FIGURES

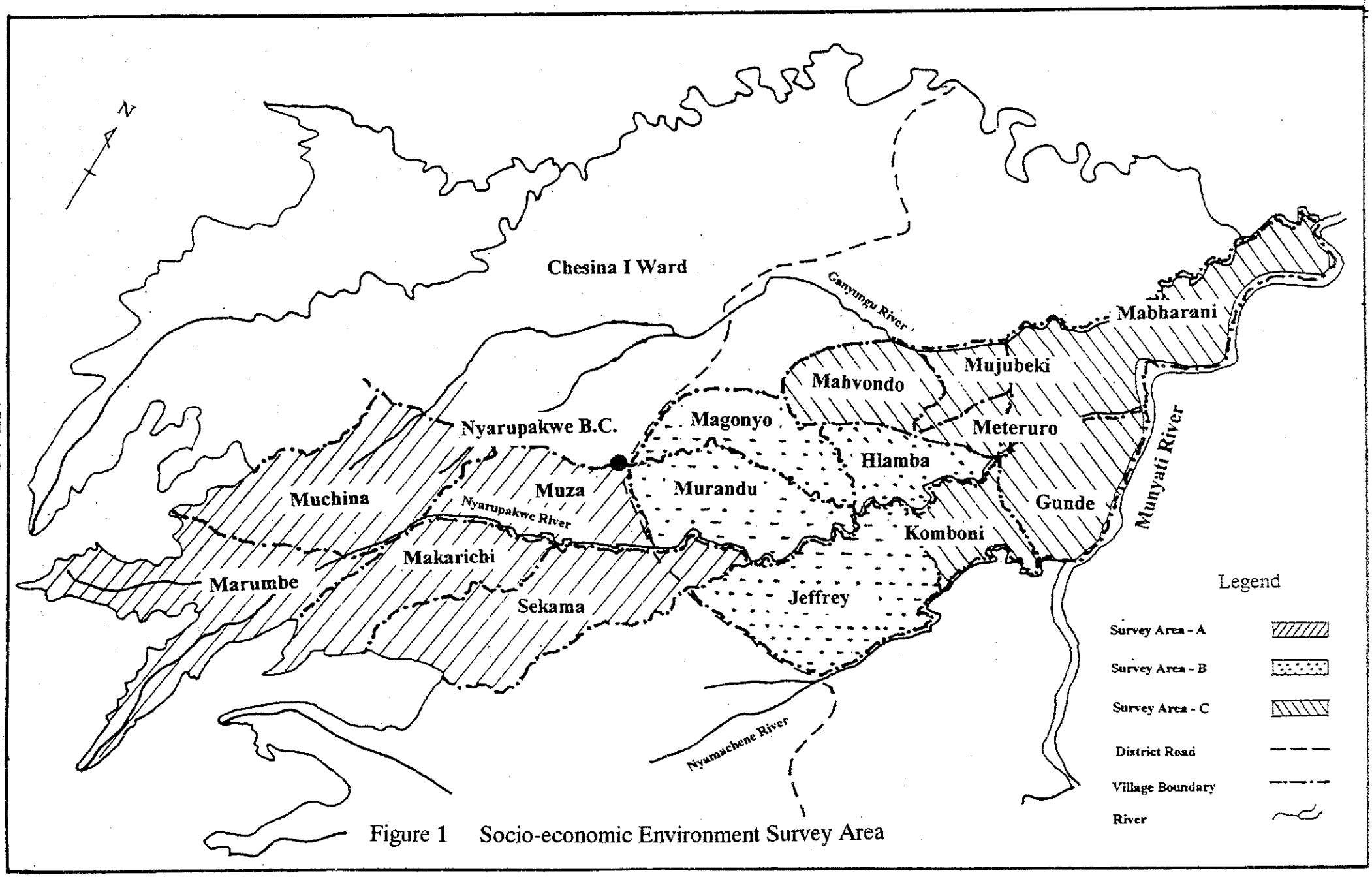

Figure 1 Socio-economic Environment Survey Area

AXL-117

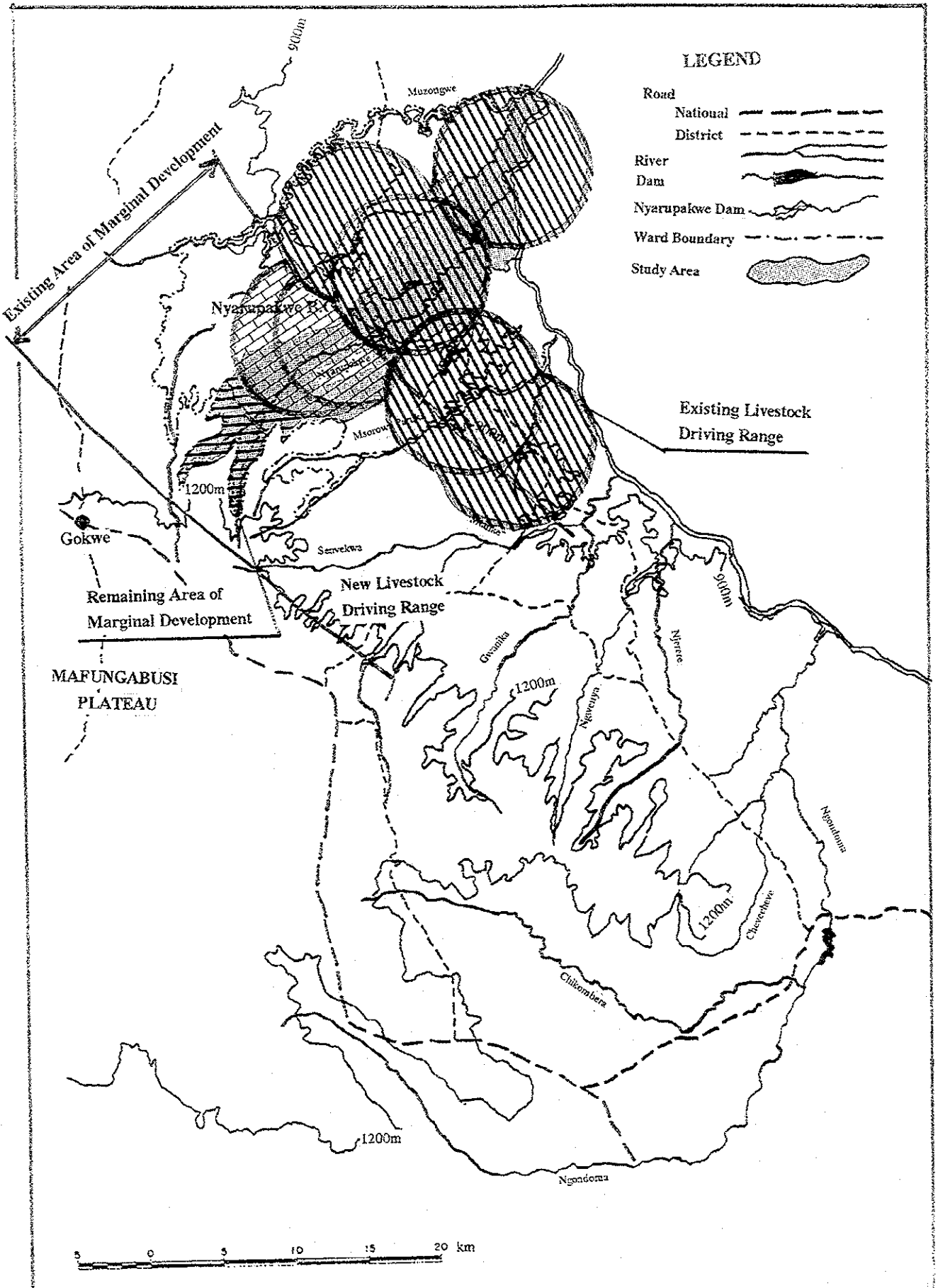

Figure 2 Spatial Analysis of Marginal Development Area

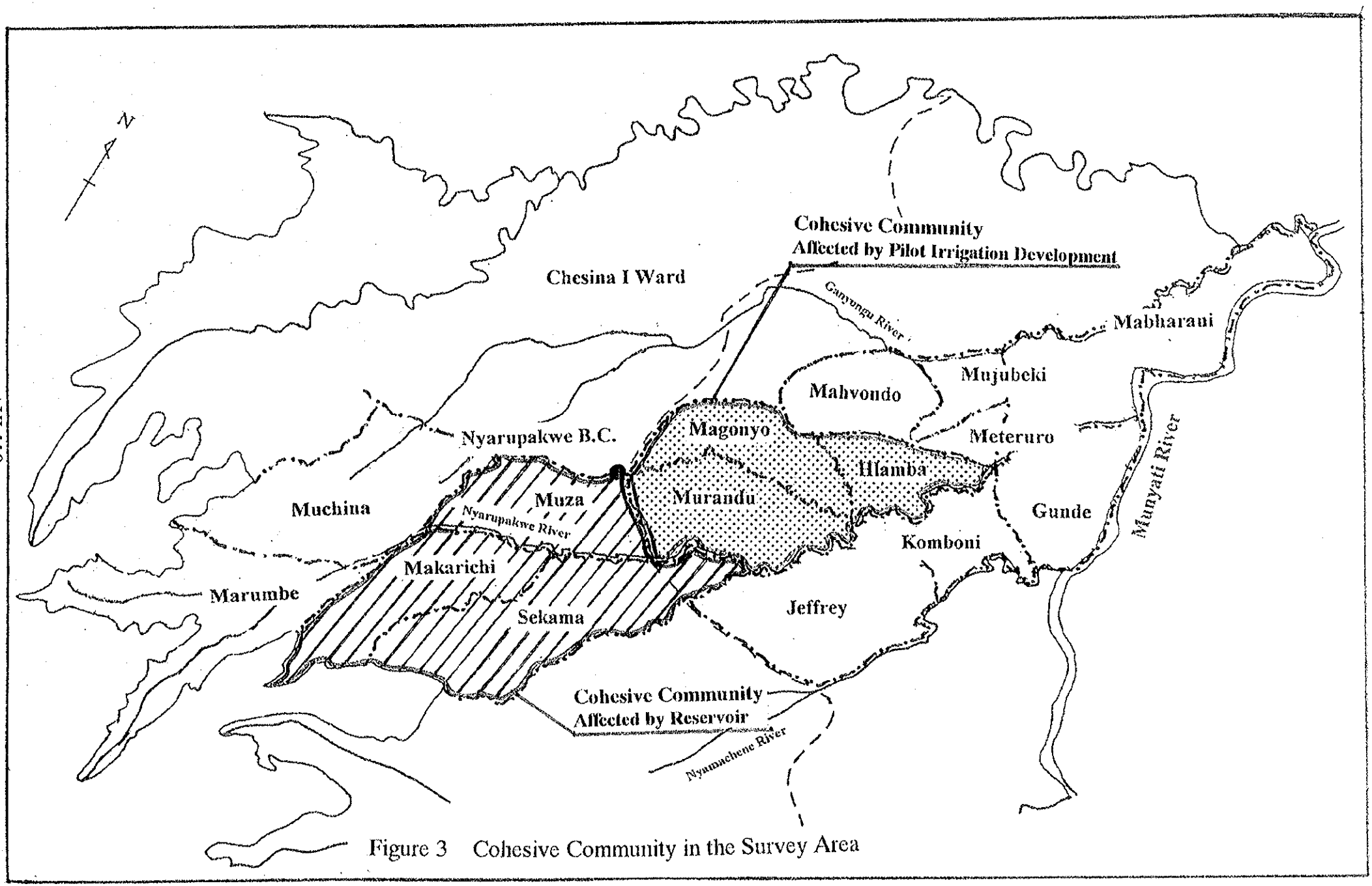

Figure 3 Cohesive Community in the Survey Area

ATTACHMENTS

Attachment 1

Guide of Participatory Survey

Guide to Participatory Survey

1. Socio-economic Survey

Baseline information refers to conditions prior to an intervention made by the project. It provides information:

- to help planners ensure that interventions respond to the needs and desires of those for whom the intervention is intended to benefit; and
- to enable evaluators to assess the impact of the intervention.

Thereby, local residents needs and desires are incorporated into the project with the endeavors of the project planners and engineering designers. For this purpose, approaches employed for preparing baseline information have been (i) Socio-economic Survey and (ii) Socio-technical Profile.

A standard socio-economic survey, which is a conventional and straightforward statistically based socio-economic survey of households produces adequate information for assessing the demand of services to be provided through the project. The result of the survey is then used to estimate the demand for the project. This is the baseline information needed to assess the benefits of the project after it is implemented.

2. Socio-technical Profile

For projects in which the participation of beneficiaries is important, procedures for preparing and analyzing baseline information known as Participatory Rural Appraisal (PRA) is employed as major tool of survey. The result would be so incorporated into project components for motivating, mobilizing, and training affected persons, families or groups population in order to participate effectively in the Pilot Project. Socio-economic profile provides information that is needed to make assessments and analysis of beneficiary needs and concerns so that appropriate interventions can be identified and suitable strategies for implementation of projects can be designed. It also provides basic information needed to evaluate the benefits of the project.

Socio-technical profile should be prepared prior to the preparation of detailed engineering designs. Because information from the profile is needed to confirm suitability of the proposed area for development, this is one of the important procedures of project design. It should therefore contain information needed to prepare the engineering designs as well as information needed to formulate the institutional development activities which should be initiated before or simultaneously with engineering design activities, or it could be carried out during the construction stage.

3. Rapid Reconnaissance Survey

