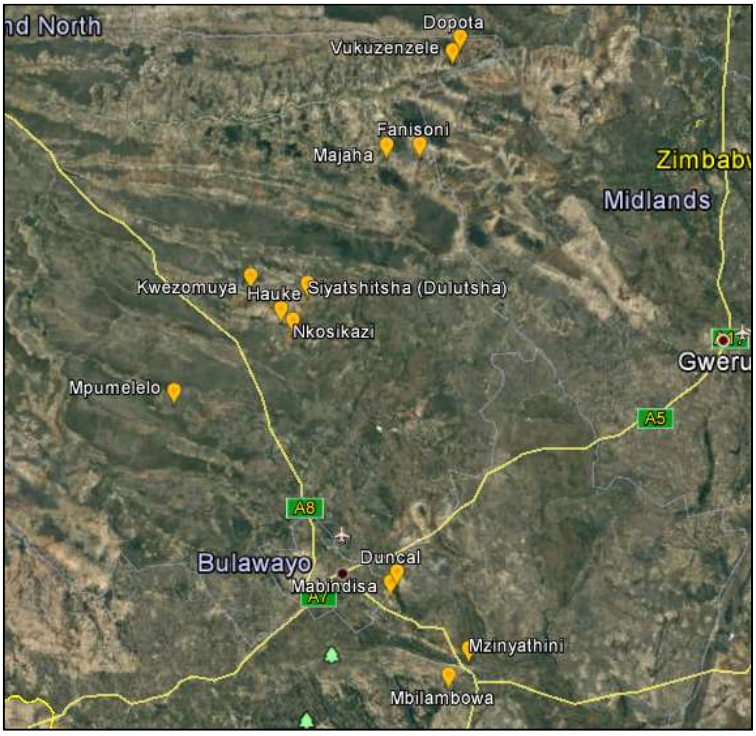
Potential for Commercialisation of Selected Irrigation Schemes

June 2017

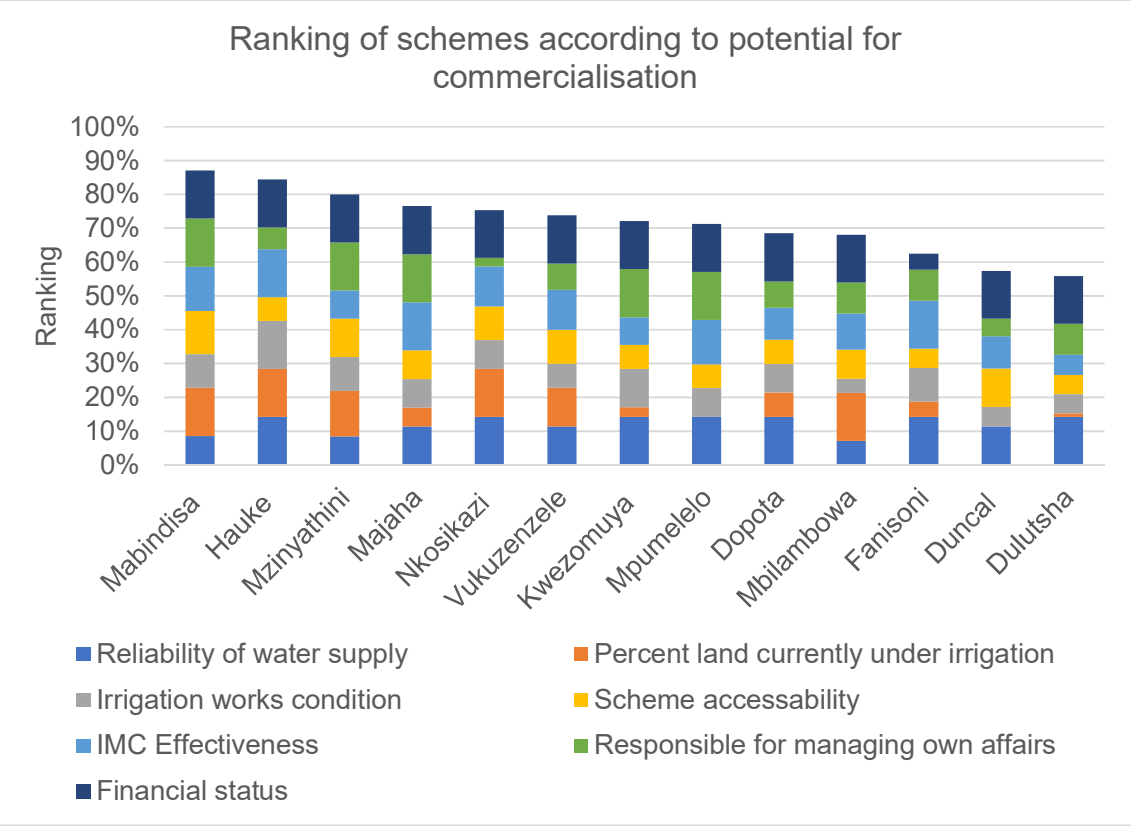
Alan J. Norton



Matabeleland Enhanced Livelihoods, Agriculture and Nutrition Adaptation Programme

