ASSESSMENT OF THE SMALLHOLDER MARKET CREATION PROJECT: A CASE STUDY OF KABWE DISTRICT

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ASSESSMENT OF THE SMALLHOLDER MARKET CREATION PROJECT: A CASE STUDY OF KABWE DISTRICT

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

ACIAR	Australian Centre for International Agricultural Research
ASIP	Agricultural Sector Investment Program
FAO	Food and Agriculture Organization
IDE	International Development Enterprise
MACO	Ministry of Agriculture and Cooperatives
PRISM	Poverty Reduction through Irrigation and Smallholder Markets
SMC	Smallholder Market Creation

ABSTRACT

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This research report presents an assessment of the performance of the beneficiaries of the Smallholder Market Creation (SMC) Project after the conclusion of the implementation stage. The SMC project was implemented by the International Development Enterprise, Zambia office, from June 2003 to 2005. An evaluation of the project performance in December 2005 revealed that the project had achieved its objectives, some of which were increased incomes for the farmers and food self sufficiency. However, there was need to determine whether the beneficiaries still continued to reap the benefits of the project even after IDE had pulled out.

This study, therefore, intended to assess the performance of the individual farmers after the end of the implementation stage of the project. Several indicators such as types of crops grown using irrigation, size of irrigated land, constraints being faced by the farmers, organization of the farmers in the running of the project and the profitability realized from the irrigation ventures of the farmers were all used to determine the performance of the farmers. The study was conducted in Chibombo, Chankumba and Mukobeko areas of Kabwe District in Central Province, Zambia. Primary data was collected by the use of administering a structured questionnaire to 22 out o the 35 beneficiaries of the project in the area. Secondary data to be used for comparisons of gross margins was obtained from the Ministry of Agriculture and Co-operatives. The data obtained was analyzed using SPSS and MS Excel.

The findings of the study indicated that the crops grown using irrigation were tomatoes, cabbage, impwa, rape, cotton, onion, pumpkin leaves, and green pepper. The main source of the water was the well. Water supply for irrigation purposes was adequate. For instance in 2005, 54.5% of the respondents said they had water all year round and 40.9% of the respondents also said they had water for over 6 months of that year. This scenario is similar to 2006, with 72.7 % of the beneficiaries experiencing no water shortage the entire growing season. The gross margins computed for the four selected crops and 8 farmers averaged between 65 and 90%. This indicates that the activities of the farmers were profitable. The major problems or constraints that were faced by the farmers were spares for the pumps, inadequate supply of labor and lack of access to adequate fertilizer.

Key recommendations from the study are that a mechanism must be developed whereby spare parts are made available to the intended farmers, so that the efficiency of the pumps is not adversely affected. Similar future projects should also ensure that committee members are trained in order for them to be able to comprehend the new technologies acquired, so that they can transfer it to other farmers.

CHAPTER 1
INTRODUCTION

1.1 Background Information

The majority of people in the rural areas of Zambia are subsistent farmers in that they have small land holdings, typically less than two hectares. Traditionally, these farmers rely on rain fed agriculture in which they only produce once in a calendar year, while most parts of the year are gone through without any agricultural production.

Because these farmers only produce between once in a year and mostly only subsistence levels, it implies that during the periods of non-production, they lack food supplies and income to purchase basic needs, hence poverty levels are perpetuated. In some rare cases when some farmers are able to remain with surplus produce, they are unable to sell it due to poor infrastructure in rural areas.

It is in this vain that the International Development Enterprise, IDE, embarked on the Smallholder Market Creation (SMC) project, which lasted from June, 2003 to June, 2005. This project involved provision of treadle pumps on a credit basis to smallholder farmers, technological support, extension services and marketing assistance of the output produced.

The aim of the project was to enable farmers produce all year round and be able to sell their surplus and hence improve their overall livelihoods. These farmers were encouraged to produce high value crops like paprika, tomatoes, rape, okra, etc.

The goal of the SMC project was that the marketing systems generated would have the capacity to sustain themselves and expand further without the direct support of IDE interventions. It would be important to determine whether the project can be replicated in other areas.

After the project came to an end in June, 2005, IDE concluded all its activities in the areas where the SMC project was running and withdrew all its support from the beneficiaries. The farmers were left to manage the technology provided on their own.
(Mudenda, 2005).

1.2 Problem Statement

Even though over half of Zambia's land is arable and potentially irrigable, (Review of Commerce and Agriculture, 2001), currently the use of irrigation is relatively small countrywide. Although it is purported that the treadle pump has the advantage of reducing farm labor requirements by about 80% and at the same time increasing the irrigated area fourfold to an average of one lima per farmer, its been observed that the majority of small scale farmers still employ traditional methods of irrigation such as the watering can and buckets which slow productivity. Worse still, most farmers do not even produce during the dry season because of irrigation problems.

In order to improve the livelihoods of smallholder farmers, IDE in conjunction with Winrock initiated the SMC project in selected areas of Central, Southern, Copperbelt and Lusaka provinces of Zambia.

