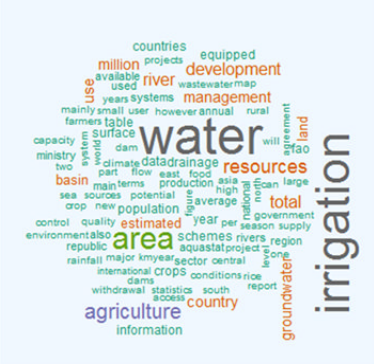

Irrigation Systems Inventory

Inception Report: Part 4/5 – Field survey methodology

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Contents

Executive summary

This report is the fourth in a series of inception phase reports on the development of an Irrigation Scheme Inventory (ISI) of smallholder irrigation schemes in Zimbabwe. It focuses on the methods developed for collecting the data that will be housed in the database, and the subsequent field testing of the survey instruments.

The development of the data collection methodology is informed by the preceding steps in this project – the Literature Review, Stakeholder Consultations and preliminary Database Development. Separate reports are available for each of these steps.

The report describes the development of two data collection tools – the ISIF (ISI Form) and ISIDG (ISI Discussion Guide). The ISIF contains 94 data fields that are populated using a combination of secondary data (from DOI) and primary data (focus group discussions and key informant interviews). Focus Group Discussions at the irrigation schemes are guided by the ISIDG which is designed to solicit Boolean and pre-coded responses suitable for a computerised database system.

The methodology developed involves firstly, a visit to DOI to solicit secondary data, and secondly, a visit to the field where the FGD and KIIs are done. Key informants are the Agritex and DOI officers resident at the scheme.

The report describes two types of resource personnel that would be needed to operate the ISI project – an ISI Manager and Field Research Officers (field enumerators). Since these positions are obviously not filled at this time, pilot testing of the methodology was done using a consultant (the 'Manager') and provincial Agritex and DOI officers (the 'Field Research Officers').

The methodology developed in this study worked well in the practical pilot field test undertaken at two irrigation schemes in Manicaland. Information provided for almost all of the data fields was relatively easy to source. A record kept of time and resources will be used to develop the ISI business model, which represents the final step of this Inception project.

Introduction

Agriculture contributes 15-20% to Zimbabwe's Gross Domestic Product, estimated at US$ 11.427 billion in 2012 (GOZ, 2012), and accounts for 40% of the nation's exports (GOZ, 2013a). The sector accounts for 25% of formal employment and provides livelihoods for over 70% of the rural population. The sector is central to the economy in guaranteeing food security and backward and forward linkage to markets. The agro-processing industry draws some 63% of its input requirements from agriculture (GOZ, 2013a).

The government of Zimbabwe has prioritised irrigation development since 1930 when it embarked on a national dam construction programme for large scale commercial farmers (GOZ, 2004). In a country where agriculture is dependent on a single rainy season (November through March) irrigation is an important strategy for increasing productivity through:

- Provision of supplementary water during mid-season dry spells, or seasonal droughts.
- Winter production of crops such as pulses (sugar beans), cereals (wheat) and horticulture.

In addition, access to irrigation allows farmers to explore the production of new, higher valued crops.

According to the World Bank (2013a), the country now has more than 8 000 dams which in 2000, commanded more than 120 000 ha of irrigation land[1]. The Fast Track Land Reform Programme that commenced in 2000, and the related decade-long period of economic decline, contributed to a reduction in this irrigated area. The same report estimates that in 2012 the area under irrigation was only 51 000 ha[2] (*ibid.*).

Government policy is to rehabilitate these idle irrigation schemes before developing new ones (e.g. GOZ, 2013b). It is estimated that about 200 000 ha can be developed from existing under-utilized storage capacity and dams under construction (World Bank, 2013b). Furthermore, the irrigation potential of the country is estimated at around 365 000 ha, considerably less than irrigable land, estimated at 600 000 ha (*ibid.*).

The Government of Zimbabwe continues to promote irrigated agriculture through various policy documents including the Medium Term Plan (GOZ, 2011), CAADP compact (GOZ, 2013c), Zimbabwe Agricultural Investment Programme (GOZ, 2013a), Zim-Asset (GOZ, 2013d) and most recently, the 2014 National Budget Statement (GOZ, 2013b).

Since independence in 1980 government has focused on irrigation development in communal farming areas, many of which are located in drought-prone regions. Over 180 smallholder schemes have since been developed on communal and old resettlement schemes commanding an area of 8103 ha (GOZ, 2004). A further 2000 ha have been

[1] This value is based on satellite imagery. However estimates vary widely in the literature. For example, the ZAIP document (GOZ, 2013a) reports that 200 000 ha were irrigated in 2000

[2] See Footnote 1. The ZAIP report (GOZ, 2013a) estimates that 135 580 ha was under irrigation in 2009. World Bank (2013b) estimate that between 70 000 and 135 000 ha are currently being irrigated. The equivalent estimate in Zim-Asset (GOZ, 2013d) is 150 000 ha.

developed on small scale commercial farms. Thus a total of up to 10000 ha of irrigation are available in the formal smallholder subsector (*ibid.*). One of the features of these schemes is that, for the most part, they are stuck in a recurring cycle of build, operate, decline and rehabilitation with the latter process usually being funded by government or international donors on a grant basis. To this end, government has allocated US$9.4 million for communal irrigation schemes in the 2014 budget, whilst the Swiss government recently provided a grant for the rehabilitation of Rupike and Pfuve Panganayi irrigation schemes in Masvingo Province. This cycle points to a lack of capacity of scheme beneficiaries to maintain their equipment. World Bank (2013a) note that a lack of technical capacity also extends to national institutions such as ZINWA.

According to World Bank (2013a), the restoration of irrigation infrastructure is necessary *but not sufficient* to restore irrigated agricultural production. Other constraints include uncertainties about land tenure, absence or dilapidated infrastructure, unreliable power supplies and weak input and output markets. They argue that past budgetary allocations by the Ministry of Finance have not been effectively used because of these constraints. There is thus a need to focus on 'software' (i.e. capacity) and market issues as well as the more obvious hardware limitations.

It is against this background that Welthungerhilfe (WHH) and GIZ through the Food Security and Agriculture Programme plan to develop methods and tools that will assist investors (private sector, government and donors) in making decisions on selection of irrigation schemes providing the best investment opportunities. WHH and GIZ have considerable experience in smallholder irrigation system development and the smallholder farming sector in Zimbabwe and throughout the developing world. These organisations have contracted Floranature, an agricultural consulting firm specialising in the smallholder farming sector, to develop the framework for an Irrigation Systems Inventory (ISI).

This report is the fourth in a series of five, documenting the methods developed for data collection and the field testing of survey instruments. It draws on a number of resources completed by the ISIS team during the earlier stages:

- A review of international and Zimbabwean literature of the development of Irrigation Scheme Inventories.
- Report on Stakeholders Analysis and Consultations.
- Database Design Report.

Acronyms used in this report

Agritex	Department of Agricultural, Technical and Extension Services
AISP	Agricultural Inputs Supply Programme
CAACP	Comprehensive African Agricultural Development Programme
DOI	Department of Irrigation
FGD	Focus Group Discussion
FRO	Field Research Officer
GIZ	Deutsche Gesellschaft fur lnternationale Zusammanarbait
GOZ	Government of Zimbabwe
ha	Hectare
IMC	Irrigation Management Committee
ISI	Irrigation System Inventory
ISIF	Irrigation System Inventory Form
KII	Key Informant Interview
ISIDG	Irrigation System Inventory Discussion Guide
km	Kilometre
M&E	Monitoring and Evaluation
N/A	Not applicable
N/C	Not completed
NGO	Non Governmental Organisation
SDC	Swiss Development Cooperation
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
WB	World Bank
WHH	Welthungerhilfe
WSIA	Water Sector Investment Analysis
ZESA	Zimbabwe Electricity Supply Authority
Zim Asset	Zimbabwe Agenda for Sustainable Socio-Economic Transformation
ZIMSTAT	Zimbabwe National Statistics Agency
ZINWA	Zimbabwe National Water Authority

Data collection methods in the literature

The literature review[3] shows that irrigation inventories have been developed and used for a number of purposes including prioritising investments in Zimbabwe (WB, 2013; SDC, 2010), development of national strategies in Tajikistan (UNDP, 2013) and evaluating the results of investments in Sri Lanka (Groenfeldt, 1989). In nearly all instances, irrigation inventories included a wide range of data fields categorized in the review under (1) material resources (water, land and infrastructure) and (2) human resources (scheme demographics and management, and agricultural productivity and marketing).

The inventories assessed in the review made use of a combination of primary and secondary data sources to compile the requisite information. Gathering secondary data from published and unpublished records available from the offices of relevant government institutions, was usually the first step prior to field work. This was then generally followed by a site visit where farmers, their committees or local government agents were questioned using informal data collection tools such as key informant interviews (KIIs), farmer Focus Group Discussions (FGDs) and walk through inspections of irrigation networks in the company of farmers and/or irrigation staff. The use of KIIs and FGDs is consistent with the need to cover a large number of irrigation schemes relatively quickly in a cost effective manner.