3.1 Preparation of Participatory Rural Appraisal

Socio-technical profile is prepared by trained profile writers (PWs) using rapid reconnaissance survey techniques known as Participatory Rural Appraisal (PRA). It is essentially qualitative data gathering activity during the field works. Some quantitative data may be obtained from various sources such as the project office, government agencies and readily available statistical data. All information is obtained and analyzed by the appointed PWs. For analysis, semi-structured guide for information collection is used rather than using rigidly structured questionnaire. The following is a general preparatory work for rapid reconnaissance survey:

- Prepare a checklist of major topics and questions that will be the focus of the investigation. The questions will normally be open-ended because not all eventualities can be foreseen. The list and questions provide a common set of topics and questions that are to be covered by interviewers. This can be done by using a framework of simple questions such as who, where, when, what, how, for how long, how much and why;
- Prepare an implementation plan of survey;
- Make logistical arrangements for transportation, housing, etc., for the field investigation. This includes the provision of advance notice to persons in the areas where the investigation is conducted. Translator/facilitator/interpreter are identified and recruit as field assistants.

3.2 Field Investigation

Before beginning the survey, preliminary profile is compiled based on the readily available secondary information such as statistical data, direct observation and measurement, and discussions with key informants such as the local government officials, farmers, school teachers, etc. Preliminary information is also obtained from an examination of documents such as those already put out by JICA Study Team during the Phase I of the Project, or any other project report related to the Pilot Project. Information collected from these sources will help refine questions or lines of investigation for questionnaire that may be perused during interviews in order to obtain more detailed information. The following is general data collection techniques and guidelines for field investigations:

(a) Examination of the Existing Reports and Documents

The review of documents provides an initial picture of an area which can be further developed through observation. Detailed and pertinent information is often available in existing documents. Sources of information have been national and local government agencies, records and reports of the executing agency of Nyarupakwe Pilot Project, statistical office of the government, village and district records and area-specific studies that have been prepared by academics and consultants experienced to study in the pilot project area.