This research intends to determine whether the farmers can now manage the project and be able to improve their livelihoods even after the phasing out of the SMC project. The research also intends to see whether the farmers can even be able to improve their performance and have access to even larger markets for their produce.

1.3 Study Purpose

To assess the performance of the individual farmers after the end of the implementation stage of the Smallholder Market Creation project.

1.4 Study Objectives

The specific objectives of this study were the following;

1. To determine the types of crops grown, hectares planted and yields realized under irrigation.
2. To identify the constraints being faced by farmers after the withdrawal of support by IDE.
3. To determine the adequacy of the water supply to be used the irrigation.
4. To determine the types of markets these produce are being sold to.
5. To determine the way the beneficiaries were organized in running the project.
6. To determine the profitability of the crops planted under irrigation.

1.5 Rationale of the Study

The choice of this study has been based on the interest to have an insight in irrigation development in Zambia. The assessment of the SMC project would reveal areas that might need special consideration when designing future irrigation projects that are aimed to serve small scale farmers in particular and all farmers in general.

1.6 Study Scope

This research study is limited to the evaluation of beneficiary farmers of the Smallholder Market Creation project in Kabwe district.

1.7 Structure of the Report

The report begins with giving background information of the SMC project in Kabwe district in Chapter 1. Still in chapter 1, the study purpose and study objectives are stated. The Chapter also highlights the structure of the study, which is very important in guiding readers to specific topics of interest. Chapter 2 reviews relevant literature to the study, while chapter 3 gives a description of the methodology used in the study process and also background information of the study area, data collection and analysis procedures used in the study. Chapter 4 presents the results and findings of the study and discusses the results

found. Finally, chapter 5 offers conclusions and recommendations that are drawn from the findings of the research and also derived from the unstructured survey conducted on the respondents.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

Chapter 2 reviews literature relevant to the study of the assessment of the SMC project. Literature on the role that irrigation plays in the increase of agricultural production as well as the need to assist smallholder farmers in the development of irrigation schemes. This chapter also highlights some of the major irrigation schemes that have been implemented in Zambia since independence. There successes and failures are indicated.

2.2 The Role of Irrigation in Agricultural Production, Food Security and Poverty Reduction

Irrigation has a multi facetted role in contributing to food security, self sufficiency, food production and exports. It encompasses a wide range of interventions that enhance productivity and result into profitability for the rural farming population and the nation as a whole. For the substantial areas managed by smallholder farmers through traditional irrigation systems or water harvesting, it assists with both food production and cash crops enabling farmers and surrounding communities to benefit directly and indirectly from the crops produced. In order to achieve good returns to investment, effort must be made to change from subsistence to commercial farming. In large scale commercial farms, irrigation enables crop production for local and export markets with significant impact on the country's economy.

There is, therefore, need to expand land under irrigation while intensifying crop production. These efforts coupled with good market arrangements will result into increased profits from farm produce and thereby reducing poverty at both household and national levels.

When approached holistically with equal levels of support for all aspects, irrigation has major positive aspects at household and village levels and contributes significantly to poverty reduction

Irrigation projects also reduce the migration of people from the rural to urban areas. Government wishes to reduce the migration of rural population, especially the youth. This can only be achieved if both existing productivity in the rainy season is increased and made more reliable and if the returns to dry seasonal casual labor exceed the opportunity cost of alternative casual urban or construction employment. With the highly unpredictable rainfall patterns, the absence of irrigation for agricultural production makes intensification as a growth strategy a risk if not losing proposition.

Countries in Africa, especially sub-saharan Africa have realized that irrigation farming is well able to relieve food shortages that arise due to changing climatic conditions. The economic and social effects of irrigation have been great in the history of mankind.

Irrigation has been the most effective way of controlling climatic aridity since ancient times. Therefore, the necessary increase in food production will depend on the rate at which irrigated areas are expanded and existing irrigation systems are improved, (Korda, 1980).

Irrigation projects generally endear themselves to agriculturists because they tend to promote maximum yield per hectare- a well understood and cherished goal they also reduce risk assignable to weather, (Carruthers and Clark, 1983). Typically, irrigation projects consume large quantities of extremely scarce resources such as capital and recurrent finance as well as skilled manpower. Therefore, the concepts and methods of economic science are very relevant in weighing alternative forms of irrigation projects and alternative designs, timing, location and operating procedures, (Carruthers and Clark, 1983).

One of the factors holding back investments in irrigation, especially in Africa, has been its very high cost. Smallholder irrigation is viewed as capable of alleviating rural poverty and also offers a chance of modernizing peasant agriculture. Modernization may result in smallholder irrigation to the growth of local industries as well as to foreign currency earnings, (Manzungu, 1996). It is because of this reason that the Special Program for Food Security under FAO is intensifying its search for low cost irrigation and water control methods suitable for small farmers. Such systems are being piloted through on-farm

demonstration programs in many countries, thereby generating the practical experience on which to base the design on larger scale investment projects (FAO, 1996).