MELANA

Dr John Maxwell


Ranking of schemes according to potential for commercialisation
Ranking
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Mabindisa
Hauke
Mzinyathini
Majaha
Nkosikazi
Vukuzenzele
Kwezomuya
Mpumelelo
Dopota
Mbilambowa
Fanisoni
Duncal
Dulutsha
Reliability of water supply
Percent land currently under irrigation
Irrigation works condition
Scheme accessability
IMC Effectiveness
Responsible for managing own affairs
Financial status

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Acronyms used in this report

Agritex	Department of Agricultural, Technical and Extension Services
APT	Agricultural Partnerships Trust
DOI	Department of Irrigation
DAEO	District Agricultural Extension Officer (Agritex)
FGD	Focus Group Discussion (done with a selection of farmers and Irrigation Management Committee, including male and female representation).
FRO	Field Research Officer
IMC	Irrigation Management Committee (made up of irrigators from the scheme).
ISI	Irrigation Scheme Inventory (referring to the tools developed in 2014-15 for assessing and documenting the state of irrigation schemes).
ISIF	Irrigation Scheme Inventory Form.
ISIFGD	Irrigation Scheme Inventory Focus Group Discussion guide.
KI	Key Informant (officials who have some connection with the irrigation scheme and can provide additional information to help in the assessment. Includes Agritex, DOI, ZESA, ZINWA Officers, and financial institution representatives.
MELANA	Matabeleland Enhanced Livelihoods, Agriculture and Nutrition Adaptation
PAEO	Principle Agricultural Extension Officer (Agritex)
ZINWA	Zimbabwe National Water Authority
ZESA	Zimbabwe Electricity Supply Association

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MELANA staff and especially Mr. Michael Dawes and Mr. Rodney Mushongachiware from the APT contingent for their support, encouragement and cooperation.
DOI: for allowing this consultancy to proceed, and for their support and cooperation especially in gathering data.
Agritex: for allowing this consultancy to proceed, and for their support and cooperation especially in gathering data.
Eng. Piet te Velde (private consultant), and Mr Vlanjani Nkomo (Director, Pro-Africa) for their assistance in verifying which schemes exist in the target Wards, and advice.

Executive Summary

The four MELANA districts (Bubi, Nkayi, Umguza and Umzingwane) are situated almost entirely in Natural Region IV of Zimbabwe, which is characterised by low and uncertain rainfall and is generally unsuitable for cash cropping. Irrigation schemes enable farmers in these areas to produce food and cash crops, and improve food and income security. APT's role in the MELANA programme is to introduce markets to farmers throughout the four districts, including those at irrigation schemes. In order to understand the investment opportunity at the different schemes, it was decided to engage a consultant to use assessment methodology developed under the Welthungerhilfe/ GIZ-funded Irrigation Scheme Inventory (ISI) assignment in 2014-15. Two main components of the methodology are the Irrigation Scheme Inventory Form (ISIF) and Irrigation Scheme Inventory Focus Group Discussion (ISIFGD) tools.

Criteria for selection of the schemes to assess was done in consultation with the Department of Irrigation, Agritex and APT staff. It was decided that only schemes of 4 ha and above would be assessed, unless they were within 60 km of Bulawayo, in which case schemes of 3 ha and above would be included. Using this criteria, 13 schemes were identified in MELANA wards of the four districts.

The Consultant updated the list of irrigation schemes and basic data on each scheme in the target Wards. As a result of the assessments, each scheme now has a database ISIF form for future reference.

Recommendations were developed for each individual scheme, and a ranking system established to compare the relative merits and challenges of each schemes in order for potential investors to make informed decisions about investment. Guidelines and considerations have been provided to assist the potential investor in making decisions and build partnerships.

Further recommendations have been made for the future use of the ISIF irrigation scheme assessment form.

The three highest ranking schemes scoring between 80-87% are Mabindisa (87%), Hauke (84%) and Mzinyathini (80%). However, investors are advised to make other considerations when making their decisions such as location, size of scheme, weather and soil conditions.

The lowest ranking schemes, with rankings of 57 and 56%, respectively, are Duncal and Dulutsha. The overall score of Duncal is a reflection of poor management and attitude but could be rectified with some investment in the people and bringing vision and direction. It is a scheme with so much potential.