Most of the data categories in the inventory (e.g. location, water resources, infrastructure, management, agricultural production and marketing) are populated with the type of data that is fairly easily provided by key informants, so there is less need for a formal sample survey. Whilst a formal sample survey of irrigators would yield more representative production performance data (e.g. average cropped area and average yields) this type of information accounts for a relatively small share of the data fields in most of the inventories reviewed. Undertaking a formal sample survey at every irrigation scheme across the country to supply information for a few fields in the irrigation scheme inventory is unlikely to justify the level of resources required.

The field methodologies developed in this document are informed by previous stages in this ISI project, combined with experience in developing instruments in Zimbabwe and elsewhere.

[3] The Literature Review was the first in a series of five ISI reports.

Data collection tools and methodology

There are a number of key challenges in designing a data collection strategy to populate a national database:

- **Sources of information**: How best to design a data collection tool that can integrate information from a wide range of data sources and different types of information. Such information can range from verifiable facts about the location and water source obtained from official data sources, to more qualitative types of data on the condition of the infrastructure and the management of the scheme that are likely to be answered through a site visit and interviews with key informants and local irrigators.
- **Adaptability of the instruments**: The data collection instruments that are designed need to be applicable across the full range of irrigation schemes found in the smallholder sector.
- **Data collection process**: It is important to ensure that the methodology for collecting data for a national database is well defined, especially if being done by multiple agencies.
- **Enumerator competency:** There is a need to identify data collectors with the requisite skill level for accurately completing the ISI Form and facilitating FGD with farmers.

This section of the report is divided into three parts. The first two of these challenges are dealt with in the section on developing the instruments. Methodology is the topic of the second section, whilst enumerator competency is considered the third.

Irrigation scheme assessment tools

The data collection strategy uses the two assessment tools which are and reproduced in the appendices – the Irrigation Scheme Inventory Form (ISIF) and the Irrigation Scheme Inventory Discussion Guide (ISIDG).

Irrigation Scheme Inventory Form (ISIF)

The reader is invited to review the ISIF (presented as Appendix 2) whilst reading this section of the report. This form is designed to capture all the priority information on the current status of irrigation schemes (both hardware and software) *irrespective of the source* of information. It is likely that the responses on the form will be completed at different times by different individuals.

The form includes all of the categories and data fields identified by stakeholders as the main ones necessary for assisting investors (government, donors and private sector) in making decisions on the selection of irrigation schemes that provide the best investment opportunities. The responses on the inventory form provide the data that will be used to populate a national irrigation database. The five categories of information covered in the form follow the ISI database structure[4]:

[4] The Database Development Report was the third in a series of five ISI reports

A: Water Resources
B: Land Resources
C: Infrastructure
D: Socio Economics and Management
E: Agricultural Productivity and Marketing

A column headed 'Ref' provides the field with a unique identifying number that has a corresponding number in the database. This will assist in data capture and population of the database at the next stage.

The ISIF is designed to elicit Boolean (Yes/no) or pre-coded responses to questions rather than narrative description. This allows for consistency in data collected across schemes and for ease of processing by computers and subsequent incorporation of information into a database.

The availability of information from different sources can only be confirmed after the pilot survey. For this reason, in addition to a column indicating 'planned' data source there is also space provided on the form to indicate 'actual' source of information and the ease with which the data can be collected. This information will assist in reviewing the ISIF during the pilot testing phase in order to make adjustments to categories and data fields prior to a national roll out.

In cases where a question can be completed using information from more than one source the implementing organisation has the opportunity to triangulate responses before completing the form.

Irrigation Scheme Inventory Discussion Guide (ISIDG)

The ISIDG is presented as Appendix 3 to this report. It is a separate supplementary data collection tool which guides discussions between the data collection officer and farmers and key informants relating to information that relies on *local knowledge*. Such information includes the condition of the scheme, farmer involvement in scheme management and crop production activities at the scheme.[5] This data collection framework is designed for a rapid appraisal site visit with farmers at the irrigation scheme from which information can be transferred to the main irrigation inventory form, once it has been verified.

The ISIDG provides a more formal direction for discussions with farmers than is normally envisaged for a participatory process. This is largely due to the need to ensure consistency in the manner in which FGDs are implemented across the country at different irrigation schemes by different research officers. In addition the use of pre-coded responses facilitates recording farmers' responses in a manner which lends itself to inclusion in a database structure designed to be populated with primarily numerical and categorical data.

[5]In the past ZIMSTAT has carried out an annual crop and livestock survey of smallholder irrigation schemes but due to lack of resources and the changes in this sector following the recent land reallocation exercise, this has not happened since 2003. If this survey is reinstated annual updates of the crop production for all irrigation schemes will be a valuable input to the national irrigation sector database.

Data collection process

This section describes the stepwise process by which the data will be collected.

Step 1 Secondary data collection

Prior to field work, secondary data fields will be completed using information from the central data at the Department of Irrigation (DOI). This could be done for several schemes at once from a particular district or province followed by sites visits to each scheme, scheduled over a longer period of time, to complete the remaining questions on the ISIF.

At the end of the pilot study there will be a better indication of the data that is available from DOI Headquarters. At the minimum, existing records of irrigation schemes should provide information for completing the ISIF fields listed in Table 1.

Table 1: Data fields to be completed from secondary data provided by the Department of Irrigation

Section 1		Section 2		Section 3		Section 4	
Ref	Query	Ref	Query	Ref	Query	Ref	Query
C001	Name of scheme	B001	Location of scheme - Province	A001	What is the primary source of water for this irrigation scheme?	D201	Number of irrigating families - planned
C002	How many sections at the scheme?	B002	Location of scheme - District		Is there a secondary source of water?		
C003	Names of the sections.	B003	Location of scheme - Wards	A002	If Yes, What is the secondary source of water?		
C004	Water delivery system			A015	What natural agro-ecological zone is the scheme in?		
C005	Irrigation system type			A021	What is the catchment area? (ha)		
C006	Year of scheme commissioning						
C007	Year when farmers started irrigating						

Step 2 Planning the field visit

The field visit to the Irrigation scheme is scheduled beforehand. The local Agritex or DOI officer is asked to organise a small group (6-12) farmers for a FGD. The group should include both female and male irrigators and some members of the Irrigation Management Committee (IMC).

Step 3 Activities on arrival at the scheme

On arrival at the irrigation Scheme, there should be introductions to the local Agritex and/or DOI officers and a confirmation made of the schedule for the visit. The procedure will be firstly to meet with farmers *on their own* for a FGD and secondly, to hold a follow up meeting with local Agritex and/or DOI officers (KII's) to get their assistance in completing the ISIF. It is important that the process is clearly explained, particularly why the Agritex and DOI staff should not be present for the FGD so that the farmers and IMC are free to speak, so as to avoid suspicion and gain the confidence of all involved.

Step 4 Focus Group Discussions

The research officer's should meet with the small group (6-12) of farmers described in Step 2. If the group is too big it will be difficult to manage the discussion; too small a group risks not having a sufficient range of farmer experience to cover the breadth of topics covered in the ISIDG. The Local DOI and/or Agritex Officer should be asked to assist in convening the farmer group. Their presence during farmer discussions is not generally encouraged because it may constrain farmers from sharing their views. The Research Officer needs to be sensitive to the local situation and use his/her judgment in this regard.

It is recommended that the Research Officer is accompanied on the field visit by an assistant who can take notes during the FGDs. Farmers should be invited to be open and honest in sharing their views and be assured that their responses are confidential and that the record of the discussions will include no references to individual names.

The ISIDG form is used to solicit such information as farmer's views on the condition of the scheme, farmer involvement in irrigation management and crop production and marketing. Farmer responses are entered directly onto the form to provide a record of discussions.

Step 5 Key Informant Interviews

Based on the experiences of irrigation inventories undertaken in other countries (e.g. Groenfeldt, 1989) it is recommended that FGDs with irrigators are held *prior* to KIIs with local government officers. The KIIs, in addition to providing responses to specific questions on the form, provide an opportunity to follow up and verify information provided by farmers before it is entered on the inventory form. In this manner information is triangulated from several sources.

KIIs are done with the Agritex and/or DOI officer. The enumerator will go through the ISIF methodically and

- Verify secondary data obtained from DOI.
- Verify information obtained from FGDs with farmers and transcribe the verified results of the FGD onto the ISIF. If there are any issues where farmers and key informants differ in opinion a note of this is made under the comments section at the end of the form.
- Ask the Agritex and/or DOI officer to assist in completing the KII questions on the ISIF.

Step 6 District office interviews

There may be certain questions on the ISIF that might be better answered at the district of provincial office levels. Informants could include DOI, Agritex or ZINWA.

Step 7 Submitting the forms

It is possible that the submission of the ISIF and ISIGD forms might eventually be done online from a district office. However in the beginning it is likely that submission of the physical document will be done at the district level. It is recommended that two photocopies are made of the two completed forms. The originals would go to the administrator of the ISI database with copies being kept for DOI and Agritex Provincial/ District records.

The data collection agency and staff requirements

The agency

To a large extent, the identity of the agency will depend on who takes ownership of the database. During consultations with stakeholders, the majority agreed that the ISI is a public good and that ultimately ownership should be with the government. The obvious identity of government enumerators might therefore be Agritex or DOI staff.