2.3 Sustainability of Irrigation Projects

A project is defined as an investment activity in which financial resources are expected to create capital assets that will yield benefits over an extended period of time,(Gittinger, 1982), this simply means that a project must be sustainable. Most irrigation projects that have been carried out in history have yielded positive results. However, the uncertainty exists on whether these results can be sustained even when the initiators of the projects have concluded their activities. Therefore, several indicators can be used to consider the sustainability of an irrigation project, among them being the dependability and the adequacy of the water supply.

The aim of the investing effort in the development and dissemination of new farm practices is to bring about rural development through technical progress. Such progress can be said to have taken place only when farmers have actually taken up the practice, (ACIAR Proceedings, 1992).

2.4 Irrigation Schemes that have been Implemented in Zambia

In the late 1960's, the Zambian government developed and managed smallholder irrigation schemes under the Projects Division of the Ministry of Rural Development.

These schemes included;

- The Ikelenge Pineapple Scheme in Northwestern province.
- The Chapula Horticultural Scheme on the Copperbelt.
- The Luapula and Eastern provinces vegetable schemes.

Most of these schemes have not performed well and some attribute this to a top- down management approach, which did not empower farmers to operate and maintain them.

Some of these irrigation schemes have collapsed, while others were not even completed at the construction stage. The government's current policy, however, is to rehabilitate or construct these schemes and then transfer the management responsibilities and maintenance to the local farmers, (FAO, 2005)

Following droughts of 1982 and 1985, together with the decline in world copper prices, the Zambian government placed more emphasis on agriculture. There was an upsurge in irrigation development and by 1991; about 46,400 hectares were under irrigation.

However, the main constraints facing irrigated agriculture have hinged upon the lack of appropriate policies and strategies. Furthermore, the government has provided sufficient resources for the enhancement of the irrigation sub sector. In the 1994 Agricultural Sector Investment Program (ASIP), one of the five (5) main objectives was 'to ensure national food security through dependable annual production of adequate supplies of basic foodstuffs,' (Policy Frame Working Paper, 1993). This objective poses a serious challenge to the irrigation sub sector. Irrigated agriculture- for which land and water resources potential are substantial- offers a viable option for increasing crop production and reducing dependency upon rainfall and thereby achieving national objectives.

The specific objectives of the irrigation sub sector in the investment program are;
-To promote economically sustainable irrigation systems among small and large scale farmers.
-To expand the area under irrigated agriculture and contribute to increased crop production.
-To create rural employment and income generation.
-To increase income s at both national and household levels, (FAO, 1999)

If the farmers run the affairs of the project, they tend to have a feeling of responsibility over what they are managing and will learn a lot from experience. It is because of the reasons cited above in favor of farmer managed irrigation projects that this assessment of the Smallholder Market Creation project is being curried out by this researcher.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

This section highlights the research methodology employed in the study. It begins by giving a background of the area in which the study was conducted, the data collection method and finally the method used in the analysis of the data and information obtained from the respondents.

3.2 Site Study

The survey was carried out in Kabwe district, which is the provincial headquarters of the central province of Zambia. The choice of Kabwe was necessitated by the fact that the evaluation carried out at the end of the implementation stage had indicated that the performance of the project was satisfactory. Therefore, this research aimed at determining whether this good performance had continued even after IDE had pulled out.

The Kabwe area had a total of 35 beneficiaries of the SMC project. The survey intended to interview the whole population of beneficiaries. However, due to several limitations a total of 22 farmer respondents were interviewed. The specific locations in which the survey was conducted were three, namely; Mukobeko, Chankumba and Chibombo.

3.3 Data Collection Methods

The target population of this study was comprised of small scale farmers, who were beneficiaries of the SMC project in Kabwe district. A structured questionnaire was administered to the respondents in the collection of primary data. Secondary data was also collected from the Ministry of Agriculture and Cooperatives, this data was the values of the expected gross margins of selected crops.

3.4 Limitations in the Data Collection Process

Not all the beneficiaries of the project were interviewed. This is due to the following reasons; two beneficiaries had relocated to Chipata, and 3 had passed away. However, the major limitation was caused by the fact that IDE had repossessed treadle pumps from the bulk of the respondents due to non payment of the loans on the acquisition of the pumps.

3.5 Data Analysis

The data collected was both qualitative and quantitative. Microsoft Excel was used to obtain the gross margins of the selected farmers. Data entry and analysis were done using the Statistically Package for Social Scientists were used. Frequency tables were generated using SPSS.

CHAPTER 4

STUDY FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter shows the results and the discussions of these results obtained from the structured interviews conducted on the SMC beneficiaries in Kabwe district.

4.2 Crops grown under Irrigation

The crops that were grown under irrigation in 2006 were tomatoes, cabbage, impwa, rape, cotton, onion, pumpkin leaves, and green pepper. Of these, rape shown to be the most preferred crop by the farmers who were beneficiaries of the SMC project. According to the table 1 below, 26.5% of the respondents had cultivated rape in 2006. The table also indicates that the farmers do not all produce the same crops at once and this can be beneficial because the supply of the produce on the market does not necessarily depress the prices.