(b) Observation and Direct Measurement

If rapid reconnaissance survey was conducted prior to feasibility study, it is advisable to use low level reconnaissance flights depending on budget availability. If not, aerial photographs could be an inexpensive alternative. Satellite images could also be used if wide areas should be covered. For this survey, however, digital orthophoto maps covering the pilot project area are readily available at JICA Study Team's Office. Driving through the pilot project area, foot survey through the village and the pilot project area are all important observation and direct measurement for rapid reconnaissance survey in order to understand the present conditions of the pilot project area including the following:

- land and water use;
- human and animal pressure on the natural resources;
- patterns of erosion;
- agricultural crops and production including agricultural processing industries;
- local business activities;
- availability and accessibility to economic and socio-cultural infrastructure; and
- availability of consumer goods or any indicators of economic development/ progress.

(c) Key Informant Interview

For rapid reconnaissance survey, interviewing key informants is to refine clear picture of the pilot project area. Key informants are selected through preliminary information gathering period. These key informants would have a depth of knowledge of the pilot project area, its people, general economic activities and constraints as well as their history, and potentials for the Pilot Project. Key informants could be local government officials, bankers, merchants, teachers, religious or community leaders. They are able to provide perspectives of the behavior of local residents and factors which motivate their behavior. Open-ended interview with key informants is an important tool in order to highlight critical issues of the pilot project area that it further helps to examine and analyze in greater details in beneficiary interviews.

(d) Confidential Interviews to Beneficiaries

Upon completing the preliminary investigations, the survey team will have developed a refined list of questions. Answers are obtained through confidential interviews with individual beneficiaries as they are identified with assistance from key informants, or on the basis of other preliminary information. Confidential interviews should be confined to subjects on which respondents have direct experience or knowledge.

3.3 Interview Techniques

For rapid reconnaissance survey, the following general guidance is advised to adapt for a successful interviews:

(a) General Guidance to Interview Survey

- get acquainted with the contents of questions so that they can be asked in a conversational manner;
- establish a harmonious and friendly relationship with the respondent before beginning the interview;
- find a time and place to conduct the interview in order to minimize intrusions and disturbances;
- listen critically to the respondents to make sure they are adequate and relevant to the questions asked. Politely redirect the conversation back to the topic if respondent engaged in discussions not related to the topic; and
- use "probing" techniques discussed below in order to obtain complete answers to all questions. Give no answers or suggestions at all to the respondent.

(b) Probing

The quality of an interview depends a great deal on the interviewers ability to probe so as to obtain complete answers. Probe may motivate a respondent to enlarge on a previous response, to clarify or to explain the reasons for the response. Probe could also focus the discussion on the specific content of the interview so that irrelevant and unnecessary information can be eliminated.

Probing is a technique in order to elicit positive psychology of respondent as follows:

- A brief assertion of understanding and interest by nodding your head and such things as "oh", "yes", and other simple words shows the respondents that you know he/she has begun to answer the question;
- Give plenty of time of silence at this point in order to allow the respondent to gather his/her thoughts;
- Observe the respondent if the question was properly registered. Repeat the question if the respondent did not hear or appear to be misunderstand with positive attitudes;
- Repeat the respondent's reply using neutral probe questions in order to stimulate further thought by the respondent like "Why do you think so?", etc.; and
- Clearly say "I am sorry but I do not understand" when requesting clarification. Never perceive to be contradicting or "cross-examining" the answers of the respondent.

(c) Dealing with "I do not know" Responses

"I do not know" responses are common, particularly among respondents with little or no formal education. These responses can be managed by using the following techniques:

- consider "I do not know" answer can have several meanings such as:
  i. to avoid embarrassment as he/she did not understand the question;
  ii. to think the question over and want to say something to fill the silence;
  iii. to evade the question because he/she is uninformed;
  iv. to be afraid of giving a "wrong" answer;
  v. to avoid the question as it strikes him/her too personnal.
- be sensitive to the respondent's capability and shift technique to suit the situation;
- support the respondent's trust by assuring the respondent that all information will be kept in the strict confidence.

(d) Rules for Recording the Responses

A good written interview should present a picture of what the respondent said and how she or he said it. To convey such a picture, the interviewer needs to follow these rules for recording:

- Record responses during the interview. This is the most accurate way to reproduce the responses. Often, relevant information is lost and distortion occurs when the interviewer tries to remember what the respondent said and writes it up later;
- Jot down key words or phrases, using the respondent's own words. Do not summarize or paraphrase the respondent's answers. Include everything that pertains to the question;
- Hold the respondent's interest, by keeping attention focused on the respondent and not on the interview guide. A good technique to hold the respondent's interest and take verbatim notes is to start repeating what the respondent has said, as you are writing the reply; and
- Write out in detail the results of an interview soon after it has been completed. Interviews completed in the morning should be "decoded" by noontime or early afternoon. Those done in the afternoon should be written up by late afternoon or early the next morning.

4. Group Interviews and Public Hearing

4.1 Public Hearing

Public hearing is a specific form of group meeting and it can be substituted to group interviews to some extent depending on the availability and/or time constraints for interviews. Both group interviews and public hearing can provide an opportunity for discussing sensitive topics without the participants being threatened. Both of them are also useful as two-way dialogue is established. For

this purpose, the survey team is to generate initial idea with explicit statements of the objectives and interests of the executing agency of the pilot project. During this session, however, no promises should be stated as commitment. Comparing to group interviews, public hearing will provide an opportunity specifically for discussing on the topics relating to the design of pilot project. It is also held with a formal manner and prior organization of the meeting should lead it to successful conclusions.

As is shown in the "Figure 4.2.1 Schedule of Survey on the Socio-economic Environment", there are three stages of survey that need to be clarified as follows:

- Stage I Survey: Investigation of the Needs and Demands of the Local Population;
- Stage II Survey: Presentation of the Outline of Project for Clarification of the Negative and Positive Impacts; and
- Stage III Survey: Presentation of the Project Components for Agreement.

It is important to hold several times of public hearing during the first stage of survey depending on the size of local population subject to survey in order to bring out perspectives from different ideas and opinions. This is especially true if similar development project was already carried out in the near-by area as a sample topic.

During the Stage II Survey, outline of the project is presented at the public hearing in order to meet needs and demands. Participants are those who attended separate public hearing meetings held during the Stage I Survey.

Stage III Survey is a meeting to announce the result of past public hearing meetings. Detailed project components that are designed after the Stage II Survey's follow-up discussions are presented for general agreement with the local population.

4.2 Group Interviews

Group interviews are held for obtaining information on the:

- history of the pilot project area;
- changes in the natural resources and their availability;
- changes of production system and the reasons for the changes;
- variations in output and net income for different production system;
- expectations of families and perceived constraints, including gender issues; and
- socio-cultural factors that may be important in formulating the pilot project, including stratification of the community from the wealth point of view.

It is possible to hold group interviews after the public hearing or before, or at any separate time before or after the public hearing is held.

4.3 Individual Household Survey

As mentioned in the "Section 1.1.2 Socio-economic Survey", individual household interview survey is carried out as a standard socio-economic survey. This survey is a conventional and straightforward statistically based socio-economic survey of households that produces adequate quantitative information for assessing the qualitative statement obtained through a number of public hearing. It also assesses the demand of services to be provided through the project from qualitative point of views. This usually illustrates the information needed to assess the level of benefits of the project after it is implemented.

For the purpose of individual household survey, questionnaire is developed based on the PRA exercise. Wealth ranking within the survey area is also stratified during the PRA exercise as wealth ranking system is resulted from it. As a result upper class, middle class and lower class are defined. Based on the definition, households that belong to each class of wealth level are identified for interview. Selection of households subject to interview survey is made at random.

5. Socio-economic Analysis

There is no fixed method of socio-economic analysis. What it more important is to keep in mind that the analyst should handle the obtained data from the view point of how the interview result is interpreted and formulated into the design of development project and that it reflects best of the opinion and fits into the needs and demands of the local population.