- Agritex have officers posted at nearly every scheme in the country whilst DOI are represented at the provincial level if not at district level. Agritex undertake annual crop assessments and would be well place to undertake this work. DOI is eager to participate in the ISI and over the years have built up experience in administering questionnaires, the most recently for the Water Sector Investment Analysis (WSIA) undertaken by a team of consultants from the World Bank (WB, 2013a).
- Another option is a dedicated non- government team of specialist enumerators who would visit schemes on a rolling basis to collect information. This would be an efficient but expensive mechanism for collecting information. Bearing this in mind data collection activities will be piloted with the assistance of staff from both DOI and Agritex with support from WHH/AISP staff.
- It is also possible that data could be collected by organisations (mainly development partners) working at the scheme. This approach might seem cheaper but is likely to result in inconsistencies in approach and inaccuracies. It would therefore be essential to verify information, which would be likely to be a costly exercise.
- After the development of the instruments a visit was made to the Zimbabwe National Statistics Agency (ZIMSTAT) who also expressed an interest in owning and administering the ISI database (see Appendix 1 for more detail).

Staff requirements

The 7-step process described above requires for data to be collected from a number of different sources at national, provincial, district and local levels. This section of the report outlines the requirements for the composition of the ISI team.

It is recommended that the ISI implementing agency work employ a Data Collection Manager, with the overall responsibility over the field enumeration team(s). Collecting of

good data to complete the ISIDG requires skill and in order to reflect this, the title given to field enumerators is ISI Field Research Officers (FROs). Terms of References for the Data Collection Manager and FRO positions and are provided in Appendix 4.

Requirements for the pilot

This position of ISI Manager will only be filled once the ISI programme is operational. The consultant will perform duties required for the completion of the form. The FROs are likely to comprise a combination of DOI and Agritex officers. GIZ are working with Agritex in their AISP programme and would want them to be involved in this work.

It was recommended that the FROs be provided with training in the pilot study to complete all the fields in the ISI form that can be completed at provincial, district and ward levels. In particular, the enumerators should be trained on

- Conducting FGDs using the ISIDG.
- Selecting the appropriate stakeholders that need to be interviewed in order to collect primary data, or in order to triangulate evidence provided by other informants.
- Conducting stakeholder interviews.

Field testing

The Terms of Reference required that field testing of the instrument be done at two irrigation schemes ion Manicaland. After consultations with Welthungerhilfe, GIZ and DOI the two schemes selected were Nyaramvure Irrigation Scheme in Nyanga District and Osborne Irrigation Scheme in Mutare District. These schemes represent two very different situations in terms of water source, system type and current functionality (see Appendix 5).

DOI had been updated on progress of the ISI progress since the start of the Inception Programme. A request to the Department for assistance in facilitating the field testing of the instruments resulted in their request to include an officer from headquarters in the field team. They also agreed to assign an officer from the Provincial Headquarters.

Field testing of the ISIF and ISIDG took place from 27-29 August 2014. The three day programme included:
Day 1: Travel Harare to Mutare; Training of Research Officers.
Day 2: Visit to and testing of the tools at Nyaramvure Irrigation Scheme, Nyanga.
Day 3: Visit to and testing of the tools at Osborne Irrigation Scheme, Makoni

The purpose of the field trip was threefold:

- Determining the suitability of the 7-step procedure
- Determining the suitability of the ISIF and ISIDG instruments
- Determining the costs of the field trip in order to develop the business model in the next and final phase of the ISI Inception programme.

Field testing of the methodology

In this section of the report we describe the suitability of the 7-step procedure outlined a previous section.

Step 1 Secondary data collection

Pilot testing procedure

Secondary data collection started on Monday 25 August 2014 with a visit by the consultant to DOI headquarters in Harare. Once introductions and explanations had been completed, the gathering of secondary data was relatively quick, taking about half an hour for each scheme. Obtaining secondary information from DOI accounted for less than 20% of the information collected on the ISI.

Implications for ISI procedure

The ISI Manager would be responsible for entering the secondary data onto the ISIF prior to the field work. This procedure would be relatively quick.

Step 2 Planning the field visit

Pilot testing procedure

It was important to communicate well in advance with all parties to ensure that they were fully informed of dates, times, places and expectations. A reminder was sent out two days before departure. Provincial or district officers were requested to organise the correct protocols for field visits.

For all meetings, whether at the DOI national headquarters, DOI/Agritex provincial/district offices or at the irrigation scheme it was important to ensure the objectives and process was clearly explained so as to minimize distrust and ensure full cooperation.

Provincial Agritex and DOI staff, and a GIZ officer were trained in the use of the instruments using the following procedure:

- An explanation was provided of the overall purpose of developing and populating the ISI database.
- The ISIF and ISIDG forms were reviewed by going systematically through them and the notes on each page.

The process was unhurried, allowing plenty of time to explain the reasons for the different questions and why they were being asked.

Practical details of how the field visit would take place the following day were discussed and arrangements concluded.

Implications for ISI procedure

In this pilot, the provincial DOI and Agritex officers played the role of the FRO. The following checklist is drawn up for the ISI Manager for use during the ISI implementation phase:

- The FRO, district DOI and Agritex officers (who could be the FRO's). Find the local DOI and Agritex officers at the scheme.
- Copies of Appendix 2 and 3 (ISIF and ISIDG respectively) forms – enough for one for each irrigation scheme being assessed, each of the Research Officers to be trained, and extras to give to DOI and Agritex staff along the way.
- Clip board to hold the forms.
- Flipchart, stand and pens to write down lists where needed (e.g. what are the main crops grown) and in order to rank them. This is an invaluable aid.
- GPS to get coordinates of the scheme.
- Money to buy the IMC and DOI/Agritex staff a drink and biscuits to share.
- Camera.

Step 3 Activities on arrival at the scheme

Pilot testing procedure

A similar routine was used for both field visit days. On the way to the scheme local officers were collected, if not to be met at the irrigation scheme. Once there, there was usually a short time before the arrival of all irrigators and the Irrigation Management Committee (IMC). Once the group (irrigators, IMC, Agritex and DOI staff) was in place, an explanation was provided for the purpose of the visit and discussion, before asking the local Agritex and DOI staff to leave.

Implications for ISI procedure

The ISI Manager should be aware that

- It is inadvisable to arrive at the scheme before 0900 as it might interfere with the irrigators early morning activities.
- Care needs to be taken to explain to the local KIIs (resident DOI and Agritex officers) why they are to be excluded during the FGDs so that they are not offended.
- A few minutes at the end of each day spent reviewing the visit is time well spent. In addition, it is a good time to run through the arrangements for the next day so as to ensure everything is in place for an early start.

Step 4 Focus Group Discussions

Pilot testing procedure

The ISIDG form was used to guide discussions with the irrigators and IMC. One Research Officer asked the questions and led the discussion, sometimes using a flipchart to write down their answers and rank them. The other officer recorded responses on the ISIDG.

On the first day, at Nyaramvure, discussions were lead by the consultant. The DOI and Agritex officers, playing the role of the FRO, lead the proceedings on the second day at Osborne.

Implications for ISI procedure

The completion of the ISIDG went remarkably well, with farmers being able to answer most of the questions. The only slight difficulties arose when questions soliciting a proportional response were asked – for example, what proportion of farmers own dryland plots? Some minor improvements were recommended for the ISIDG which have been incorporated in the final version presented as Appendix 3.

Step 5 Key Informant Interviews

Pilot testing procedure

After completion of the ISIDG form, the DOI and Agritex officers were recalled and interviewed using the ISIF. Their answers were then cross referenced with the responses provided by irrigators/IMC in the ISIDG in order to finalise the answer on each question.

Implications for ISI procedure

This procedure worked well. At both schemes most of the 94 data fields were completed (see the next section for details on the instruments). Some minor improvements were recommended for the ISIF which have been incorporated in the final version presented as Appendix 2.

Step 6 District office interviews

Pilot testing procedure

The completion of the ISIF at the scheme made it unnecessary to do further interviews at the provincial office.

Implications for ISI procedure

In practice, Step 6 might not be required for all schemes.

Step 7 Submitting the forms

Pilot testing procedure

The completed handwritten instruments were returned to Harare where they were entered into an Excel spreadsheet (Appendix 5).

Implications for ISI procedure

The final procedure for handling of completed ISI forms will depend on the ISI implementing agency.

In conclusion, the field methodology developed in this study worked well in practice, with only minor changes being made to the forms. These are discussed on more detail in the next section.

