverns, beer, and money are plentiful in the areas so that much of the time, men are engaged with beer. Beer very much reduces the extent of male involvement with their plots so that women are left alone for much of the management and work of production. Since the plots and produce belong for the most part to their husbands, since they or their children are likely to see, but little of the cost, they may work less enthusiastically.

Essentially, the same crops are grown at Buleya-Malima as at Nkandabbwe : tomatoes, onions, cabbage and leafy vegetables such as rape, in addition to the fruits produced in the citrus grove, and small clusters of bananas grown by farmers on their own plots. Marketing is organized through a central scale, where each farmer's sales are weighed, calculated, and the sales recorded by the agricultural assistant, or his sales assistant. Marketeers, generally women from the towns at Maamba or Choma come to the scheme to buy produce from the farmers with whom they have established trade arrangements. After purchasing, they then return to town by lifts to sell the produce in urban markets at a profit. If farmers are able to organise transport to Maamba or Choma, they are able to sell their produce at a higher price, justifying the cost of transport. The scheme tractor and trailer could be booked for a trip to Maamba for K250, this year for example. Two or three

farmers might arrange a trip carrying their produce, and they split the cost of transport into shares paid by each. For the most part, sales are closely monitored, which plotholders do not like and struggle to avoid, since 50 % of all each sale is supposed to be deducted from farmers' sales until each has completed his water fee payments of K252. By mid season only 46 % of the amount required in water fee payments (K1,296) had been paid. Fifty-seven percent of farmers had paid less than half, by the beginning of September. Eleven out of 45 had paid their fees in full.

Economic Impacts of the Scheme

While organisationally and technically very different from the scheme at Nkandabbwe, it is clear that both schemes have the same effect in the formation of an economic elite..

In a survey of fifty local farmers, of twenty-five plotholders and twenty-five without plots, plotholders on average far outstripped non-plotholders selected at random from the same communities.

In stockholdings plotholders averaged 17.5 cattle per farmer, as opposed to 6.57 for non-plotholders. Plotholders held an average of 4.34 oxen per farmer, while non plotholders averaged 1.2 per farmer. In small stock such as goats, and chickens the disparities were less great, but evident. Plot holders, for example averaged holdings of 5.04 goats, and 11.26 chickens per farmer, while non-plotholders held an average of 3.8 goats and 5.42 chickens. Ducks, guinea fowl pigeons and other small stock were also more plentiful amongst plotholders.

The same dynamic between scheme-income cattle, wives and rain-fed cropping holds as at Nkandabbwe. In terms of every rainfed crops - maize, sorghum, millet, smalting sorghum and cotton, plot-holders harvested roughly two times as much as did non-plotholders.

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Conclusions on the Irrigation Schemes

The pump schemes, Buleya-Malima and Siatwinda, are fundamentally different from the gravity flow scheme in the escarpment foothills at Nkandabbwe, in terms of what inputs they for viability. Because running costs and maintenance costs are low at Nkandabbwe, farmers have freedom to experiment, to make mistakes and to learn from their mistakes, without threatening the viability of the scheme. The schemes success - or its existence -- is not put at risk by giving farmers the necessary freedom to operate on their own -- which is how they have managed to reach their high degree of organisational self-reliance and self-management. They have struggled, they have erred, they have fought, and in the process, they have managed to forge the community institutions and rules that make it possible for them, as individuals, to operate profitably.

The pump schemes do not have this advantage. Pumping costs in fuel, maintenance, oil, staff, spares are expensive and must be paid for. Capital inputs are high and the farmers who benefit, it is thought, must contribute in order to forge a commitment to the scheme and to success to ensure that they reorganize that operation costs will be their responsibilities, and finally to help defray the cost of running the scheme. The costs are high because the infrastructure is complex and involves expensive inputs. In order for the water to flow, farmers must at least ensure that the scheme can earn its operating costs -- even if these are subsidized as they are -- at Buleya-Malima by the "supporting unit" and at Siatwinda, by GSDP.

Farmers at the pump schemes cannot be allowed the learning experience of making mistakes because if they fail too many times, the water pumped at considerable expense from lake Kariba, will flow to their fields.

The scheme cannot afford that farmers fail. They are therefore guided and assisted, provided with arbitrary institutions, they are expected to adopt, without the need for these institutions and rules being graphically, painfully evident. The operation and maintenance of the schemes are complex as farmers are provided with assistants, who become themselves institutions that enable the scheme to work, without the necessity of charge in community institutions. The farmers know, especially at Siatwinda, that the massive investment of capital made so far mean that GSDP cannot, will not, let the scheme collapse. The farmers see clearly that GSDP cannot afford that the schemes fail. The schemes cannot be allowed to fail and it ~~si~~ GSDP, the farmers believe, that will ensure that they succeed. This is clearly the case, at least, as farmers see it, and it is demonstrated by the rehabilitation and extension plans, pending and in progress for the two pump schemes.