Table 1: Type of Irrigated Crop in 2006

Crop	Number of Farmers	Percentage (%)
Tomatoes	6	17.6
Cabbage	3	8.8
Impwa	7	20.6
Rape	9	26.5
Cotton	1	2.9
Onion	4	11.8
Pumpkin Leaves	2	5.9
Green Pepper	2	5.9
Total	34	100

Source: Own Survey Data

4.3 Size of Land

According to table 2, it can be seen that the respondents all have small holdings. The highest percentage of farmers, represented by 27% of the respondents had the size of 1 hectare of land under irrigation in the 2006 season. The largest portion of land cultivated by the respondents was 2 hectares, which accounted for only 21.6% of the total respondents. The table also indicates that 3 farmers did not cultivate using irrigation in this season.

Table 2: Size of Land (in Hectares)

Hectares	Number of Farmers	Percentage (%)
0.00	3	8.1
0.25	9	24.3
0.50	6	16.2
0.75	1	2.7
1.00	10	27.0
2.00	8	21.6
Total	37	100

Source: Own Survey Data

The small size of the land devoted to irrigated crops by the respondents could be attributed to the high labor demands of the use of treadle pumps. From the findings of the research, it was also established that 90.9% of the respondents were using owned land only and not acquiring more control of land through renting for irrigation purposes.

4.4 Constraints being faced by Farmers

The constraints that the farmers cited in the management of the irrigation technology were numerous. These constraints are listed in table 3 below. The major problem that was frequently encountered by most of the farmers was the lack of spares for the smooth operation of the pumps.

Table 3: Constraints being faced by Farmers

Constraint	Number of Farmers	Percentage (%)
Spare Parts for the pumps	19	33.9
Labor	14	25
None	10	17.9
Fertilizer	9	16.1
Pesticides	3	5.4
Drought	1	1.8

Source; Own Survey Data

4.4.1 Spare Parts for the Pump

Most of the farmers interviewed by the researcher cited the problem of the wearing out of the rubber rings of the treadle pump. A total of 33.9% of the respondents indicated they had experienced problems of wearing out of the pumps. This problem was compounded by the fact that there was no local supply of the spare parts for the pumps.

The rings required to be replaced frequently. However, the IDE office in Kabwe had closed at the time of the research and farmers had no place where they could buy these rings and other spare parts. Some of the farmers had resorted to improvising and hence the efficiency of these pumps was greatly reduced.

4.4.2 Labor

A total of 25% of the respondents cited the limited supply of labor as one of the constraints they had experienced. It was observed during the data collection process that this problem could be attributed to the fact that some of the households are headed by the aged who usually live by themselves or with their young grandchildren who cannot help in the cultivation of the fields.

The households in the project area were observed that they did not employ any hired labor, but mainly rely on family labor to provide all the labor requirements. The adequacy of the labor supply is, therefore, highly correlated to the size of the household. Small families are hit the hardest. Also were the majority of the household are school going children, this implies that they only have a limited amount of time to be devoted to working in the field.

The labor problem is further compounded by the fact that the use of the treadle pump is very laborious and hence a lot of man power is required.

4.4.3 Agricultural Inputs

The lack of inputs such as fertilizer, and pesticides, was cited as a problem by 16.1% and 5.4% respectively. The issue of lack of fertilizer could be attributed to the high cost of the commodity on the market. The beneficiaries of the SMC project did not benefit from the Fertilizer Support Program that is being run by the Zambian government. The respondents do not even belong to cooperative societies where subsidized agricultural inputs such as fertilizer could be obtained.

The problem of lack of pesticides was cited by 5.4% of the total respondents interviewed in the study. This problem is prevalent due to the fact that the majority of the crops grown are of a horticultural nature. (Refer to table 1). Crops such as tomatoes are very susceptible to pathogens and therefore must be frequently sprayed to curb these pathogens.

4.4.4 Drought

The problem of drought and lack of water for irrigation was only cited by 1.8% of the respondents as a constraint they had faced during the 2006 season. This indicates that lack of water is not considered a major problem in the three areas within Kabwe where the research was conducted.

4.4.5 Farmers who had not experienced any Constraints

Table 3 above also indicates a very important category which is not a constraint in itself. This is a category of farmers who had not experienced any constraint with their irrigation activities in 2006. Such farmers are represented by a percentage of 17.9% of the total respondents interviewed. Such a relatively high proportion of the farmers with no constraints is a good indication in that these farmers can be able to utilize the resources available to them more efficiently as they are not encountering any drawbacks.

4.5 Adequacy of Water Supply

In Kabwe district where the research was conducted, the problem of water shortages is almost non existent. This is because the area is a dambo and water is available all year round except in drought years. For instance, in 2005, 54.5% of the respondents said they had water all year round and 40.9% of the respondents also said they had water for over 6 months of that year. This scenario is similar to 2006, with 72.7 % of the beneficiaries experiencing no water shortage all the round. This is shown by the two tables below.