Populating the forms

Appendix 5 shows the data collected using the ISIF for Nyarumvurwe and Osborne schemes. Data was collected for 94 fields split into the five categories, namely:

A: Water Resources

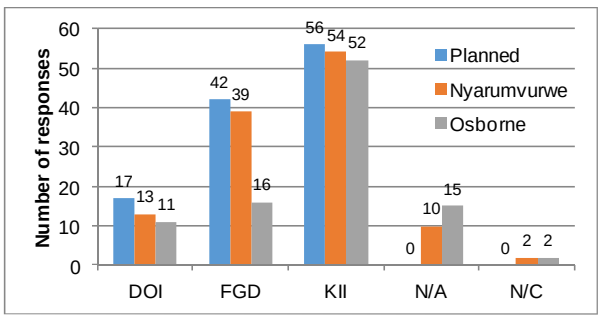
B: Land Resources

C: Infrastructure

D: Socio Economics and Management

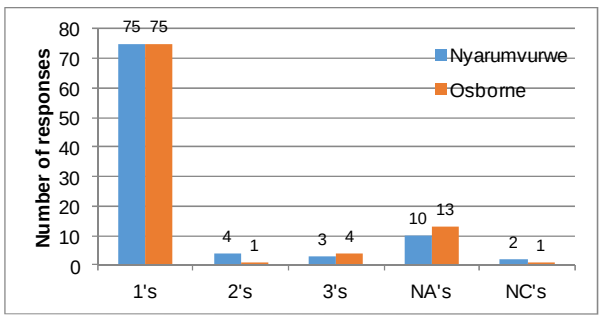
E: Agricultural Productivity and Marketing

Interesting differences emerge between the two schemes that are not discussed in this report which is more interested in the development of methodology. Needless to say, the selection of these two schemes was appropriate as they represent two different scenarios.



Notes on abbreviations: DOI=Information provided by Department of Irrigation Headquarters; FGD=Information provided by Focus Group discussion and recorded on the ISIDG; KII= Information provided by local officers at the scheme; N/A=Questions not applicable to the scheme; N/C=Answers not captured

Figure 1: Number of responses from different types of respondents at the two schemes used in the pilot



Notes on abbreviations: 1=No problem in collecting information; 2=moderate effort requested to get information; 3=Information collected with difficulty; N/A=Questions not applicable to the scheme; N/C=Answers not captured

Figure 2: Ease of collecting data at the two schemes tested in the pilot

Figure 1 is presented to illustrate the success of the methodology presented in this report. The planned data collection from different respondents generally matches well with what actually transpired at the two schemes. Thus for example, it was anticipated that KIIs would result in 56 of the fields being filled – the corresponding figures were 54 and 52, at Nyarumvurwe and Osborne, respectively. Some of the questions were not relevant, particularly at Osborne where the scheme was not functioning and farmers were unable to provide information during the FGDs. Data for a small number of fields was not collected.

Figure 2 shows that data was collected for the 94 fields with relative ease. This was also predicted in the planning stage (data not shown). Of the total number of fields, 92 and 93 were completed at Nyarumvurwe and Osborne, respectively.

It is concluded that the methodology proposed in this report is suitable for the purpose of populating the ISI database.

Budgetary considerations

One of the important requirements of the field testing phase was to determine costs to assist on the development of the business model. Time requirements are presented in Appendix 6 whilst the main resources that need consideration are listed below:

- Daily subsistence allowance: this will vary per organization, and by seniority of officer.
- Salaries/wages for research officers. This may not be needed if using existing staff from DOI or Agritex.
- Small cash float to buy drinks and biscuits for farmers and KII's:: suggest $20/day.
- Accommodation for researcher officers (e.g. Wise Owl Motel: $65/night + $15 breakfast.
- Mileage: work on $0.50/km
- Printing of forms.
- Flipcharts and pens for FGDs (hopefully can borrow a flipchart stand).

Development of the business model is the next and final stage of the ISI Inception phase.

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Appendix 1 Potential roles of ZIMSTAT in the ISI

Preparations for the implementation of a *national* irrigation database have to be approved by ZIMSTAT. According to the Census and Statistics Act 1/2007 (chapter 10:29), ZIMSTAT has a mandate to maintain and sustain the national statistics database; specifically to:

- Co-ordinate and supervise the National Statistical System;
- Collect, compile, analyse, interpret, publish and disseminate statistical information alone or in co-operation with other Government Ministries or institutions; and
- Develop and maintain a comprehensive national statistics database.

Relevant sections of the Act are reproduced below.

The operations of ZIMSTAT are controlled and managed by the ZIMSTAT Board which monitors compliance with best practices and international recommendations on the production of official statistics. ZIMSTAT is represented on this board by the Director General.

If the ISI is to have official statistics, as requested by DOI, then the methodology for implementing it will need to be approved by this Board. Ultimately, if the ISI is owned by Government the maintenance of such a database would be the responsibility of ZIMSTAT. On this basis ZIMSTAT also expressed an interest in owning and administering the ISI database.

The Act

Part 4 section 15 of the Act covers Censuses and statistical surveys by other persons and specifies that:

(2) Where any Government Ministry or institution or other person proposes to conduct a census or statistical survey at a national level he or she shall, before conducting such census or survey—
(a) furnish particulars of the proposal to the Board; and
(b) satisfy the Board that appropriate statistical procedures will be followed.

(3) The Board shall review every proposal submitted in terms of subsection (2) within a reasonable time and in any case not later than thirty days after it has been submitted.

(4) Where the Board has any objection to the statistical procedures to be followed by the person who submitted the proposal, it shall afford that person a reasonable opportunity to make representations on the matter.

(5) Where the Board approves a proposal referred to in subsection (2), the Government Ministry, institution or person shall, after conducting such census or survey, deposit the results attained with the Agency.

(6) The Minister—

(*a*) may, on the recommendation of the Board, by statutory instrument, make rules concerning the procedures to be followed with respect to proposals submitted to the Board in terms of subsection (2);

(*b*) shall, in consultation with the Board, issue a code of practice that sets out professional standards and ethics to be followed by all persons producing official statistics.

Appendix 2 ISIF – final version after field testing

Irrigation Scheme Inventory Form (ISIF)
Zimbabwe Irrigation Schemes
1st Draft (Priority Information)

Irrigation Scheme Number: |___||___||___||___|

Irrigation Scheme Inventory Form (ISIF) date completed: |__||__| - |__||__| - |__||__|

Name of Research Officer completing ISIF: _____

Organisation: _____ Position: _____

Name of Irrigation Scheme: _____

Province: _____ District: _____

Instructions to Research Officer(s) completing Irrigation Scheme Inventory Form (ISIF):

The information for completing the irrigation scheme inventory questionnaire is likely to come from a number of different sources including the central database of the Department of Irrigation (DOI), various key informants and farmers at the irrigation scheme. The planned or expected source of data for each question is indicated in the column labelled 'Tool' under the heading 'plan'. This is a field test of the inventory questionnaire so please assist in assessing this instrument by indicating the 'actual' tool l or source used for the information provided in the response and the ease with which the data is obtainable. Use the codes below. Where it is planned that a question is answered using information obtained from a focus group discussion (FGD) with farmers at the irrigation scheme, this information is only entered on the inventory form after it has been discussed and verified by an Agritex or Irrigation Officer based at the scheme. It is recommended that the research officer is accompanied for the field visit to the irrigation scheme by an assistant who can take notes during the FGD with farmers.

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Tool or source of information used to complete the question	Ease with which information obtained
1- Published data (DOI or AGRITEX) 2- Other published or unpublished data or reports 3- Key informant – outside the irrigation scheme (e.g. district or provincial officer) 4- Key informant at irrigation scheme (e.g AGRITEX or Dept irrigation officer, local leader, IMC member, farmer etc) 5= Focus group discussion with farmers 6= other (specify)	1- Easy 2- With some effort 3- Difficult

The recommended steps in completing this inventory form are:

- *Using the database of DOI complete all secondary data fields on the form.*
- *Schedule a field visit to the Irrigation scheme and ask the local Agritex or DOI officer to organise **a small group (6-10) farmers** for a FGD. The group should include both female and male irrigators and some members of the Irrigation Management Committee or any of the IMC sub-committees.*

Visit scheduled for _____(date) _____ (Time)

- *On arrival at the irrigation Scheme, introduce yourselves to the local Agritex &/or DOI officers. Carefully explain the process to be followed so as to reassure the farmers and KII, and build trust.*
    a. *Meet first with farmers on their own for a FGD*
    b. *Have a follow up meeting with the Agritex and/or DOI officers to get their assistance in completing the Irrigation Inventory Form*
- *Hold FGD with farmers using the Irrigation Scheme Inventory Focus Group Discussion Guide (ISIDG) . Farmer Responses are entered directly on the ISIDG (Appendix 2).*
- *Carry out key informant interview with Agritex and/or DOI officer. Go through each question on the Irrigation scheme Inventory Form (ISIF – see Appendix 1)) and*
    a. *Verify secondary data obtained from DOI*
    b. *Verify information obtained from FGDs with farmers. Transcribe the verified results of the FGD onto the irrigation scheme inventory form. Use the codes in the "Ref" column in ISIF and ISIDG to match the questions correctly. Note that in the ISIF, the related code from ISIDG is included in brackets to make finding them chronologically easier..*
    c. *Collect additional information to complete the Irrigation Scheme Inventory Form*
    d. *Make two photocopies of completed Irrigation Scheme Inventory Form (ISIF) and Irrigation Scheme Inventory Focus Group Discussion (ISIDG) record. Submit originals to ISI database administrators, keep one copy each for DOI and Agritex Provincial/ District records.*