Plans at both pump schemes require for economic feasibility, i.e., to generate the funds necessary to pay running and replacement costs, (1) the number of farmers must be high, and (2) the farmers must earn high incomes from the scheme so that the portion of their incomes required in water fees will be an acceptably small percentage.

Mr Hossain, the scheme technical advisor for Buleya-Malima, for example, estimated that farmers at that scheme now earn between ~~six~~ and seven thousand Kwacha per year. He estimates that when they farm one lima in two cropping seasons annually, as his plan calls for, they will earn approximately K 12,790 per plot holder. Of this amount, his plan requires 200 farmers pay water fees of K 500 annually for K100,000. The citrus grove is expected to contribute K75,000; and hire of a scheme lorry, it is estimated, will bring in approximate K30,000. This totals some K 205,000 in assets. He estimates annual overhead expenses, after rehabilitation and extension, to be, on the other hand, roughly K167,000. This says essentially, that after rehabilitation and extension -- necessary to make the scheme economically viable -- farmers and the "supporting unit" must somehow generate at least K162,000 in order for the water to flow. This can only be accomplished through extreme rationalization of inputs, cropping and marketing. The high level of rationalization will involve exceedingly sophisticated management and a highly

compliant and cooperative community of farmers. The necessary degree of rationalization will take management of the scheme out of the hands of the farmers so that an F.E.C. can serve primarily as a legal, disciplinary and organizing body. Such plans do not consider that increasing the scale of a scheme will increase its organizational complexity dramatically, and the operation of a scheme, as we have seen in the case of Siatwinda depends upon organisation. The plans and constraints for Siatwinda are essentially similar to those I have outlined here for Buleya-Malima. I am not able to share Ms Hrlitz's assessemnt, for the pump schemes, that the problems preventing scheme self-reliance "can be overcome quite easily" through a " ... process of consciousness and training" (1988:91).

I began this conclusion with an assertion that the pump schemes are fundamentally different from the gravity flow scheme at Nkandabbwe. Yet there is one aspect in which all the schemes are similar. All of them have created small elite communities whose wealth, on average, appears to surpass the conditions of neighbours on the order of these times. To serve these, fewer than 3 % of the population of Gwembe South, GSDP has expended the bulk of its development resources, over nearly the past decade. GSDP is now in the process of re-committing themselves to another decade of this development emphasis, though they hope to raise the numbers of people served in this manner from under 3 % to nearly 5.5 %. This is surely development. But GSDP, and its participants must ask themselves if it is the kind of development they hope to foster given the overall contexts of life in Gwembe South.

The V.S.P. Depots

The valley self-help promotion Society is supposed to operate depots throughout Gwembe South for supply of basic commodities to the rural areas with the use of a lorry owned by Gossner Mission. V.S.P.'s staff provided me with a list of 18 supposedly extant depots, which I visited during September. These depots are Malima, Singola, Munyati, Siamuyala, Siamabbula Sinazongwe, Makonkoto, Mweezya, Sikaneka, Sinakoba, Sinankumbi, Muuka, Nyanga, Dengeza, Siameja, Siawaza, Kafwambila and Siampondo. I also visited Chiabi, where "a depot" operated in 1987 during famine relief which was said to be no longer extant. The depots, apart from Sinazongwe and Sinazeze, have been dormant since March, 1988, when the expatriate VSP advisor, Mrs Rawling-Brannan left the project before the expiration of her contract.

Agents, I was able to meet in all the rural areas, except Malima complained of a lack of contract with VSP administration. Villagers in all teh areas visited were highly critical of VSP for failure to supply commodities. Some, as in Siameja, offered to burn their VSP Membership cards for me complaining bitterly that they are of no value.