Table 4: Water Supply 2005

Period of Time	Number of Farmers	Percentage (%)
All year round	12	54.5
Less than one month	1	4.5
More than 6 months	9	40.9

Source: Own Survey Data

Table 5: Water Supply 2006

Period of Time	Number of Farmers	Percentage (%)
All year round	16	72.7
Less than one month	1	4.5
More than 6 months	5	22.7

Source: Own Survey Data

The main water source used by the farmers for irrigation purposes is the well, except for two farmers in the Chankumba area of Kabwe district whose water source is the stream. 90.1% of the respondents indicated that they obtained their water from the wells. The problem of water shortage only occurs in drought years, such as the 2005 season. The remedy for dried up wells is to simply dig deeper and the water will emerge once again.

4.6 Type of Market

There are two main types of markets which are employed by the respondents in the selling of the yields they realize from irrigation. These are the open market, where the farmer takes his/ her produce to the local market in the area or to Soweto market in Lusaka. On- farm selling is also used where traders buy produce from the farms.

4.6.1 On- Farm

With on- farm, traders come to the farmsteads to purchase produce which they in turn sale at the market. The price quoted by the farmers at the farm is lower as compared to the market price because most of these traders buy in bulk.

4.6.2 Open Market

The open market method is where the farmers take their produce to the market themselves, either in the city or the local market. At these markets, the farmers sale their produce at a wholesale price and in bulk, although a few prefer to sale at a retail price in smaller quantities. However, they take a long time for all the stock to sale off. 93.3% of the farmers actually sale at the open markets.

From the respondents interviewed, 68.2% said the produce realized was able to sustain their families for the whole year. Only half (50%) of the respondents were able to have some surplus produce, which they were able to sale. The remaining 50% said they were not able to sale any surplus due to the following reasons; some did not produce enough to even sustain their consumption, others only produced for consumption, while others still kept their produce to use for 'food for work' purposes.

The marketing of agricultural produce in the research area of Kabwe has numerous constraints. Transportation is one of the major problems in that most of these farmers sale their produce in Lusaka at Soweto market. The farmers first have to take their produce to the roadside by means of ox- carts or bicycles, although some, but very few, would hire a van. They then board on the buses or trucks enroute to Lusaka's Soweto market. All these connections are very costly and time consuming. The other marketing problem being faced by the farmers is the low market prices for their outputs.

4.7 Organization of Beneficiaries

All the sites where the SMC project was implemented had a committee in place. However, the duties and activities performed by the committee farmers in the different sites are very

diverse. The committee members were either appointed or elected by the farmers themselves. Only 42.9% of these committee members were provided with training by the IDE staff. This implies that most of the committee members had little or no idea in organizing or running the project due to a lack of training.

The duties of the committee ranged from finding markets for the produce, organize meetings and teach farmers on good production practices. However, these committees were found to be very inactive. This can be attributed to the fact that beneficiaries are not expected to make any contributions towards the operations of the committee. Therefore, the committee members lacked an incentive to perform the duties required of them.

4.8 Profitability of the Irrigated Crops

Both primary and secondary data were used for the estimation of the gross margins. The primary data was the estimation of gross margins in the field obtained from a selected sample of 8 beneficiary farmers for 4 different crops. The secondary data are the standard gross margins expected from a lima of land and this data was obtained from the Ministry of Agriculture and Cooperatives.

Table 6: Gross Margins per Lima

Farmer	1	2	3	4	5	6	7	8	Expected GM (%)
Tomatoes	96	94	98	-6	86	88	98	70	39
Cabbage	92	68	-	97	97	98	95	-	23
Rape	85	82	78	97	96	97	75	76	-13
Onions	-	97	89	92	-	90	98	80	19

Source: Own Survey Data and MAC0, (2005)

From the table above, it can be noted that there were huge variations in that the gross margins obtained from the field are much too high compared to the standard obtained from MACO. This scenario makes comparing these two sets of data difficult. These variations could be due to the fact that gross margin estimates from MACO are estimated from general conditions. However, weather conditions prevailing in Kabwe is not representative of the general condition.

The other reason for the huge variations could be that the variable costs used to calculate the gross margins by MACO included costs such as irrigation water, oxen hire, labor costs and packaging. However, most of these costs are not incurred by the beneficiary farmers as they are not charged for the water used, they use family labor which is usually unpaid and rarely package produce before dispatch to the market.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter highlights the conclusions that can be drawn fro the results obtained from the study and also gives recommendations that may be useful in the implementation of similar future projects.

5.2 Conclusion

It can be concluded from the findings of the study that the performance of the beneficiary farmers now that IDE has withdrawn support has been satisfactory. This conclusion can be drawn from the gross margins which averaged between 65 and 90%. This shows that the production activities of these farmers are highly profitable. The results on the type of crops cultivated also show a high level of diversification, which is a sure way of combating food shortages caused by failure of a particular crop.