Ref	A: Water Resources	Circle or Enter Response	Tool		Ease
			Plan	Actual	
A001	What is the primary source of water for this irrigation scheme?	**1**= Spring **2**= River **3**= River with weir **3**= Dam **4**= Borehole **5**= other(specify)_____	**DOI**		
	Is there a secondary source of water?	**1=** Yes **2** = No	**DOI**		
A002	If Yes, What is the secondary source of water?	**1**= Spring **2**= River **3**= River with weir **3**= Dam **4**= Borehole **5**= other(specify)_____	**DOI**		
A010 (A3)	How many years, in the past 5, was there sufficient water for the summer cropping programme?	|___| years	**KII/ FGD**		
A011 (A4)	How many years in the past 5 was there sufficient water for the winter cropping programme?	|___| years	**KII/ FGD**		
A012 (A5)	Is there conflict between irrigators on the use of water? If yes, Explain what they are???	1= Yes 2 = No …… .	**KII/ FGD**		
A015	What natural agro-ecological zone is the scheme in?	1= I 2= IIA 3= IIB 4 = III 5= IV 6= V	**DOI**		
A021	What is the catchment area?	|___||___||___||___||___| sq. km's ??	**DOI**		

Ref	B:Land Resources	Circle or Enter Response		Tool		Ease
				Plan	Actual	
B001	Location of scheme - Province			**DOI**		
B002	Location of scheme - District			**DOI**		
B003	Location of scheme - Wards	Name		**DOI**		
		No.		**DOI**		
B004	GPS coordinates of scheme	Latitude		KII		
		Longitude		KII		
B005	What category of land is the scheme on?	1= communal 2= resettled A1 3= resettled A2 4= resettled A3 5= small scale commercial 6= large scale commercial 7= other (specify)		KII		
B006	What is the potential scheme command area?	|___||___||___||___|ha's		KII		
B007	What is the actual scheme irrigated area in the current season in summer?	|___||___||___||___|ha's		KII		
B008	What is the actual scheme irrigated area in the current season in winter?	|___||___||___||___|ha's		KII		
B009	Are all plots the same size?	**1=** Yes **2** = No		FGD		
B010	What is the most common (mode) plot size (ha)?	|___||___|| **.** ||___||___|ha's		FGD		
B011	What proportions of farmers have the most common plot size?	1= 1 - 25 % 2= 26 -50% 3= 51 -75% 4= 76 -100%	☐	FGD		
B014	What percentage of the design area is being irrigated?	|___||___| %		KII		
B015	Is there potential to increase command area?	1= Yes 2 = No		KII		

Ref	C:Infrastructure	Circle or Enter Response	Tool		Ease
			plan	actual	
C001	Name of scheme	Primary: …….. Alternate: ……	DOI		
C002	How many sections at the scheme?	|___||___|	DOI		
C003	Names of the sections.	…….. …….. ……..	DOI		

C004	Water delivery system	**1**= pump **2**= gravity		DOI		
C005	Irrigation system type	**1**=Flood/gravity **2**=sprinkler & drag hose **3**= sprinkler and lateral, **4**= drip **5**= centre pivot		DOI		
C006	Year of scheme commissioning	|___||___||___||___| year		DOI		
C007	Year when farmers started irrigating	|___||___||___||___| year		DOI		
C012	Describe the overall condition of the scheme	1= Sound, no cause for concern 2= Mostly sound, but needs minor R&M 3= Not sound, extensive R&M required 4= Unsound, life threatening		FGD/ KII		
C013	What is the condition of the reservoir?	1= Sound, no cause for concern 2= Mostly sound, but needs minor R&M 3= Not sound, extensive R&M required 4= Unsound, life threatening		FGD/ KII		
C014	Are there obvious signs of siltation of the dam, weir, and river source?	1= Yes 2 = No		FGD/ KII		
C016	Condition of main & infield conveyance system	1= Good, no appreciable losses 2= Ok, need some R&M to reduce losses 3= Poor, need major work to rehabilitate. 4= Not applicable		FGD/ KII		
C017	Condition of drip lines and emitters	1= Good, no appreciable losses 2= Ok, need some R&M to reduce losses 3= Poor, need major work to rehabilitate. 4= Not applicable		FGD/ KII		
C018	When was the last summer cropping season farmers were able to complete the cycle using irrigation?	|___||___||___||___| year		FGD/ KII		
C019	When was the last summer cropping season farmers were able to complete the cycle using irrigation?	|___||___||___||___| year		FGD/ KII		
C020	If there has been a break in cropping due to no irrigation, what was the main reason?	1= no/intermittent water 2= pumps not working 3= electricity not paid 4= water conveyancing system unserviceable 5=other (specify)		FGD/ KII		
C023	How many times has the scheme been rehabilitated since commissioning?	|___||___|		KII		
C024	What year were system repairs last done?	|___||___||___||___| year		KII		
C034	What is the condition of the final	**1**= bad		KII		

	1-5 km of road leading into the scheme	**2**= reasonable **3**= good				
C035	Is there an all-weather road leading to within 5 km of the scheme?	**1**= Yes **2** = No		KII		
C036	What is the condition of any bridges leading to the final 1-5 km of road leading into the scheme	**1**= bad **2**= reasonable **3**= good		KII		
C037	How many storage sheds are there at the scheme?	|___||___|		KII		
C040	Describe the cell phone access?	**1**= bad **2**= reasonable **3**= good		KII		

Ref	D:Socio Economics & Management	Circle or Enter Responses		Tool		Ease
				plan	actual	
D201	Number of irrigating families - planned	|___||___||___||___|		**DOI**		
D202	Number of irrigating families - current	|___||___||___||___|		**KII**		
D216	Do any farmers own dry land plots?	1= Yes 2 = No		**KII/ FGD**		
D217	What proportion of farmers own dry land plots?	1= 1 - 25 % 2= 26 -50% 3= 51 -75% 4= 76 -100%	☐	**KII/ FGD**		
D302	Is there an Irrigation Management Committee (IMC)?	1= Yes 2 = No		FGD		
D305	How many times were IMC meetings held in the last six months?	|___||___|		FGD		
D402	Is there a constitution available?	1= Yes 2 = No		FGD		
D408	Are there bye-laws available?	1= Yes 2 = No		FGD		
D414[a]	Who is responsible for the management of the irrigation system?	**1**= Fully farmer **2**= fully government 3= Government & farmer **4**= other(specify)_____		FGD		
D414[b]	Who is responsible for the maintenance of the system?	**1**= Fully farmer **2**= fully government 3= Government & farmer **4**= other(specify)_____		FGD		
D415	How well is the IMC operating	**1**= poorly functioning **2**= reasonably well **3**= very well		KII/FGD		

D432	What percentage of farmers supports the IMC? (E.g. attend scheme meetings or attend community work parties on the scheme?)	1= 1 - 25 % 2= 26 -50% 3= 51 -75% 4= 76 -100%		FGD		
D503	Is the IMC registered with any organisation?	1= Yes 2 = No		FGD		
D504	if yes, With which organisation is the IMC registered?			FGD		
D506	Is any outside individual/organisation allowed to instruct the IMC what farmers should do?	1= Yes 2 = No		FGD		
D507	if yes, Which individual/organisation?			FGD		
D514	What is the financial status of the IMC?	1= Profitable 2= Break- even 3= in debt		FGD		
D522	Does the IMC owe money to ZINWA?	1= Yes 2 = No		FGD		
D523	Does the IMC owe money to ZESA?	1= Yes 2 = No		FGD		
D524	What is the total ZINWA + ZESA debt?	US$ |___||___||___||___||___|		FGD		
D525	Is there legal water right at level of system or farmer organisation?	1= Yes 2 = No		KII/ FGD		
D530	Name of IMC Chairman			KII		
D531	Cell phone number IMC chairman			KII		
D532	Name of IMC vice-Chairman			KII		
D533	Cell phone number IMC vice chairman			KII		

Ref	E. Agricultural Productivity and Marketing	Circle or Enter Response		Tool		Ease
				Plan	Actual	
E001	What is the predominant soil type?	**1**= Sandy **2**= sandy loam **3**= loam **4**= sandy clay loam **5**= clay loam **6**=clay **7**= other(specify)_____		KII		
E002	What proportion of the area has the predominant soil type?	|___|___||___| %		KII		
E006	Is there a problem with waterlogging & drainage?	**1=** Yes **2** = No		KII		

E009	What proportion of farmers grow two crops per year?	|___|___||___| %				KII		
E010	What proportion of farmers grow three crops per year?	|___|___||___| %				KII		
E011	What are the main three crops in summer?					FGD /KII		
E012	What are the main three crops in winter?					FGD /KII		
1= green mealies, 2= maize, 3= sugar beans, 4= tomatoes, 5= wheat, 6= butternuts , 7= English potatoes, 8= cabbages, 9= carrots, 10= other (specify)								
E013	What is the total area of the main THREE crops for the wet (summer) season in the last year (ha)?					KII		
E014	What is the total area of the main THREE crops for the dry (winter season) in the last year (ha)?					KII		
E017	What is the average maize yield at the scheme in the last season?	|___||___||___||___|kg/ha				KII		
E018	What is the average wheat yield at the scheme in the last season?	|___||___||___||___|kg/ha				KII		
E019	What is the average sugar bean yield at the scheme in the last season?	|___||___||___||___|kg/ha				KII		
E020	What is the average tomato yield at the scheme in the last season? (kg/ha)	|___||___||___||___|kg/ha				KII		
E032	Which organisation(s) have full time staff present at the scheme?	Agritex	1= Yes 2 = No			KII		
		Dept of Irrigation	1= Yes 2 = No					
		Pvt sector((specify)	1= Yes 2 = No					
		NGO(specify)	1= Yes 2 = No					
		other (specify)	1= Yes 2 = No					
E033	What is the total number of Agritex staff at the scheme?	|___||___|				KII		
E035	Have any NGOs supported farmers at the scheme in the past?	1= Yes 2 = No				KII		
E036	if yes, What are the names of the NGOs that have worked at the scheme?					KII		
E037	if yes, What was the last year when the *last* NGO was at the scheme?	|___||___||___||___|Year				KII		
E038	if yes, What is the name of the NGO?					KII		