One VSP Officer, in the presence of the VSP Vice-coordinator, was very critical of VSP Management, He claimed that they failed to make "proper decisions" or to organise. He then clarified this by saying that they had only made a mistake this year in supporting self-help projects rather than supplying depots. He said that they had "just let the depots drop." This is indeed the case. Many of the depots are simply school classrooms, such as at Malima, Munyati, Nyanga, Siameja, Siampondo, where maize was stored during the relief programme and where the debris and spoiled maize and maize bags, tents and tarpaulins still lie. At Munyati a brickshed is under construction, but has long been waiting for roofing sheets promised by V.S.P. The bricklayer has been waiting for his pay of K300 for construction of the store, for two months. Munyati people who worked to produce the brick-ore saying angrily that they did so for nothing as are men and women in the neighbourhoods across Gwembe South who worked to construct sheds to serve as the depots, though

many of these were built as a condition for receiving famine relief maize during 1988. Those who work as agents are well-integrated in their communities, most being young men or women who were selected by local headmen or village officers to serve the community and receive a monthly salary of K100. At the time of their hiring by V.S.P. agents were promised this salary on a monthly basis regardless of sales. Most now complain of not having been paid since March, six months ago. V.S.P., on the other hand, now has a poor reputation for failure to live up to its promise and is often accused of exploiting the local people for the sake of self-aggrandizement. Antipathy of local people toward V.S.P. will affect their perception of the V.S.P. depots, which presently, do not operate. Most I spoke with were exceedingly sceptical about involvement with V.S.P. though of course they would welcome any means of buying commodities in their areas. My research focussed on the role of agents and depots. In themselves, they have good potential to serve their areas. But the failure of V.S.P. to serve these areas, and the antipathy of local people for V.S.P. needs further detailed investigation which was beyond the scope of my study of the depots.

To understand the causes of the present failure of the depots, and very common negative opinion held by villagers, an investigation of V.S.P.'s operation and management practices is called for. This should include an independent and careful study of finances and operations, recognizes that V.S.P. can certainly claim to have operated under expectations and in an inefficient manner, explain its low profitability.

The Training Programme

Following research in 1987 on the effectiveness of Farmers' Executive Committees at the three irrigation schemes, a volunteer, Ms. G. Herlitz concluded that the F.E.C.'s at all three schemes were incapable of management functions. She recommended a training programme to improve their motivation for self-reliance and their management skills, emphasizing a "participatory approach" (Herlitz 1987:91). A participatory approach, she wrote, "means that technical innovations and changes in the social system like a management set up which was not known before is done with the people the improvements are meant for in order to make them understand and learn with the development of the scheme" (ibid).

Along these lines she developed in 1987 a two-tiered training programme, at the behest of Gossner Mission, to improve 1. the management competence of the F.E.C.'s and 2. the educational level of scheme farmers in general, emphasizing "literacy", money-handling and weight / volume / price computations. These programmes were implemented after September 1987, supervised by Ms. Herlitz, by that time working under contract to Gossner Mission as a Gossner Service Team member and staff member of GSDP.

Except in the case of the F.E.C. at Nkandabwe Scheme, which gained in community and self-esteem, and improved its practical management skills, the training programme overall failed in its aims.

The Literacy Programme

At all the schemes the literacy programme, taught by hired teachers are said to have been quickly abandoned by students who found them "a waste of time" according to one of the teachers employed in the programme. By the second week of August 1988, when Ms. Herlitz left, the only literacy classes still held were taught haphazardly, at the Nkandabwe Scheme were Ms. Herlitz focused the bulk of her attention. Classes at the other schemes had already been abandoned for lack of pupils. Even at Nkandabwe, classes ceased the week of Ms. Herlitz departure. It is said that the classes were rejected by younger people as irrelevant, even at Nkandabwe, and that they were taught inappropriately to convey learning and respect to the few older people who attended.

At Siatwinda and Buleya Malima the programme was largely abandoned by students after the first few months. Those who attended initially, claimed that the curriculum, designed to accommodate a very wide range of educational backgrounds, was far too remedial. Attendance invited scorn from friends, jokes, and a loss of esteem: "if you can learn in this programme you must be really stupid", was a joke among the younger adults at Siatwinda. And so the classes were abandoned. Quite sensibly the teacher subsequently taught only by seeing that those who came to sell produce, weighed and calculated the sale themselves. She attempted only to correct them if they did not succeed. The classes at all the schemes are defunct and had no visible positive impact. Apart from employment of the teachers, and drawing attention to the connection between education and income, even in farming, the literacy programme has had little effect in bettering conditions in the already very much advanced scheme communities. The classes were seen by most we spoke with as irrelevant and unnecessary. In relation to other needs in Gwembe South they probably are.

The Farmers' Executive Committee Training Programme

The F.E.C. Training Programme implemented at the three schemes had positive impacts only at Nkandabwe. It is very likely that the basic ideas and emphases embodied in the training programme were based on Ms. Herlitz's reading of the situation at the Nkandabwe Scheme. Needs and conditions at Nkandabwe, indeed, are manageable and have long been managed under a response of self-reliance. Conditions at Nkandabwe, manageable in social and technical respects by community involvement, are also compatible with currently popular development ideologies, and these coincide with Gossner Mission's development beliefs. Self-help is also a development approach, compatible with the limited resources at Gossner Mission's disposal. Therefore the vision of a training programme that promised to make the long-dependent pump schemes self-reliant, was very attractive. Unfortunately this vision, workable at a low-cost gravity flow scheme such as Nkandabwe fails to comprehend the fundamental differences in needs, required for scheme viability at the pump schemes.