As is shown in the "Figure 4.2.1 Schedule of Survey on the Socio-economic Environment", there are three stages of survey that needs to be clarified as follows:

- Stage I Survey: Investigation of the Needs and Demands of the Local Population;
- Stage II Survey: Presentation of the Outline of Project for Clarification of the Negative and Positive Impacts; and
- Stage III Survey: Presentation of the Project Components for Agreement.

Each stage of survey has its own significance in relation to socio-economic analysis. Bearing it in mind, analytical works should be conducted to meet the purposes of the survey.

6. Reporting

There is no rigid format for reporting the results of the survey. The length of the report will depend much on the amount of detail and time spent in conducting the survey. Nonetheless, an outline of the report should be prepared prior to the conduct of the survey to make sure that the report focuses on the purpose of the survey and not on interesting anecdotes that are identified during the survey.

Attachment 2

Nyarupakwe Pilot Project:

Quantitative Questionnaire for Quantitative Survey

Nyarupakwe Pilot Project:
Quantitative Questionnaire for Baseline Survey

Name of Enumerator:... ... ... Date of Interview... ... ...

Village Name:... ... ...

Household Name	
Name of Interviewee	
Position of Interviewee in the family	
Sex of Household Head	
Age of Household Head	
Total Number of household Members	
Type of marriage: monogamous polygamous (M/P)	
Number of wives	

1. Individual Household Members' description

Household Member	SEX	AGE	EDUC (Education)	FARM #1 (Farming) Y/N	OCC Main Occupation	PA #2 Present/ Absent	ORG Affiliated Organization
1	M/F					P/A	
2	M/F					P/A	
3	M/F					P/A	
4	M/F					P/A	
5	M/F					P/A	
6	M/F					P/A	
7	M/F					P/A	
8	M/F					P/A	
9	M/F					P/A	
10	M/F					P/A	
11	M/F					P/A	
12	M/F					P/A	

Note: #1: Asking whether or nor he/she engages in farming.
#2: 'P' means he/she lives in the house throughout the year
'A" means he/she lives in other places more than three months a year

Code for Education	Code for Occupation	Code for Organization
1. No formal education	1. Farmer	1. Member of ZFU
2. Drop out of primary school	2. Wage Labor(weekly paid)	2. Member of farmer's group
3. Primary school graduated	3. Salary worker(monthly paid)	3. Member of Youth Group
4. Drop out of secondary school	4. Private business	4. Member of lending Group
5. Secondary school graduated	5. Student	5. Member of religious organization (a) Saturday (b) Sunday
6. Drop out of high school	6. Pension Receiver	6. Member of women's group
7. High school graduated	7. Child (below school age)	7. Member of garden group
8. More than high school	8. No job (inclu. Housework)	8. (a)Cotpro, (b)Cotco, group member
		9. Member of other organization
		10. Non-member
		11. Member of Munyati Coop

2. Income sources of the family. *(please indicate the order of importance, 1,2,3.....)*

Source of Income	Order of Importance	Amount in Z$ Per Year
1. Selling crops incl. Cereals, cotton, fruits, etc.		
2. Selling livestock/dairy products		
3. Selling home industry products such as weaving, sewing etc.		
4. Salary from permanent job		
5. Wage from temporary jobs		
6. Pension		
8. Remittance from family		
9. Private business		
10. Others(specify)		

3. Land Holding

a. Total Area Registered/ Titled ----------ha

b. Breakdown of the area and who is registered/titled person of the area:

Land Category	Area (ha)	Registered/Titled Person (urimizita raani) Code: 1. Husband 2. Wife 3. Husband's father 4. Husband's mother 5. Wife's father 6. Wife's mother 7. Not registered/titled 8. Unknown
a. Agricultural Area		
b. Homestead		
c. Garden		

4. Water Resources

Water Source	Reliability 1. Perennial 2. Seasonal(month) 3. Timely maintained 4. Maintenance delayed 5. Not functioning	Water use 1. Drinking and domestic use 2. Fishing 3. Crop production 4. Livestock watering 5. Others(specify)
1. River		
2. Well		
3. Borehole		
4. Other (specify)		

5. Crop Cultivation Area for your farm in 1999/2000 season

Crop	Area (ha)	Tree Crop	No. of Trees
a. Maize		a. Orange	
b. Sorghum		b. Avocado	
c. Millet		c. Mango	
d. Groundnut		d. Lemon	
e. Cotton		e. Banana	
f. Sunflower		f. Others	
g. Vegetables			
h. Other Crops			
i. Fruit trees			
j. Fallow (no cultivation)			
Total Area			

6. Crop cultivation area and production *(Please answer for major 4 crops you grow)*

Name of Crops	Crop 1	Crop 2	Crop 3	Crop 4
a. Planted Area (ha)				
b. Total Production (50kg bags/bales)				
c. Production Sold (50kg bags/bales)				
d. Price at Sale (in $/kg)				
e. Production given to others (rending, exchange etc.) (50kg/bags)				
f. Home consumption (50kg/bags)				
g. Marketing Practices Code: 1. Locally (kgs) 2. Nearest growth point (kgs) 3. Nearest town (kgs) 4. Private dealers (kgs) 5. GMB (kgs) 6. Secured Contract (Y/N)				

7. Damages to your farm by the following incidence in the past 10 years

Category	Frequency (Code): 1. Only once 2. Occasionally 3. Regularly 4. None	Area Affected (on average) (ha)
a. Drought		
b. Gully erosion		
c. Sheet soil erosion		

8. Your experience in use of supporting services and your evaluation of their availability.

Service Provider	Experience Code: 1. Received the service in every year 2. Received the service 2 to 3 months in the last 5 years 3. Received the service once in the last 5 years 4. Mot received the service in the last five years.	Availability Code: 1. Easily available 2. Difficulty available
1. AGRITEX extension services		
2. Veterinary Services		
3. NGO services		
4. Munyati Cooperative Society		
5. Zunda Ramambo		
6. AFC Loan/Financial Support		
7. Cotpro		
8. Cotco		
9. Zimbabwe Farmers Union		
10. Others		

9. Please estimate your monthly cash expenditure by items.

Items	Expenditure per Year in Z$
1. Food (inc. oil, salt, sugar etc.)	
2. Clothes	
3. Education	
4. Others	
5. Total	

10. What do you see as main constraints to the development of your area?

Problem/Need	Level of importance 1. Very severe 2. Severe 3. Not severe	Possible solutions
1. Poor Roads		
2. Insufficient medicines at the clinic		
3. Poor Bridge		
4. Limited Transport for produce to Market		
5. Limited number of buses to service towns (Gokwe and Sanyati)		
6. Difficult to get produce to market		
7. Insufficient water for drinking and domestic use		
8. Insufficient water for gardening and crop production		
9. Insufficient water for livestock watering		
10. Others (specify)		

11. Assume a dam is built nearby, in what ways do you think you will get benefits?

... ...

... ...

... ...

... ...

... ...

... ...

12. How do you think the provision of dam and irrigation scheme if they alter your workload and that of your spouse?

... ...

... ...

... ...

... ...

... ...

... ...

... ...

13. Sometimes dam and irrigation developments require that some people be moved away from their current settlements or farming areas. If you happen to be the affected, will you be willing to move? If yes, explain why and state your conditions.

... ...

... ...

... ...

... ...

... ...

... ...

Attachment 3

Nyarupakwe Pilot Project:

Open-ended Questionnaire for Qualitative Survey

Nyarupakwe Pilot Project: Open-ended Questionnaire for Baseline Survey

DATE OF INTERVIEW : ....

ENUMERATOR'S NAME : ....

NAME OF VILLAGE : ....

Section 1: GENERAL INFORMATION

1.1 Name of household : ....

1.2 Name of interviewee and the position in the household : ....

1.3 Sex of household Head : ....

1.4 Occupation of household head : ....

1.5 Age of household head : ....

1.6 Place and date of birth: ....

1.7 Total No. of household members: ....

1.8 Type of marriage: Monogamous ________

Polygamous __________ No. of wives:______________

1.9 Origin of household..

....