E039	What type of support did the NGO provide to farmers? (circle all that apply)	1= Extension support 2= input support 3= infrastructure rehabilitation 4= infrastructure construction 5= marketing support 6= irrigation management training 7= other (specify)		KII		
E043	What proportion of farmers grows crops for marketing in summer season?	1= 1 - 25 % 2= 26 -50% 3= 51 -75% 4= 76 -100%		FGD /KII		
E044	Which are the main three crops that are marketed in summer? (use E012 codes)			FGD /KII		
E043	What proportion of farmers grows crops for marketing in winter season?	1= 1 - 25 % 2= 26 -50% 3= 51 -75% 4= 76 -100%		FGD /KII		
E044	Which are the main three crops that are marketed in winter? (use E012 codes)			FGD		
E052	Have farmers at the scheme been involved in contract farming?	1= Yes 2 = No		FGD /KII		
E053	What is the NAME of the most widespread contracted crop grown in the past 5 seasons?			FGD /KII		
E054	What was the biggest area per farmer that was contracted at the scheme for this most widespread crop? (ha)	|___||___|| . ||___||___|ha's		FGD		
E055	What is the NAME of the contract company for this most widespread crop?			FGD		
E059	Are many farmers in debt?	1= Yes 2 = No		FGD		
E060	Who are farmers in debt to?	1= micro insurance companies 2= contract farming companies 3= other (specify)		FGD		

Comment on any areas where views of key informants differ with opinions of local farmers

Additional Comments

Comment on any other issues relevant to potential investors (government, donors or private sector) .

Appendix 3 ISIDG – final version after field testing

Discussion Guide

Irrigation Scheme Inventory Focus Group Discussion (ISIDG)

Instructions: *Arrange to meet with a small group of (6-10) farmers at the irrigation scheme to discuss the condition of the scheme, farmer involvement in managing the scheme and agricultural activities at the scheme. The group should include both male and female irrigators and members of the irrigation management committee. It is intended that discussions with farmers should be completed at the irrigation scheme prior to the key informant interview with local Agritex and DOI officers, who will assist in verifying information provided by farmers.*

Thank you for coming today to this discussion about _____ irrigation scheme. My name is _____ and I have been asked by _____ organisation to assist in collecting information about irrigation schemes in this province. I will be guiding the discussion. My colleague is _____, and he/she will be taking some notes about our conversation because what you share is very important and we do not want to miss anything you say.

Today we will be talking about your experiences of being a farmer on this irrigation scheme including your views on the condition of the irrigation scheme, farmer involvement in irrigation management and crops grown and marketed in summer and winter. We encourage you to be open and honest in sharing information. Your answers to the questions should not be considered "right" or "wrong". Some of you may have differing opinions or thoughts, so please understand that it is okay to disagree. All of our experiences and stories are equally important. Please be assured that all your responses are confidential and our summary report will make no references to individual names.

Ref	A. Understanding the overall condition of the irrigation scheme	
C012	A.1 How would you describe the overall condition of this scheme? *(E.g. sound no cause for concern, mostly sound – minor R and M needed, not sound - major R and M needed. Unsound - life threatening)*	
C013 - C017	A.2 What are the main challenges with the irrigation infrastructure? (*Assist the farmers to put together a list of main challenges (E.g. condition of reservoir, siltation, infield conveyance of water, drip lines etc) and rank the challenges in order of importance/priority).*	
A010	A.3 How many years in the past 5 was there sufficient water for summer cropping?	|___|years

A011	A.4 How many years in the past 5 was there sufficient water for winter cropping?	|___|years
A012	A.5 Is there conflict between irrigators on the use of water. Explain what they are.	

Ref	B: Irrigation management and involvement of farmers	
D202	B.1 Number of irrigating families - current	|___||___||___||___|
D302	B.2 Is there an Irrigation Management Committee (IMC) at this scheme and if so, what are the main functions of the IMC? *(Assist the farmers to put together a list of the main functions of the IMC and rank the functions in order of importance)*	
D402	B.3 Is there a constitution available?	
D408	B.4 Are there bye-laws available?	
D305	B.5 How often has the IMC met in the last 6 months?	|___|times
D414[a]	B.6 Who is responsible for the management of the irrigation system?	**1**= Fully farmer **2**= fully government 3= Government & farmer **4**= other(specify)_____
D414[b]	B.7 Who is responsible for the maintenance of the system?	**1**= Fully farmer **2**= fully government 3= Government & farmer **4**= other(specify)_____
D415[a]	B.8 How well is the IMC operating - what are its strengths and weaknesses? (*Assist the farmers to put together a list of main strengths and weaknesses of the IMC and rank them in order of importance)*	
D432	B.9 What percentages of farmers support the IMC? (E.g. as shown by % of farmers who attend scheme meetings, or attend community work parties on the scheme?)	1= 1 - 25 % 2= 26 - 50% 3= 51 - 75% 4= 76 -100%
D503	B.10 Is the IMC registered with any	Yes/No

	organisation?		
D504	B.11 if yes, With which organisation is the IMC registered?		
D506	B.10 Is any individual or organisation allowed to instruct the farmers what to do		Yes/No
D507	If yes, Which individual or organisation? When was the last time farmers were told what to do.		
D514	B.10 What is the financial status of the IMC (e.g. profitable, break even, in debt) & What explains this situation?		
D522/4	B.11 Does the IMC owe money to ZINWA? If yes, How much?	Yes/No	US$|___||___||___||___||___||___|
D523/4	B.12 Does the IMC owe money to ZESA? If yes, How much?	Yes/No	US$|___||___||___||___||___||___|
D525	Is there legal water right at level of system or farmer organisation?	Yes/No	
D530	Name of IMC Chairman		
D531	Cell phone number IMC chairman		
D532	Name of IMC vice-Chairman		
	C: Agricultural Production and Marketing		
B009	C.1 Are all plots the same size?	Yes/No	
B010	C.2. What is the most common (mode) plot size (ha)?	|___||___|| . ||___||___|ha's	
E011	C.3 What crops grown on the irrigation scheme in summer? (*assist the farmers in listing all the crops and then rank the top 3 according to area)*		
E043[a]	C.4 What proportion of farmers grow crops for marketing in summer season?	1= 1 - 25 % 2= 26 - 50% 3= 51 - 75% 4= 76 -100%	☐
E044	C.5. Which are the main three crops that are marketed in summer?		

E012	C.6 What crops are grown on the irrigation scheme in winter? (*assist the farmers in listing all the crops and then rank the top 3 according to area)*		
EO43[b]	C.7 What proportion of farmers grow crops for marketing in winter season?	1= 1 - 25 % 2= 26 - 50% 3= 51 - 75% 4= 76 -100%	☐
E044	C.8 Which are the main three crops that are marketed in winter?		
E052	C.12 Have farmers at the scheme been involved in contract farming? If yes, What crops have been contracted in the past 5 seasons? (*assist farmers in listing all crops that have been contracted and then rank top 3)*		
E053	C.13 What is the <u>NAME</u> of the most widespread contracted crop grown?		
E054	C.14 What was the biggest area per farmer that was contracted at the scheme for this most widespread crop? (ha)	|___||___|| . ||___||___|ha's	
E055	C.15 What is the NAME of the contract company for this most widespread crop?		
E059 - E60	C.16 Are a significant number of farmers in debt? If yes, who are farmers in debt to?		
C037	C.17 How many storage sheds are there at the scheme?	|___||___|	
D216 - D217	C.17 Do any farmers also own dry land plots? If yes, What proportion of farmers own dry land plots?	Yes/No	1= 1 - 25 % 2= 26 - 50% 3= 51 - 75% 4= 76 -100% ☐

Other Issues
Are there any other matters about this irrigation scheme that you would like to tell us about? (*Give the farmers some time to raise other issues that they would like to discuss before you conclude the discussion time*)

Thank you for your time.