The training programme at Nkandabwe supported and reinforced an ongoing process of self-management at Nkandabwe. But the same lessons and expectations impressed upon the Farmers executive committees at the pump schemes threatened to throw the both operations into disorganization. This is what happened at Siatwinda, where no technical advisor was present to buffer the schemes from the immediate effects of the programme.

At Buleya Malima, the technical advisor, Mr. Hossain, played such a role, attenuating the impacts of the demand for self-reliance, knowing full-well this would lead to a breakdown of the scheme. His blocking of the F.E.C.'s ability to act on the training programme was a major ground for the long conflict between he and Ms. Herlitz, who insisted he was "inhibiting development". In fact, he knew that implementation of F.E.C. management as Ms. Herlitz saw it, was wholly incompatible with operational demands of the scheme. His position prevented a breakdown, but only by thwarting the F.E.C. training programme. His rejection to the programme placed F.E.C. officers in a very difficult position in which, on the one hand they were exhorted to manage the scheme by Ms. Herlitz, and on the other hand they were deprived of any avenue for doing so by Mr. Hossain.

Their response was to regard the training programme, under a veneer of seriousness, as an irrelevant game. This contributed to a lack of commitment to the training and to a lack of progress, which they hid from the serious Ms. Herlitz under a mask of confusion, as a means of excusing their failure to "develop". Ms Herlitz interpreted this failure to progress, and to struggle to act as the Nkandabwe F.E.C. officers as, in part, owing to a lack of sophistication. On the contrary, officers of the F.E.C. at Buleya-Malima are quite sophisticated: they are certainly sophisticated enough to recognize that the infrastructure at Buleya Malima is beyond their existing competence to manage, and that they stand to gain a great deal from accepting Mr. Hossain's plans, organization and management.

The officers at Siatwinda had at that time no such option. Their scheme advisor had left in December 1987 and Ms. Herlitz was assigned to assist them in his place during much of 1988. She gave full rein to the F.E.C. to organize and manage the scheme. The consequences of this have been

discussed in the section considering Siatwinda's breakdown. Not recognizing the source of troubles at Siatwinda as deriving from implementation of her theory, she instead attributed problems that began to emerge in the scheme to decisions taken by her "predecessor", Dr. Wittern. The late planting, for example, was blamed on Dr. Wittern's decision to grow rainy season rice crop. Farmers insist this was not the case. Water was not monopolized by the rice crop, they argue. They attribute the lateness instead to haphazard management of conditions by the F.E.C. who had stripped the agricultural assortment of management responsibilities.

The F.E.C. training programme could have been "a desaster" at Buleya-Malima. At Siatwinda it was.

Conclusions

This report has presented very little encouraging information regarding current conditions in Gwembe South, or on interventions undertaken to better them. Further, this report comes at a time when G.S.D.P. faces serious internal contradictions and difficulties.

Existing programmes I have examined were formulated long ago. They neither recognize nor serve current development needs. Change would be very difficult, given Gossner Mission's and G.S.D.P.'s existing commitments. Many decisions on which this report bears had already been taken, or were in the process of implementation at the time I began the research. It is doubtful therefore that this report can have much impact on the nature of development intervention in Gwembe South.

If I were to make recommendations, I would suggest that as much as possible, emphasis be shifted to wide ranging extension programmes to promote simple techniques villagers can use to ameliorate the harshness of their conditions. A reliable transport programme spanning Gwembe South on a weekly basis would go far in the short-term, to alleviate many of the immediate problems confronting Gwembe South residents. The reports of Buntzel (1981) and Scudder, Colson and Scudder (1982) should be closely examined in view of the information I have presented here. They appear to be as valid today as when they were written, with the exception of Buntzel's extensive recommendations on the organization of GSDP proper.

The people of Gwembe South are in great need of assistance if they are to forge livable conditions for themselves now and in coming years. It is to be hoped that Gossner Mission and GSDP will continue to work and to find appropriate structure.

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ADDENDUM A

Rev. Luig has subsequently asked at the conclusion of the research that we develop recommendations to be included in an annex. Unfortunately the lateness of this request makes it impossible for me to do so. This would require additional research to get and to ascertain the constraints and possibilities that will determine alternatives. It is regretable that the report could not have been initially so oriented.

J. Habarad,
Lusaka, 19 October 1988