Water supply is available for most parts of the year. For instance, 54.5% of beneficiary farmers in 2005 and 72.9% of beneficiary farmers in 2006 had adequate water supply through out the year, while 40.9% of the respondents said they had water for over 6 months in 2004. Only 4.5% of the beneficiary farmers had water for less than a month in both 2005 and 2006. This can be attributed to the fact that these farmers were located on a high land where water tend to drain off quickly. This means that the issue of water shortage is almost non- existent.

However, all the respondent farmers (100%) cited the same problem of the lack of an IDE office in Kabwe. The regional office in Kabwe District was closed down when the project came to n end in 2005. This meant that farmers could not access the spare parts for the pumps and also lacked the technical assistance on the operations and maintenance of the treadle pumps.

The other problem that was encountered during the project was that a lot of the beneficiaries were not able to pay back the loan for the treadle pumps and hence IDE repossessed treadle pumps from such people.

The project was coordinated by a committee that was either appointed or elected by the farmers. However, only 42.9% of the committee members were provided with training by the IDE staff. This implies that most of the committee members had little or no idea in organizing or running the project due to a lack of training. This lack of training for most of the committee members could have had a negative impact on the management of the technology passed on to the farmers.

5.3 Recommendations

Going by the results of the study and other additional information gathered during interviews with the SMC beneficiaries, the following recommendations are made:

1. The committee members chosen to lead the running of activities must be trained in necessary skills such as improved production practices, marketing and other vital aspects of running an agricultural business.
2. The repayment plans on the pumps must be worked out carefully by project staff together with the farmers themselves, so that no repossessions occur.
3. Spares for the pumps should be made available to the farmers, either through the re- opening of the IDE office in Kabwe or identifying a local distributor to supply these much needed spare parts to the farmers.
4. The marketing aspect of such a project should be specifically indicated at design and/ or implementation of the project.
5. Conservation farming should be incorporated in such projects as it will increase the productivity of the land in the long run.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

SECTION A: IDENTIFICATION PANEL

No.	Questions and Filters	Coding Categories		
1	Is the respondent the Head of Household (HHH)?	Yes	1	
		No	2	
2	Name of HHH			
3	Sex of HHH	Male	1	
		Female	2	
4	Age of HHH on last birthday			
		Don't Know	888	
5	Marital status of HHH	Married, monogamous		1
		Married, Polygamous		2
		Single/Never Married		3
		Divorced		4
		Separated		5
		Widowed		6
		Other		7
6	Has HHH ever attended formal school?	Yes	1	
		No	2	
7	What is the highest level of education completed by HHH?	Lower Primary		1
		Upper Primary		2
		Junior Secondary		3
		Senior Secondary		4
		College Level		5
		University Level		6
		None		7
8	How long have you lived here?			
		Don't Know	888	
9	How many people over the age of 18 years are in your household? Include HHH and spouse(s)	Male		
		Female		
10	How many people under and including the age of 18 years are in your household?	Male		
		Female		

SECTION B: PRODUCTION PRACTICES

	Question	Last year (2005)		This year (2006)	
11	What type of crops do you grow using irrigation?	Bananas	1	Bananas	1
		Rape	2	Rape	2
		Tomatoes	3	Tomatoes	3
		Cabbage	4	Cabbage	4
		Green maize	5	Green maize	5
		Okra	6	Okra	6
		Sweet Potato leaves	7	Sweet Potato leaves	7
		Paprika	8	Paprika	8
		Maize	9	Maize	9
		Others		Others	
		Others		Others	
		Others		Others	
		Others		Others	
		Others		Others	
12	Do you own or rent the land you use for production?	Own	1	Own	1
		Rent	2	Rent	2
		Both	3	Both	3

13 What is the size of the land (in Ha) allocated to each of the crops grown?

	2002 (before SMC)	2004 (During SMC)	2006 (After SMC)
1. Bananas			
2. Rape			
3. Tomatoes			
4. Cabbage			
5. Green maize			
6. Okra			
7. Sweet Potato leaves			
8. Paprika			
9. Maize			
10. Others (specify)			
11. Other			
12. Other			
13. Other			
14. Other			
Total			

14 Which of the following **rain-fed** crops did you cultivate last season? (*In Order of importance*)

Crop code	Area cultivated last season	Who introduced	Who provided Extension services	What constraints were faced in production of this crop	Who assisted with Constraints faced

Rain-fed crop codes: 1. Hybrid Maize; 2. Local Maize; 3. Sorghum; 4. Millet; 5. Cassava; 6. Groundnuts; 7. Rice; 8. Cotton; 9.