Appendix 4 Terms of Reference for the ISI staff positions

Position: ISI Data Collection Manager

Responsibilities:

- Develop the strategy and timeframe for data collection from provincial, district and ward (scheme) levels
- Selecting members of the field enumeration team
- Coordinating activities of the field data collection team
- Training field enumerators in data collection methods
- Collecting secondary data at the national level
- Quality control of field data collection
- Overseeing data capture and ensuring the quality thereof

Requirements:

- Work experience within an agricultural setting essential
- The candidate should possess good management skills, and have experience in managing a team of enumerators
- The candidate will need good communication and rapport building skills to oversee data collection across a wide cross section of respondents at national, provincial, district and local levels.
- Must be keen and attentive to details to ensure that forms accurately reflect the situation at the irrigation schemes.
- Able to work with minimal supervision and be proactive
- Experience with research including secondary data interrogation, key informant interviews and farmer focus group discussions essential
- Minimum educational requirement is a degree in agriculture, preferably with an irrigation bias.
- M&E and training experience are important
- Fluent spoken and written English and one or more local languages
- Familiar with computers
- Clean driving licence
- Minimum age 25 years

Position: Field Research Officer

Responsibilities:

- Conducting key informant interviews and field surveys to complete an Irrigation Scheme Inventory Form for designated smallholder irrigation schemes
- Carry out field interviews/focus group discussions with farmers at smallholder irrigation schemes and document discussion
- Hold key informant interviews with district/local officials from Agritex , DOI and ZIMWA to verify information collected and complete the Irrigation Sector Inventory Form
- Reporting field level information, data entry and coordinating with Irrigation Scheme Inventory Data Collection Manager

Requirements:

- Candidates should possess good communication and rapport building skills and be able to carry out interviews across a wide cross section of respondents at national, provincial, district and local levels.
- Must be keen and attentive to details and have ability to follow instructions and procedures for completing forms properly.
- Work experience within an agricultural setting essential
- Able to work with minimal supervision and be proactive
- Experience with research including key informant interviews and farmer focus group discussions preferred
- Minimum educational requirement is post school qualification in agriculture or related subject (agricultural economics, geography, business studies, management, environmental sciences etc)
- Fluent spoken and written English and one or more local languages
- Familiar with computers
- Clean driving licence
- Minimum age 25 years

Appendix 5 Completed ISIF

		Nyarumvurwe					Osborne			
ID	Survey Question	Response	Planned informant	Actual informant	Ease of info access		Response	Planned informant	Actual informant	Ease of info access
A001	What is the primary source of water for the irrigation scheme? (e.g. spring, river)	4= Dam	DOI	DOI	1		2=River	DOI	DOI	1
A002	What is the secondary source of water? (e.g. spring, river)	N/A	DOI	N/A	N/A		N/A	DOI	N/A	N/A
A002a	Is there a secondary source?	2=No	DOI	DOI	1		2=No	DOI	DOI	1
A010	How many years in the past 5 is there sufficient water for the summer cropping programme?	5 years	KII/FGD	KII	1		5	KII/FGD	KII	1
A011	How many years in the past 5 is there sufficient water for the winter cropping programme?	5years	KII/FGD	KII	1		5	KII/FGD	KII	1
A015	What natural agro-ecological zone is the scheme?	3=IIB	DOI	DOI	3		4=III	DOI	DOI	3
A021	What is the name of the catchment area?	River Nyangombe	DOI	DOI	3		N/C	DOI	N/C	3
B001	Location of scheme - Province	Manicaland	DOI	DOI	1		Manicaland	DOI	DOI	1
B002	Location of scheme - District	Nyanga	DOI	DOI	1		Mutare	DOI	DOI	1
B003	Location of scheme - Wards	Nyarumvurwe Ward 3	DOI	DOI	1		Nyamajura Ward1	DOI	KII	1
B004	GPS coordinates of scheme	Lat S 18 14. 084' Long E 032 38 191'	DOI	KII	3		Lat 18 47.386' Long 032 28.18'	DOI	KII	3
B005	What category of land is the scheme on?	7=Old Resettlement	KII	KII	1		2= Old Resettlement	KII	KII	1
B006	What is the potential scheme command area (ha)?	150 ha	KII	KII	1		100ha	KII	KII	3
B007	What is the actual scheme irrigated area in the current season in summer (ha)?	39 ha	KII	KII	1		0ha	KII	KII	1
B008	What is the actual scheme irrigated area in the current season in winter (ha)?	39 ha	KII	KII	1		0ha	KII	KII	1
B009	Are all plots the same size?	2=No	FGD	FGD	1		1=Yes	FGD	FGD	1
B010	What is the most common (mode) plot size (ha)?	0.1 ha	FGD	FGD	1		0.5	FGD	KII	1
B011	What proportion of farmers have the most common plot size?	3=51-75%	FGD	KII	1		4=76-100%	FGD	FGD	1
B014	What percentage of the design area is being irrigated?	26	KII	KII	1		0%	KII	KII	1
B015	Is there potential to increase command area?	1=Yes	KII	KII	1		1=Yes	KII	KII	1
C001	Name of scheme	Nyarumvurwe	DOI	DOI	1		Osborne Alt: Nyamazura	DOI	KII	1
C002	How many sections are there at the scheme?	2	DOI	FGD	1		3	DOI	DOI	1
C003	Name of the section?	1. left bank 2.Right bank	DOI	FGD	1		Block A, Section ?, Block B	DOI	DOI	2

C004	Water delivery system	2= gravity	DOI	DOI	1		1= Pump	DOI	DOI	1
C005	Irrigation system type	1= Flood/gravity	DOI	DOI	1		2=Sprinkler and drag hose	DOI	DOI	1
C006	Date of scheme commissioning	2006	DOI	DOI	1		2007	DOI	DOI	1
C007	Date when farmers started irrigating	2006	DOI	KII	1		2002	DOI	DOI	1
C012	Describe the overall condition of the scheme	2=Mostly sound but needs minor R&M	FGD/KII	FGD/KII	1		3=Not sound, extensive R&M required	FGD/KII	KII	1
C013	What is the condition of the reservoir?	2=Mostly sound but needs minor R&M	FGD/KII	FGD/KII	1		1=Sound, no cause of concern	FGD/KII	KII	1
C014	Is there obvious signs of siltation of the dam, weir, river source?	1=Yes	FGD/KII	FGD/KII	1		2=No	FGD/KII	FGD/KII	1
C016	Condition of infield conveyance system (b)	2=Ok, need some R&M to reduce losses	FGD/KII	FGD/KII	1		2= Ok, need some R&M to reduce losses	FGD/KII	KII	1
C017	Condition of drip lines and emitters (f)	N/A	FGD/KII	N/A	N/A		N/A	FGD/KII	N/A	N/A
C023	How many times has the scheme been rehabilitated since commissioning?	0	KII	KII	1		2	KII	KII	1
C024	What year were system repairs last done?	N/A	KII	N/A	N/A		2014	KII	KII	1
C034	What is the condition of the final 1-5 km of road leading into the scheme	2= Reasonable	KII	KII	1		1=Bad	KII	KII	1
C035	Is there an all weather road leading to within 5 km of the scheme?	1=Yes	KII	KII	1		2=No	KII	KII	1
C036	What is the condition of any bridges leading to the final 1-5 km of road leading into the scheme	2=Reasonable	KII	KII	1		3=Good	KII	KII	1
C037	How many storage sheds are there at the scheme?	0	KII	FGD/KII	1		0	KII	KII	1
C040	Describe the cell phone access?	3=Good	KII	KII	1		N/C	KII	N/C	N/C
D201	Number of irrigating families - planned	261	DOI	FGD/DOI	2		200	DOI	KII	1
D202	Number of irrigating families - in current season	261	KII	FGD/DOI	1		41	KII	KII	1
D216	Do any farmers own dryland plots?	1= Yes	KII/FGD	KII/FGD	1		1=Yes	KII/FGD	KII	1
D217	What proportion of farmers own dryland plots?	4=76-100%	KII/FGD	KII/FGD	1		4=76-100%	KII/FGD	KII	1
D302	Is there an IMC?	1=Yes	FGD	FGD/KII	1		1=Yes	FGD	FGD/KII	1
D305	How many times were IMC meetings held in the last six months?	12	FGD	FGD	1		24	FGD	FGD	1
D402	Is there a constitution available?	1= Yes	FGD	FGD	1		1=Yes	FGD	FGD	1
D408	Are there bye-laws available?	1= Yes	FGD	FGD	1		1=Yes	FGD	FGD	1
D414a	Who is responsible for the management of the irrigation system?	3= government and farmers	FGD/KII	FGD/KII	1		3= Government and farmer	FGD/KII	FGD	1
D414b	Who is responsible for the maintenance of the system?	3=government and farmers	FGD/KII	FGD/KII	1		3=Government and farmer	FGD/KII	FGD	1
D415	How well is the IMC operating	2= reasonably well	KII/FGD	KII/FGD	1		1=Poorly functioning	KII/FGD	KII	1
D432	What percentage of farmers support the IMC?	3=51-75%	FGD	FGD/KII	1		2= 26-50%	FGD	KII	1
D503	Is the IMC registered with any organisation?	2=No	FGD	FGD/KII	1		2=No	FGD	KII	1
D504	With which organisation is the IMC registered?	N/A	FGD	N/A	N/A		N/A	FGD	N/A	N/A