....

....

....

Section 2: RESOURCES

2.1 Size of arable land ....

2.2 Number of cattle at household ....

2.3 Other livestock and their numbers:..

....

....

2.4 Specify agricultural equipment that the household own:..

....

....

2.5 Cotton yields in a good year ....

2.6 Maize yields in a good year ....

2.7 Cotton yields in a bad year ....

2.8 Maize yields in a bad year ....

2.9 Other resources ....

....

Section 3: OWNERSHIP AND CONTROL

3.1 What it the major occupation for making a living...

3.2 In whose name the land is registered:...

3.3 Who own which cattle: ....

....

3.4 Who own which agricultural equipment: ....

3.5 How is the agricultural produce used : ....

3.6 Who make the final decision on seeds and fertilizers to be used: ....

....

3.7 Who makes the final decision on what produce/livestock the households should sell: ....

....

3.8 How is the income used: ....

3.9 Who keeps the remaining income: ....

3.10 Who then makes the decision on how the remaining income be spent: ....

....

Section 4: DISTRIBUTION OF WORKLOAD

4.1 What five tasks are done by you in general in the household (list in order of importance)

1) ....
2) ....
3) ....
4) ....
5) ....

4.2 What five tasks are done by your spouse in general in the household (list in order of importance)

1) ....
2) ....
3) ....
4) ....
5) ....

4.3 Will the introduction of dam/irrigation project affect the above roles? Y/N

Explain ....

....

....

....

………………………………………………………………………………………

………………………………………………………………………………………

4.4 In the use of irrigation water you may be requested to pay water charges. Will it be acceptable to you? Y/N

Explain ………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

Section 5: NEED OF THE COMMUNITY

5.1 What do you consider as the main problems affecting this village and the ward?

Type of Problems:	Rank (1 to 5):
………………………………	………………………………
………………………………	………………………………
………………………………	………………………………
………………………………	………………………………
………………………………	………………………………

5.2 For has the community (of their own) tried to do to solve the above problems? (Specify for each and every one of the above stated Problems)

Type of Problems:	Solution:
………………………………	………………………………………
………………………………	………………………………………
………………………………	………………………………………
………………………………	………………………………………
………………………………	………………………………………
………………………………	………………………………………

5.3 What possible solutions to the above needs do you suggest ? (List in order of importance)

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

5.4 Name sources of water for your household and village.

………………………………………………………………………………………

………………………………………………………………………………………

5.5 For what purpose is the water used ?

………………………………………………………………………………………

………………………………………………………………………………………………

5.6 Is there any part of Nyrupakwe river that is sacred ? Yes/No

Explain ……………………………………………………………………………………

………………………………………………………………………………………………

5.7 What other things or places in the village sacred about ?

Explain ……………………………………………………………………………………

………………………………………………………………………………………………

Section 6: ASSESSMENT OF THE IMPACT OF AGRICULTURAL SUPPORT SERVICES

Service Provider	Are you aware of these services ? (Yes/No)	Availability
AGRITEX Extension Services		
Veterinary Services		
Forestry Committion		
Natural Resources Board		
Zimbabwe Farmers Union (ZFU)		
District Development Fund(DDF)		
COTTCO		
COTPRO		
AFC/AGRI-Bank		
Dairy Services		
Cotton Research Institution		
NGOs/Doners		
Others: Name of Service Provider:		

Attachment 4

Nyarupakwe Pilot Project:

Supplemental Survey Questionnaire for Baseline Survey

Supplementary Questionnaire

Name of Enumerator: ... ...

Name of Household	
Name of Respondent	
Village name	
Date of Interview	

1. Farming Inputs

Crop		Cotton	Maize	Groundnuts	Others (state)
Area planted (1998/98)					
Amount of seed used(kg)					
Fertilizers used(kgs)	Compound D				
	AN				
	Gypsum				
Other Fertilizers used (kg) (state)					
Chemicals used (state which and amount)					
Total harvest (bales/bags)					
Total sales(bales/bags)					
Name of market					
Distance to market(km)					

2. Did you hire labor for your cropping enterprise? Yes, No.

If yes, for which operations did hire labor for last year?

... ...
... ...
... ...
... ...
... ...
... ...

3. What rates did you pay for hired labor?

... ...
... ...
... ...
... ...
... ...
... ...
... ...

4. What kind of input did you use for your livestock production last year (1998/99)?

Input	Quantities	Total cost

APPENDIX – XII

COST ESTIMATE

Appendix - XII
COST ESTIMATE

Contents

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List of Figures

1 Basic Condition and Assumption for Cost Estimate

The project costs are estimated based on the following conditions and assumptions:

(1) Cost estimate was referred to the prices as of the expiration time of the Phase II Field Survey, June 2000.

(2) Unit prices of labors, construction materials and engineering works, etc., were collected from DWD and AGRITEX.

(3) Price escalation was evaluated based upon the "Consumer Price Index, 1990=100", "Civil Engineering Price Index, 1990=100" and "Building Materials Price Index, 1990=100".

(4) Construction mode is on contract basis.

(5) Conversion rate among Zimbabwe Dollars (Z$), US Dollars (US$) and Japanese Yen (¥) was assumed to be US$ 1.0 = Z$38.0 = ¥105.0.

Labor wage and unit price of construction materials which are used for cost estimate of this Project is as shown in Table 1 and 2.

2 Project Costs of Kudu Dam Irrigation Project

The Kudu dam irrigated agriculture project is comprised six components; (1) Kudu dam, (2) irrigation and drainage, (3) livestock development, (4) rural infrastructure, (5) agricultural support services, and (6) pilot project. Cost for pilot project will be explained in chapter 3. Total project cost is shown in Table 3 and the detailed explanation is made in following sections.

2.1 Kudu Dam

(1) Direct Construction Costs

The construction cost of Kudu dam was estimated through the review work of the original design and cost estimate conducted by DWD and applied updated unit price. Major items which reviewed from original design through the study were as followings;

(a) Improvement of seepage path at left bank abutment

(b) Additional excavation of dam foundation

(c) Adoption of gentle slope of dam body (upstream 1:2.6~2.8, downstream 2.0~2.3)

(d) Additional installation of sub-curtain grouting and blanket grouting

(e) Construction of service spillway to be able to release the flood discharge of 250-year return period protected by concrete.

(2) Resettlement Costs

7,800 ha area will be submerged by construction of Kudu dam, and from 370 to 720 household should be shifted to the outside Kudu dam reservoir area. Resettlement scenario is not fixed yet, but the cost was tentatively estimated as US$6,500,000 (Z$266,000,000) in total.

2.2 Irrigation and Drainage

Irrigation and drainage development is consisted of (1) main irrigation canal, (2) secondary canal, (3) canal related structures and (4) on-farm development.

(1) Main Irrigation Canal

Main irrigation canal was designed using the results of canal route survey and cross-section survey which were conducted by sub-contract in Phase-II field survey. Main irrigation canal is consisted of left main canal and right main canal. The length of left main canal and right main canal is 103.8km and 74.1km, respectively, and total length becomes 177.9km. Canal slope of main canal is designed as 1:10,000 and both main canal equipped 5.0m width of gravel-paved O&M road. Two types of canal lining are adopted for main irrigation canal, trapezoidal concrete lining type (side slope 1:1.5) is adopted for most part of the canal, and rectangular reinforced concrete type is adopted only for the steep slope area such as around the diversion structure from left main canal to right main canal. Breakdown of the construction cost is shown in Table 4.

(2) Secondary canal

Construction cost of secondary canal is estimated in accordance with following assumptions;

(a) Total length of secondary canal is 100.0km

(b) Excavation, embankment and land clearing volume is 20% of the main canal.

(c) Canal side slope is 1:1.0.

Breakdown of the construction cost is shown in Table 5.