Sunflower; 10. Tobacco; 11. Soya Beans; 12. Common/Sugar Beans; 13. Cow Peas; 14. Irish Potatoes; 15. Sweet Potatoes; 16. Cabbage; 17. Rape; 18. Impwa; 19. Paprika; 20. Onions. **(Do not read list. Indicate the number representing the type of rain-fed crop as appropriate, e.g., if Tobacco is 1st, indicate 10 in the space provided)**

15	Did your household produce **irrigated** crops THIS season?	Yes	1	
		No	2	

16 Which of the following **irrigated** crops did you cultivate **THIS** season? (*In Order of importance*)

Crop code	Area cultivated last season	Who introduced	Who provided Extension services	What constraints were faced in production of this crop	Who assisted with Constraints faced

Irrigated crop codes: 1. Tomato; 2.Cabbage; 3.Impwa; 4.Rape; 5.Paprika; 6.Garlic; 7.Lemon grass; 8.Green maize; 9.Bananas; 10.Coffee; 11.Cotton; 12.Irish potato; 13.Tobacco; 14.Flowers; 15.Onion; 16.Pumpkin Leaves; 17.Red Pepper; 18.Green Pepper; 19.Egg Plant; 20.Carrot; 21.Sugarcane . **(Do not read list. Indicate the number representing the type of rain-fed crop as appropriate, e.g., if Coffee is 1st, indicate 10 in the space provided)**

17. What was your yield/income (etc) earned in the **irrigated** crops you cultivated **THIS** season?

Crop code	Total yield	Unit used	Units sold	Cost per unit quantity	Total Units consumed before running out	Total revenue from sale	Main output market

18. What was your yield/income (etc) earned in the **irrigated** crops you cultivated in the **2004** season?

Crop code	Total yield	Unit used	Units sold	Cost per unit quantity	Total Units consumed before running out	Total revenue from sale	Main output market

19. What was your yield/income (etc) earned in the **irrigated** crops you cultivated in the **2002** season?							
Crop code	**Total yield**	**Unit used**	**Units sold**	**Cost per unit quantity**	**Total Units consumed before running out**	**Total revenue from sale**	**Main output market**

20.	Did you use any hired labour in the production of your irrigated crops?	Yes	1	
		No	2	

21.	Where do you buy your crop inputs from? How much do they cost? Why do you buy the inputs from this source?			
Crop Name	**Crop Input**	**Input Market**	**Cost of input**	**Reason for this input market**
Name of 1st most important irrigation crop	1. Seed			
	2. Fertilizer			
	3. Pesticides/Fungicides			
	4. Manure			
	5. Packaging Material			
	6. Treadle pump spares			
	7. Other farm Implements			
	Other			
	Other			
Crop Name	**Crop Input**	**Input Market**	**Cost of input**	**Reason for this input market**
Name of 2nd most important irrigation crop	1. Seed			
	2. Fertilizer			
	3. Pesticides/Fungicides			

	4. Manure			
	5. Packaging Material			
	6. Treadle pump spares			

	7. Other farm Implements			
	Other			
	Other			

Crop Name	Crop Input	Input Market	Cost of input	Reason for this input market
Name of 3rd most important irrigation crop	1. Seed			
	2. Fertilizer			
	3. Pesticides/Fungicides			
	4. Manure			
	5. Packaging Material			
	6. Treadle pump spares			
	7. Other farm Implements			
	Other			
	Other			

Crop Name	Crop Input	Input Market	Cost of input	Reason for this input market
Name of 4th most important irrigation crop	1. Seed			
	2. Fertilizer			
	3. Pesticides/Fungicides			
	4. Manure			
	5. Packaging Material			
	6. Treadle pump spares			
	7. Other farm Implements			
	Other			

	Other			
Crop Name	**Crop Input**	**Input Market**	**Cost of input**	**Reason for this input market**
Name of 5th most important irrigation crop	1. Seed			
	2. Fertilizer			
	3. Pesticides/Fungicides			
	4. Manure			
	5. Packaging Material			
	6. Treadle pump spares			
	7. Other farm Implements			
	Other			

Crop Name	**Crop Input**	**Input Market**	**Cost of input**	**Reason for this input market**
Name of 6th most important irrigation crop	1. Seed			
	2. Fertilizer			
	3. Pesticides/Fungicides			
	4. Manure			
	5. Packaging Material			
	6. Treadle pump spares			
	7. Other farm Implements			
	Other			
	Other			

	Question	**Last year (2005)**	**This year (2006)**
22.	Do you apply any fertilizers to your soils?	Yes [1] No [2]	Yes [1] No [2]
23.	Do you plant hybrid seeds or the traditional seed?	Yes [1] No [2]	Yes [1] No [2]
24.	Do you practice any crop rotation?	Yes [1] No [2]	Yes [1] No [2]
25.	Are you able to have any surplus form the yields realized for you to sell?	Yes [1] No [2]	Yes [1] No [2]

26.	Was the produce enough to sustain you and your family?	Yes No	1 2	Yes No	1 2
27.	What is the fate of your surplus?				

	Question	Last year (2005)		This year (2006)	
28.	On what basis do you obtain your inputs?	Cash Credit	1 2	Cash Credit	1 2
		Other		Other	