D506	Is any outside individual/organisation allowed to instruct the IMC what farmers should do?	2=No	FGD	FGD/KII	1		1=Yes	FGD	KII	1
D507	Which individual/organisation?	N/A	FGD	N/A	N/A		WADCO, Contractors, Councillor, Local MP	FGD	KII	1
D514	What is the financial status of the IMC?	3= In debt	FGD	FGD	1		3=In Debt	FGD	FGD	1
D522	Does the IMC owe money to ZINWA?	1= Yes	FGD	FGD	1		1=Yes	FGD	FGD	1
D523	Does the IMC owe money to ZESA?	2=No	FGD	FGD	1		1=Yes	FGD	FGD	1
D524	What is the total ZINWA plus ZESA debt?	2000	FGD	FGD	1		12 517	FGD	KII	1
D525	Is there a legal water right at level of system or farmer organization?	1=Yes	KII/FGD	KII/FGD	1		2=No	KII/FGD	KII	1
D530	Name of IMC Chairman	Partson Chakapema	KII	FGD	1		Joshua Madziwa	KII	FGD	1
D531	Cell phone number of IMC chairman	771461325	KII	FGD	1		773159947	KII	FGD	1
D532	Name of IMC Vice Chairman	1.Trymore Makoni 2.Pardon Garapo	KII	FGD	1		Gladys Chikuni	KII	FGD	1
D533	Cellphone number of IMC vice chairman	1.0776325225 2. 0773167595	KII	FGD	1		773192179	KII	FGD	1
E001	What is the predominant soil type?	2=Sandy loam	KII	KII	1		2= Sandy loam	KII	KII	1
E002	What proportion of the area has the predominant soil type?	100%	KII	KII	1		75%	KII	KII	1
E006	Is there a problem with drainage?	1=Yes	KII	KII	1		2=No	KII	KII	1
E009	What proportion of farmers grow two crops per year?	25%	KII	KII	1		0%	KII	KII	1
E010	What proportion of farmers grow three crops per year?	75	KII	KII	1		0%	KII	KII	1
E011	What are the main THREE crops for the wet (summer) season?	10. 0nions 3. sugarbeans 2. Maize	FGD/KII	FGD/KII	1		N/A	FGD/KII	N/A	N/A
E012	What are the main THREE crops for the dry (winter) season in the last year?	10. Onions 3. sugarbeans	FGD/KII	FGD/KII	1		N/A	FGD/KII	N/A	N/A
E013	What is the total area of the main THREE crops for the wet (summer) season in the last year (ha)?	39Ha	KII	KII	1		0	KII	N/A	1
E014	What is the total area of the main THREE crops for the dry (summer) season (ha)?	39Ha	KII	KII	1		0	KII	N/A	1
E017	What is the average maize yield at the scheme in the last season? (kg/ha)	3300	KII	KII	1		N/A	KII	N/A	N/A
E018	What is the average wheat yield at the scheme in the last season? (kg/ha)	N/A	KII	N/A	N/A		N/A	KII	N/A	N/A
E019	What is the average sugar bean yield at the scheme in the last season? (kg/ha)	1250	KII	KII	2		N/A	KII	N/A	N/A
E020	What is the average tomato yield at the scheme in the last season? (kg/ha)	N/A	KII	N/A	N/A		N/A	KII	N/A	N/A
E032	Which organisations have full time staff present at the scheme?	AGRITEX, DOI	KII	KII	1		AGRITEX, DOI	KII	KII	1
E033	What is the total number of Agritex staff at the scheme?	1	KII	KII	1		1	KII	KII	1
E035	Have any NGOs supported farmers at the scheme?	1=Yes	KII	KII	1		1=Yes	KII	KII	1
E036	What are the names of the NGOs that have worked at the scheme?	1. GAA 2.Practical Actions	KII	KII	1		IRC	KII	KII	1
E037	What was the last year when the *last* NGO was at the scheme?	2014	KII	KII	1		2013	KII	KII	1

E038	What is the name of the NGO?	Practical Action	KII	KII	1		IRC	KII	KII	1
E039	What type of support did the NGO provide to farmers?	Extension, Input, Marketing, Irrigation Management Training support	KII	KII	1		Extension, Input and marketing support	KII	KII	1
E043	What proportion of farmers grow crops for marketing in summer?	4=76-100%	FGD/KII	FGD/KII	1		N/A	FGD/KII	N/A	N/A
E043	What propotion fo farmers grow crops for marketing in winter	4=76-100%	FGD/KII	FGD/KII	1		N/A	FGD/KII	N/A	N/A
E044	Which are the main three crops that are marketed in summer?	2=Maize 3=Sugarbeans 6=Butternuts	FGD/KII	FGD/KII	2		N/A	FGD/KII	N/A	N/A
E044	Which are the main three crops that are marketed in winter?	10=Onions 3=sugarbeans ?	FGD	FGD/KII	2		N/A	FGD	N/A	N/A
E052	Have farmers at the scheme been involved in contract farming?	2=No	FGD/KII	FGD/KII	1		1=Yes	FGD/KII	KII	1
E053	What is the name of the most widespread contracted crop grown over the past 5 seasons?	N/A	FGD/KII	N/A	N/A		Sweet potatoes Tobbaco chillies	FGD/KII	KII	1
E054	What was the biggest area that was contracted at the scheme for this most wodespread crop? (ha)	N/A	FGD	N/A	N/A		0.5	FGD	KII	1
E055	What is the name of the contract company for this most widespread crop?	N/A	FGD	N/A	N/A		Northen Tobacco	FGD	KII	1
E059	Are a significant number of farmers in debt?	N/C	FGD	N/C	N/C		1=Yes	FGD	KII	1
E060	Who are farmers in debt to?	N/C	FGD	N/C	N/C		3=Banks	FGD	KII	1

Appendix 6 Tables of activities and time requirements for field work

Table of Activities and Time requirements

ISIF = Irrigation Scheme Inventory Form (Appendix 1)

ISIDG = Irrigation Scheme Inventory Discussion Group (Appendix 2)

Date/Time	Activity	Time (hrs:mins)	Comment
Mon. 18/8/14 0930-1020	Collection of secondary data from DOI (2 irrigation schemes)	25 mins /scheme	Once through the introductions & explanation of what we are doing, the actual gathering of secondary data is quite quick.
Wed. 27/8/14 1045-1415 1430-1600 1600-1630 1630-1700	Travel: Hre – Mutare Introductions; Explanation of the mission; training of Research Officers (1 DOI, 1 Agritex) Completion & verification of secondary data from DOI (provincial staff) Practical arrangements for next day.	3hrs 30 1hr 30 30mins 30mins	Time well spent to explain the mission and get support.
Thurs 28/8/14 0630-0700 0700-0845 0845-0905 0905-0930 0930-0950 0950-1135 1135-1150 1150-1300 1300-1430 1430-1630 1630-1715	Visit to Nyarumvurwe IS Gather, load equipment Travel to Nyanga town Meet Agritex DAEO, collect Extension Worker Travel Nyanga to Nyarumvurwe IS. Irrigators & IMC members gathering Completion of ISIDG Break, calling of KII Completion of ISIF with KII, whilst verifying ISIDG. Visit to weir on Nyangombe River (source of irrigation water) and farmers fields. Return journey Admin (receiving allowances from donor); debrief of the day.	 30mins 1hr45 20mins 25mins 20mins 1hr45 15mins 1hr10 1hr30 2hrs 45mins	Total distance = 145kms one way. Also waiting for latecomers in the party. Explanation of the mission. 15km of poor gravel. They were expecting us but were round and about. Start with introductions. Flipchart very helpful for listing items, ranking for priority. No stops. The debrief was a helpful wrap up of the day as well as planning for the next day.
Fri 29/8/14 0745-0800 0800-0910 0910-0950 0950-1010 1010-1145 1145-1305	Visit to Osborne IS Gather, load equipment Travel to Osborne IS. Irrigators & IMC members gathering. Introductions all round Completion of ISIDG Completion of ISIF with KII, whilst	 15mins 1hr10 40mins 20mins 1hr35 1hr20	Total distance = 45kms one way. Used a longer, slower route than return. Included collecting chairs, benches, table. Incl. irrigators, IMC, KII, ourselves.

	verifying ISIDG.		
1305-1320	Break	15mins	
1320-1410	Visit irrigated fields, holding reservoir, Osborne Dam.	50mins	Refreshment break.
1410-1500	Return journey to Mutare.	50mins	
1500-1830	Return journey: Mutare-Harare.	3hrs30	

Recommended times for Planning Field Visits

Activity	**Range of measured times**	**Recommended Planning Time Allowance**
1. Collection of secondary data from DOI	25mins per IS	Allow 30mins for IS; add 30mins travel time to and from DOI.
2. Day 1 (preparations at provincial capital) Travel: Hre-provincial centre. Introductions; Explanation of the mission; training of Research Officers; practical arrangements. Completion & verification of secondary data from DOI (provincial staff)	 3hrs30 each way 2hrs 30mins for two IS.	 Calculate individually for each provincial capital: work on av 80kph. 2hrs Allow 15mins per IS. **Total Day 1 = 2hrs + travel time + 15mins/IS**
3. Day 2 (field visit for ISIF & ISIDG) Gathering, preparations, down time between sessions. Travel to IS Completion of ISIDG Completion of ISIF with KII, whilst verifying ISIDG. Visit to irrigation works and irrigated fields	 1hr10-1hr10 2hrs-4hrs10 1hr45-1hr55 1hr10-1hr20 50mins-1hr30	 1hr10 3hrs 1hr50 1hr15 1hr30 **Total Day 2 = 8hrs45**
4. Distance	90-290kms return	**200kms return trip**