(3) Canal Related Structures

In the Study, six types of canal related structures are considered; (a) Turn-out, (b) Siphon, (c) Aqueduct, (d) Diversion structure from Left Main Canal to Right Main Canal, (e) Bridge (box culvert) and (f) Cross drain and (g) Pump station. Breakdown of the construction cost is shown in Table 6.

(4) On-farm Development

On-farm development has 3 categories, (a) communal & resettlement area, (b) small scale commercial farm area, and (c) large scale commercial farm area.

(a) Communal & Resettlement Area

For communal and resettlement area, main and secondary canal and canal related structures are estimated above (1)~(3), and only tertiary irrigation canal and drainage system (on-firm field drainage system and link drains) and farm road are estimated in the category. Therefore, unit cost for on-firm development in communal & resettlement area is estimated as Z$ 38,000/ha.

(b) Small Scale Commercial Farm Area

As irrigation water for small scale commercial area will be conveyed by left main canal to the beginning point of the area, secondary and tertiary level development should be considered in this category. Unit cost for secondary and tertiary level development for small scale commercial area is estimated as Z$84,000/ha.

(c) Large Scale Commercial Farm Area

For large scale commercial area, conveyance system is not considered in the project, but irrigation water for the area will be stored in Kudu dam. Therefore, in addition to secondary and tertiary level development, conveyance system for the area should be considered in this category. Furthermore, as the area is located higher than design water surface level of Kudu dam, pump stations should be installed to convey irrigation water. Considering all the above, unit cost for large scale commercial area is estimated as Z$150,000/ha.

2.3 Livestock Development

Installation of 72 units of water trough along the main and secondary irrigation canal and establishment of 10 grazing blocks are planed in the project. Capacity of water trough is $3m^3$ and it is lined by concrete. Size of one grazing block is 600ha and each grazing block has 17km of fence and one trough.

2.4 Rural Infrastructures

The rural infrastructure consist of (1) improvement of 279km of rural roads, (2) construction of 101nos. and improvement of 90nos. of boreholes, and (3) Improvement of information transmission measures and construction of community center.

2.5 Agricultural Support Services

The agricultural support services are consist of (1) construction of 2 units of irrigated agriculture extension centers, and (2) strengthening program of extension services.

2.6 Cost for O&M and Replacement

O&M cost comprises labor costs, fuel expenses, material costs and administrative costs, etc., and 1.2%of the total project cost is taken as the annual O&M cost in this project. In addition, 1.0% of the total cost is evaluated in every ten years for replacement of various equipment with shorter life than the pilot project evaluation term.

3 Project Cost of Pilot Project

Pilot project is comprised six components; (1) water resources development, (2) irrigation development, (3) livestock development, (4) rural infrastructure development, (5) institutional strengthening, and (6) agricultural support services. Total cost is shown in Table 7 and the detailed explanation is made in following sections.

3.1 Water Resources Development

Water resources development is composed of (1) Nyarupakwe dam and (2) Upstream small scale dam. Nyarpakwe dam is designed as composite dam of concrete gravity dam and earth fill dam and Upstream small scale dam is designed as concrete gravity dam. Breakdown of the cost for the two dam is

shown as Table 6.

3.2 Irrigation Development

In the Project, 60ha existing cultivation area will be irrigated by water which stored in Nyarupakewe dam. Irrigation development for Pilopt Project is composed of (1) main canal (770m of pipeline and 4,880m of open canal), (2) canal related structures (10 bridges, 2 cross drains, 3 diversion structures), (3) on-farm development (field canal, field drain and farm road for 60ha). Break down of the cost is shown as Table 8.

3.3 Livestock Development

Livestock development of the Pilot Project is composed of (1) establishment of grazing area (grazing area : 860ha, 29km of fencing and 5nos. of fenced paddocks), (2) 2 water troughs (capacity : $3m^3$, concrete lined) and (3) fishery development (20ha).

3.4 Rural Infrastructure Development

Rural infrastructure development is composed of (1) road improvement (Nyarupakwe – Gokwe road : 24km and link road : total 22km), (2) improvement of rural water supply (rehabilitation : 4nos., replacement : 9nos. and construction 6nos.), (3) community center and construction 6nos.), (3) community center ($300m^2$)

3.5 Institutional Strengthening

Institutional strengthening consist of (1) construction of agricultural extension center, (2) strengthening program of AGRITEX, (3) strengthening program of VET, (4) strengthening program of local community and strengthening program of farmers' group.

3.6 Agricultural Support Services

Agriculture support services is composed of (1) strengthening program of agricultural extension services, (2) construction of open market and (3) promotion of rural credit services.

3.7 Cost for O&M and Replacement

O&M cost comprises labor costs, fuel expenses, material costs and administrative costs, etc., and 1.2%of the total project cost is taken as the annual O&M cost in this project. In addition, 1.0% of the total cost is

evaluated in every ten years for replacement of various equipment with shorter life than the pilot project evaluation term.

4 Implementation Schedule and Disbursement Schedule

4.1 Implementation Schedule

Feasibility Study will be accomplished in October 2000, and preparatory work period is considered two years, which includes detailed design, setting up of organization, arrangement of funds, tender evaluation and contract, etc., the construction work will be started from 2003. Total construction period will be eight years from 2003 to 2010. Resettlement program for the inhabitants of Kudu dam submerged area will be started two years before from the starting of construction work. The resettlement program should be prepared through the enough discussion with evacuators and appropriate countermeasures such as compensation for arable land, house, etc., should be taken in the Project.

Considering of the purpose and role of Pilot Project, it must be started to construct as far as possible, therefore, detailed design for the Pilot Project will be started from 2001 and finish the preparatory works for construction up to the middle of 2002. Following that, on July 2002, construction works of Nyarupakwe dam will be started and, as the construction period is estimated to take 18 months, all the construction works will be completed at the end of the 2003. After finishing of the construction works, strengthening program of Project related organization and agricultural extension program is still continued to 2005.

The Kudu dam will be constructed in 5 years from 2003 to 2007. Construction work of the main canals will be started one year after the starting of the Kudu dam construction work, in 2004, and be completed in 2008. Construction works for irrigation and drainage facilities at communal and resettlement areas will be started in 2007 to be finished in 2010. As for small and large scale irrigation farms, construction of irrigation and drainage facilities and also land consolidation work will be commenced in 2008 and be completed in 2010 in step with construction works of communal and resettlement area.

Water troughs for livestock will be constructed from 2004 to 2008, in accordance with construction work of main canals, because it is planed to construct along the main canal. Grazing area development will be done from

2008 to 2010. Rural infrastructure development such as improvement of rural road, rehabilitation and replacement of boreholes and improvement of rural communication are implemented from 2006 to 2008.

Agricultural support services strengthening program consist of construction of two units of agricultural extension center and implementation of extension program, construction period of agricultural extension centers are 2years from 2007 to 2008, and extension program is planed to implement 5 years from 2007 to 2011.

Implementation schedule of both Pilot Project and Kudu dam irrigated agriculture development project is shown as Figure 1.

4.2 Annual Disbursement Schedule

The annual disbursement schedule, which is worked out based on the project implementation schedule mentioned above, is shown in Table 9.