SECTION C: HOUSEHOLD ECONOMICS

	Question	Last year (2005)		This year (2006)	
29.	Type of toilet	Flush Toilet	1	Flush Toilet	1
		Pit Latrine (VIP)	2	Pit Latrine (VIP)	2
		Pit Latrine (Ordinary)	3	Pit Latrine (Ordinary)	3
		Bush	4	Bush	4
		Other		Other	
30.	Type of roof on house	Thatch	1	Thatch	1
		Asbestos	2	Asbestos	2
		Iron sheets	3	Iron sheets	3
		Other		Other	
31.	Average meals per day	One	1	One	1
		Two	2	Two	2
		Three	3	Three	3
		Four	4	Four	4
32.	Main source of food	Mainly produce	1	Mainly produce	1
		Mainly buy	2	Mainly buy	2
		Both	3	Both	3
33.	1st most important source of income				
	2nd most important source of income				
	3rd most important source of income				
34.	1st most important source of income: AMOUNT				
	2nd most important source of income: AMOUNT				
	3rd most important source of income: AMOUNT				
35.	Farm implements owned	Hoes		Hoes	
		Machete		Machete	
		Watering can		Watering can	
		Bucket		Bucket	
		Slasher		Slasher	
		Wheel Burrow		Wheel Burrow	
		Rake		Rake	
		Spade		Spade	

		Shovel		Shovel	
		Pitch Fork		Pitch Fork	
		Other		Other	
		Other		Other	

36. 1st most important livestock – NAME
    2nd most important livestock – NAME
    3rd most important livestock – NAME

37. 1st most important livestock – QUANTITY
    2nd most important livestock – QUANTITY
    3rd most important livestock – QUANTITY

SECTION D: IRRIGATION

	Question	Last year (2005)		This year (2006)	
38.	Are you involved in irrigation?	Yes	1	Yes	1
		No	2	No	2
39.	Do you own a treadle pump?	Yes	1	Yes	1
		No	2	No	2
40.	When did you acquire the treadle pump?	Yes	1	Yes	1
		No	2	No	2
41.	What do you use the treadle pump for?				
42.	Name the organization that introduced you to irrigation farming?				
43.	What methods do you currently use to lift water?	Bucket/Manual	1	Bucket/Manual	1
		Treadle Pump	2	Treadle Pump	2
		Diesel Pump	3	Diesel Pump	3
		Furrow	4	Furrow	4
		Petrol Pump	5	Petrol Pump	5
		Electric Pump	6	Electric Pump	6
		Other	7	Other	7
		Other	8	Other	8
44.	What methods do you currently use to apply water?	Drip	1	Drip	1
		Over head	2	Over head	2
		Surface	3	Surface	3
		Bucket/manual	4	Bucket/manual	4

	Other		Other	
	Other		Other	
45. What is your water source for the irrigation?	Well	1	Well	1
	Stream	2	Stream	2
	Dam	3	Dam	3
	River	4	River	4
	Other		Other	
46. How long does your water source sustain you after the end of the rain season?	All year round	1	All year round	1
	< One month	2	< One month	2
	01 to 03 months	3	01 to 03 months	3
	04 to 06 months	4	04 to 06 months	4
	> 06 months	5	> 06 months	5
47. What are your coping strategies for dry spells/droughts or when your water source is unable to sustain you long enough?				
48. Have you ever experienced a dry spell within the rain season?	Yes	1	Yes	1
	No	2	No	2
49. If so, how did you cope with it?				

SECTION E: ORGANIZATION AND MANAGEMENT

50. Do you have a committee in place to help you manage the project as farmers?
    a. Yes [ ] b. No [ ]

51. If your answer to question 24 is yes, how was this committee selected?
    a. Appointed by the farmers [ ]
    b. Appointed by IDE [ ]
    c. Elected by the farmers [ ]
    d. Others (specify) _____

52. Did the committee undergo any kind of skills training?
    a. Yes [ ] b. No [ ]

53. If the answer to 26 is yes, who provided this training?

    a. IDE [ ]
    b. A training institution [ ]
    c. Others [ ]

54. What are the duties of the committee members?

    a. _____

    b. _____

c. _____

55. Are they any problems you are facing as farmers in running this irrigation project?
a. Yes [ ] b. No [ ]

56. If the answer to question 29 is yes, what are these problems?

a. _____

b. _____

c. _____

57. Is the water supply adequate for irrigation purposes?
a. Yes [ ] b. No [ ]

58. Are you as an individual farmer required to make any contribution towards the running of the project?
a. Yes [ ] b. No [ ]

59. If so, what kind of contribution(s) is this?

a. _____

b. _____

c. _____

60. If the answer to question 58 is no, why is this? _____

61. Are you satisfied with the services that IDE rendered to you?
a. Yes [ ] b. No [ ]

62. Have you learnt enough to help you manage the irrigation technology on your own?
a. Yes [ ] b. No [ ]

SECTION F: LIVELIHOOD SCALE

63. Finally, considering all the questions discussed in this interview, how would you describe the situation of your household now?

Questions	2002	2004	2006
1. Are you able to meet your household needs by your own efforts?			
2. Are you making any extra for stores, savings or investments (e.g. buying livestock or other assets, improving your land)?			
3. Do you sometimes need help from your community, or from government or other agencies?			
4. Are you dependent on this help? (Could you survive without it?) (Ask only if answer to 3 above is NO, otherwise it is N/A)			

1=Yes	2=No