TABLES

Table 1 Labor Wage

Description	Unit	Wage (Z$)	Remarks
Common Labor	Man/day	270.00	9 hrs/day
Skilled Labor	Man/day	506.25	- ditto -
Forman	Man/day	618.78	- ditto -
Operator, heavy equipment	Man/day	618.78	- ditto -
Assistant operator, heavy equipment	Man/day	371.25	- ditto -
Operator, light equipment	Man/day	506.25	- ditto -
Assistant operator, light equipment	Man/day	371.25	- ditto -
Driver, dump	Man/day	506.25	- ditto -
Driver, other	Man/day	506.25	- ditto -
Mechanic, repair	Man/day	618.75	- ditto -
Assistant mechanic, repair	Man/day	371.25	- ditto -
Welder	Man/day	506.25	- ditto -
Electrician	Man/day	618.75	- ditto -
Carpenter	Man/day	382.50	- ditto -
Mason, skilled	Man/day	382.50	- ditto -
Mason, common	Man/day	382.50	- ditto -
Plasterer	Man/day	382.50	- ditto -
Concrete worker	Man/day	382.50	- ditto -
Steel worker	Man/day	506.25	- ditto -
Construction worker	Man/day	270.00	- ditto -

Table 2 Material Cost

Description	Unit	Price (Z$)
Cement	ton	3,300.00
Fine aggregate	m^3	746.70
Coarse aggregate	m^3	790.80
Crashed stone (50-100mm)	m^3	772.50
Crashed stone (100-200, 300-500mm	m^3	800.00
Sand	m^3	323.70
Gravel	m^3	210.00
Ready mixed concrete (1:2:4)	m^3	2,550.00
Ready mixed concrete (1:3:6)	m^3	2,550.00
Reinforcement bar	ton	2,800.00
Round bar	ton	16,920.20
Deformed bar	ton	18,286.40
L-shape steel	ton	65,000.00
Formworks, ordinary	m^2	550.00
Formworks, deform	m^2	150.00
Steal slide gate (0.3x0.4)	no.	65,000.00
Steal slide gate (0.6x0.6)	no.	292,500.00
Steal slide gate (2.0x2.0)	no.	455,000.00
Timber, plank	m^3	4,300.00
Timber, square	m^3	4,300.00
Concrete Pipe (D1,050 mm)	m	1,641.75
Concrete Pipe (D750 mm)	m	1,002.35
Concrete Pipe (D300 mm)	m	258.35
PVC Pipe (D 75mm)	m	244.50
PVC Pipe (D 50mm)	m	118.20
PVC Water stop (w=150mm)	m	420.00
Gasoline	lit.	21.86
Diesel	lit.	19.67
Engine oil	lit.	72.25

Table 3 Project Cost of Kudu dam Irrigated Agriculture Development Project

Work Item	Work Qty		Amount(x1,000Z$)	Remarks
I. Kudu Dam				
1. Stripping & Clearing	600,000	m^2	27,600	
2. Soft Excavation	2,520,600	m^3	428,502	
3. Hard Excavation	1,224,400	m^3	306,100	
4. Embankment	9,557,000	m^3	955,700	
5. Grouting	4,500	nos.	21,150	
6. Concrete	162,000	m^3	648,000	
7. Steel Work		L.S	3,020	
8. Miscellaneous			119,504	Σ(1-7)x5%
9. Engineering Services			376,436	Σ(1-8)x15%
10. Resettlement Cost		L.S	266,000	
11. Administration Expenses			157,601	Σ(1-10)x5%
12. Contingencies			330,961	Σ(1-11)x10%
Total			**3,640,574**	
II. Irrigation and Drainage				
1. Main Irrigation Canal	178	km	1,275,000	
2. Seconadary Irrigation Canal	100	km	208,000	
3. Related Structures				
(a) Diversion Structure	363	nos.	115,000	
(b) Siphon	3	nos.	118,000	
(c) Aqueduct	25	nos.	510,000	
(d) Cross Drain	317	nos.	128,000	
(e) Bridge	39	nos.	28,000	
(f) Pump Station	88	nos.	400,000	
4. On-farm Facilities				
(a) Communal & Resettlement Area	14,500	ha	551,000	
(b) Small Scale Commercial Farm	6,000	ha	504,000	
(c) Large Scale Commercial Farm	4,500	ha	675,000	
5. Engineering & Administration			676,800	Σ(1-4)x15%
6. Contingencies			518,880	Σ(1-5)x10%
Total			**5,707,680**	
III. Livestock				
1. Livestock Water Development Scheme		L.S	1,440	
2. Grazing Area Development Scheme		L.S	3,600	
3. Contingencies			504	Σ(1-2)x10%
Total			**5,544**	
IV. Rural Infrastructure				
1. Road Improvement	279	km	106,020	
2. Construction and Improvement of Boreholies	191	nos.	110,960	
3. Improvement of Information Transmission Measures		L.S	9,120	
4. Engineering & Administration			33,915	Σ(1-3)x15%
5. Contingencies			26,002	Σ(1-4)x10%
Total			**286,017**	
V. Agricultural Support Services				
1. Agricultural Extension Center	2	unit	11,020	
2. Extension Services		L.S	10,777	
Total			**21,797**	
VI. Pilot Project				
1. Water Resources Development		L.S	118,862	
2. Irrigation Development		L.S	11,310	
3. Livestock Development		L.S	675	
4. Rural Infrastruture Development		L.S	63,650	
5. Institutional Strengthening			7,374	
5. Agricultural Support Services		L.S	1,807	
6. Engineering & Administration			30,552	Σ(1-5)x15%
7. Contingencies			23,423	Σ(1-6)x10%
Total			**257,653**	
Grand Total			**9,919,264**	

Table 4 Cost for Main Irrigation Canals

Work Item	Work Q'ty		Amount (Z$ 1,000)
Land Clearing	4,315,000	m^2	47,465
Excavation (Soil)	4,846,000	m^3	339,220
Excavation (Soft Rock)	308,000	m^3	43,120
Embankment	2,658,000	m^3	207,324
Plane Concrete	15,600	m^3	39,780
Reinforced Concrete	116,900	m^3	447,727
Water Stop	130,600	m^2	80,972
Form Work	59,000	m^2	32,450
Sub-total			1,238,058
Miscellaneous (3%of sub-total)			37,142
Total			1,275,200
Round			**1,275,000**

Table 5 Cost for Secondary Irrigation Canals

Work Item	Work Q'ty		Ammount (Z$ 1,000)
Land Clearing	863,000	m^2	9,493
Excavation (Soil)	969,200	m^3	67,844
Embankment	531,600	m^3	41,465
Plane Concrete	31,000	m^3	79,050
Water Stop	3,910	m^2	2,424
Form Work	2,690	m^2	1,480
Sub-total			201,756
Missoluce (3%of sub-total)			6,053
Total			207,808
Round			**208,000**

Table 6 Cost for Canal Related Structures (1/2)

Work Item	Work Q'ty		Ammount (Z$ 1,000)
(a) Turn-out			
Reinforced Concrete	7,800	m^3	29,874
Plane Concrete	9,900	m^3	25,245
Form Work	8,050	m^2	4,428
Concrete Pipe	320	m	454
Sand Foundation	320	m^3	192
Water Stop	13,350	m^2	8,277
Gate	177	nos.	37,391
Sub-total			105,861
Missoluce (5%of sub-total)			5,293
Total			111,154
Round			**111,000**
(b) Siphon			
Reinforced Concrete	9,300	m^3	33,945
Gate	9	nos.	4,095
Excavation (Soil)	184,000	m^3	12,880
Embankment	162,500	m^3	12,675
Backfill	169,000	m^3	11,830
Form Work	58,800	m^2	32,340
Water Stop	2,200	m^2	1,364
Sand Foundation	5,000	m^3	3,000
Sub-total			112,129
Missoluce (5%of sub-total)			5,606
Total			117,735
Round			**118,000**
(c) Aqueduct			
Concrete	96,000	m^3	244,800
Reinforcement Bar	7,500	ton	137,250
Gate	96	nos.	43,680
Water Stop	35,300	m^2	21,886
Form Work	69,000	m^2	37,950
Sub-total			485,566
Missoluce (5%of sub-total)			24,278
Total			509,844
Round			**510,000**
(d) Diversion Structure from Left Main Canal to Right Main Canal			
Reinforced Concrete	510	m^3	1,953
Plane Concrete	75	m^3	191
Gate	4	nos.	1,820
Water Stop	85	m^2	53
Form Work	350	m^2	193
Sub-total			4,210
Missoluce (5%of sub-total)			210
Total			4,420
Round			**4,000**

(to be continued)

Table 6 Cost for Canal Related Structures (2/2)

(e) Box Culvert (Bridge)			
Reinforced Concrete	2,340	m^3	8,962
Plane Concrete	2,000	m^3	5,100
Water Stop	520	m^2	322
Form Work	2,200	m^2	1,210
Sub-total for Main Canal			15,595
Box Culvert for Secondary Canal			10,916
Sub-total for Secondary Canal			26,511
Missoluce (5%of sub-total)			1,326
Total			27,836
Round			**28,000**
(f) Cross Drain			
Reinforced Concrete	19,800	m^3	75,834
Plane Concrete	5,400	m^3	13,770
Form Work	21,600	m^2	11,880
Concrete Pipe	9,700	m	13,774
Water Stop	8,100	m^2	5,022
Sand Foundation	5,400	m^3	1,836
Sub-total			122,116
Missoluce (5%of sub-total)			6,106
Total			128,222
Round			**128,000**
(g) Pump Station			
Reinforced Concrete	14,200	m^3	54,386
Plane Concrete	23,450	m^3	59,798
Land Clearing	#REF!	m^2	8,354
Excavation	#REF!	m^3	59,703
Embankment	#REF!	m^3	36,489
PVC Pipe D=150mm	264,000	m	95,040
Form Work	17,800	m^2	9,790
Water Stop	10,000	m	6,200
Pump (0.050ton/sec)	160	nos.	11,584
Pump (0.013ton/sec)	200	nos.	9,400
Building Work	2,640	m^2	30,360
Sub-total			381,103
Missoluce (5%of sub-total)			19,055
Total			400,158
Round			**400,000**
Ground Total			**1,299,000**

Table 7 Project Cost of Pilot Project

Work Item	Work Q'ty		Amount(1,000Z$)	Remarks
I. Water Resources Development				
1. Nyarupakwe Dam				
(a) Excavation	145,700	m^3	14,570	
(b) Embankment	87,500	m^3	8,050	
(c) Concrete	29,500	m^3	75,225	
(d) Form	5,900	m^2	3,245	
(e) Steel Bar	200	ton	4,000	
(f) Others		L.S	10,509	Σ(a-e)x10%
2. Small Scale Dam				
(a) Excavation	1,100	m^3	110	
(b) Concrete	1,120	m^3	2,856	
(c) Others		L.S	297	Σ(a-b)x10%
(Sub-total)			(118,862)	
II. Irrigation Development				
1. Main Irrigation Canal System				
(a) Excavation	17,300	m^3	1,211	
(b) Embankment	2,400	m^3	187	
(c) Concrete	800	m^3	3,104	
(d) Concrete Pipe	850	m	1,207	
(e) Form	1,710	m^2	941	
(e) Water Stop	2,300	m	1,426	
(f) Gate	4	nos.	1,170	
(g) Others		L.S	925	Σ(a-f)x10%
2. On-farm Facilities	60	ha	1,140	
(Sub-total)			(11,310)	
III. Livestock Development				
1. Grazing Area Development Scheme	860	ha	580	
2. Livestock Water Development Scheme	2	unit	40	
3. Fishery Development Scheme		L.S	55	
(Sub-total)			(675)	
IV. Rural Infrastructure Development				
1. Nyarupakwe-Gokwe Road Improvement	24	km	36,480	
2. Link Roads Improvement	22	km	8,360	
3. Improvement of Boreholes	4	nos.	1,520	
4. Construction of Boreholes	15	nos.	11,400	
5. Construction of Community Center		L.S	5,890	
(Sub-total)			(63,650)	
V. Institutional Strenghening				
1. Agricultural Extension Center	1	unit	3,800	
2. Institutional Strengthening Program		L.S	3,574	
(Sub-total)			(7,374)	
VI. Agricultural Support Services				
1. Agricultural Extension Services		L.S	1,047	
2. Development of Open Market	1	unit	760	
(Sub-total)			(1,807)	
VI. Engineering Services			(30,552)	Σ(I-VI)x15%
VII. Contingencies			(23,423)	Σ(I-VII)x10%
Grand Total			**257,653**	

Table 8 Cost for Main Irrigation Canal and Related Structures

Work Item	Work Q'ty		Amount (Z$ 1,000)
Excavation	17,300	m^3	1,211
Embankment	2,400	m^3	187
Reinforced Concrete	800	m^3	3,104
Concrete Pipe	850	m	1,207
Water Stop	2,300	m	1,426
From Work	1,710	m^2	940
Gate	4	nos.	1,170
Sub-total			9,245
Missoluce (10%of sub-total)			925
Total			**10,170**

Table 9 Annual Disbursement Schedule (Financial Cost)

(Unit : 1,000 Z$)

Work Item	Total Cost	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1. Pilot Project	257,653	26,873	71,112	156,588	1,540	1,540	-	-	-	-	-	-
2. Kudu Project												
(a) Kudu Dam	3,640,574	221,711	313,817	634,552	662,949	753,235	602,515	451,795	-	-	-	-
(b) Canal System	3,519,230	154,846	154,846	-	577,858	705,958	802,384	641,908	481,431	-	-	-
(c) On-farm System	2,188,450	96,292	96,292	-	-	-	-	399,173	538,796	558,930	498,967	-
3. Livestock												
(a) Livestock Water Developmen	1,584	-	-	-	285	348	396	317	238	-	-	-
(b) Grazing Area Development	3,960	-	-	-	-	-	-	-	1,320	1,320	1,320	-
4. Rural Infra												
(a) Road	134,115	5,901	5,901	-	-	-	36,694	42,810	42,810	-	-	-
(b) Borehole	140,365	6,176	6,176	-	-	-	38,404	44,805	44,805	-	-	-
(c) Communication System	11,537	508	508	-	-	-	-	5,261	5,261	-	-	-
5. Agricultural Support Services												
(a) Agricultural Extension Cente	11,020	-	-	-	-	-	-	5,510	5,510	-	-	-
(b) Extension Services	10,777	-	-	-	-	-	-	2,155	2,155	2,155	2,155	2,155
Total	9,919,265	512,307	648,652	791,140	1,242,631	1,461,081	1,480,393	1,593,733	1,122,325	562,406	502,442	2,155
O & M Cost		*0*	*0*	*789,600*	*2,030,691*	*3,490,232*	*4,970,625*	*6,562,203*	*7,682,372*	*8,242,622*	*8,742,909*	*0*
		0	*0*	*9,475*	*24,368*	*41,883*	*59,647*	*78,746*	*92,188*	*98,911*	*104,915*	*0*

FIGURES

Figure 1 Implementation Schedule

Work Items	Work Q'ty	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th
1. Feasibility Study	--														
2. Detailed Design & Pre-construction Work	--														
3. Environmental Management Components															
(a) Resettlemnt Action	L.S.														
(b) Land Re-allocation	L.S.														
4. Pilot Project															
(a) Nyarupakwe Dam and Small Dam	2 nos.														
(b) Irrigation & Drainage	60 ha														
(c) Livestock	L.S.														
(d) Rural Infrastructure	L.S.														
(e) Institutional Strengthening	L.S.														
(f) Agricultural Support Services	L.S.														
5. Kudu Dam Irrigation System															
(a) Kudu Dam	1 no.														
(b) Main & Secondary Irrigation Canal System	178 km														
(c) On-Farm Development															
- Communal and Resettlement Areas	14,500 ha														
- Small Scale Commercial farm	6,000 ha														
- Large Scale Commercial Farm	4,500 ha														
6. Livestock															
(a) Livestock Water Development Scheme	72 units														
(b) Grazing Area Development Scheme	10 units														
7. Rural Infrastructures															
(a) Rural Road Improvement	279 km														
(b) Construction/Rehabilitation of Boreholes	191 nos.														
(c) Improvement of Communication System	L.S.														
8. Agricultural Support Services															
(a) Agricultural Extension Center	2 units														
(b) Extension Services	L.S														