1.0 Introduction

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 2 000 ha have been developed on small scale commercial farms. Thus, about 10 000 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. 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 Program), with cooperation from Department of Irrigation (DOI), developed methods and tools to assist investors (private sector, government and donors) in making decisions on selection of irrigation schemes providing the best investment opportunities. The Matabeleland Enhanced Livelihoods, Agriculture and Nutrition Adaptation (MELANA) program is a three-year (2017-2019) UNDP-funded program that is being implemented in selected wards of Matabeleland North (Bubi, Umguza and Nkayi Districts) and Matabeleland South (Umzingwane District). MELANA is being implemented by a consortium led by Welthungerhilfe (WHH) in partnership with Community Technology Development Organisation (CTDO), Agricultural Partnerships Trust (APT) and Institute of Environmental Studies (IES). APT is responsible for the successful introduction and sustainable growth of output and service markets to assist farmers in various value chains in overcoming barriers to their successful market integration. Models are developed with the private sector that not only result in increased returns to farmers, but that are also profitable companies. Sustainability requires that all value chain actors make a profit.

The irrigation schemes in the four districts may represent an opportunity for development of market linkages with the private sector. The purpose of this consultancy is to assess these schemes using the ISI tools, and rank them according to potential for successful market linkages.

This report is on the work carried out by the Consultant during the months of March through June 2017, and includes the methodology, survey results (by irrigation scheme), recommendations, (including a ranking system), appendices of survey data, and revised list of irrigation schemes.

2.0 Methodology

The methodology used for the assessment of selected irrigation schemes in the target Districts was based on the Irrigation Scheme Inventory tools developed in 2014-15, and followed the procedures provided under "Scope of Work" (SOW) and "Consultancy Deliverables" provided in the Terms of Reference for the Consultancy. The SOW was broken down into (1) establishment and clarification of the scope and background of the consultancy; (2) establishment of cooperation and participation of DOI and Agritex; (3) inception presentation and discussion with MELANA representatives, DOI and Agritex (Matabeleland North and South), in Bulawayo; (4) visits to key stakeholders; (5) development of program, procedures and processes (site visits program, involvement and training of staff from DOI and Agritex); (6) site visits for assessments (using ISI tools, FGD, KI's) which included verification of the list of schemes; (7) following up on indebtedness of farmers; and (8) development of the ranking system and recommendations for potential investors to select suitable schemes to partner with.

2.1 Scope and Background to the Consultancy

The consultant met and communicated with the Director of APT, who was the key correspondent and overseer of his work, on several occasions. This was in order to establish clarity on the SOW; to understand the key drivers to the consultancy from the potential investors in the irrigation schemes for potential partnerships and market linkages; and in order to keep the direction of the consultancy in line with the spirit and direction for which it was intended. This included discussion and clarification around the provisional list of irrigation schemes that had been provided – see Annex 1 which includes the original list.

2.2 Cooperation and Participation of DOI and Agritex

DOI (Harare) were visited and contacted by telephone and email several times in order to discuss the consultancy, and solicit their support and participation in the process. Another objective was to find out to what extent they had been using the ISI tools themselves. In Matabeleland, contact was made and support/participation discussed with various officials of both Agritex and DOI. Table 1 lists key relationships that were established in order to ensure the success of the scheme assessments.

Table 1: Strategic Relationships of DOI and Agritex officials

Italicized names are for those who were part of the assessing teams, or visited in the field.

	DOI	Agritex
Head Office (Harare)	Director (Dr Zawe) Dep Director (Eng. Bezzel Chitsungo) Irrigation Specialist (Eng Edmund Shorai) Irrigation Specialist (Eng Johnson Zimbabe)	
Mat. North	Prov. Irrigation Engineer (Eng Charles Makhula) *Deputy (Eng Chris Mhlophe)* *Irrigation Engineer (Eng Tapiwanashe Gumbo)*	PAEO (Mr Dumisani Nyoni) Dep PAEO (Mr Vukile Mhlangu) *Specialist (Ms Charity Mapira)* *DAEO-Umgusa (Mr Thulani Ndlovu)* *DAEO-Bubi (Mr Josphat Kujinga)* *DAEO-Nkayi (Ndimande Thabo)*
Mat. South	Prov. Irrigation Engineer (Eng Shepherd Mupotekwa) *Irrigation Technician (Mr Shepherd Mwale)* *Irrigation Engineer (Eng Bezel Garedondo)*	PAEO (Mr Mawocha) *DAEO-Esigodini (Mr Thelani Ncube)* *Specialist (Ms Sheron Masuku)*

2.3 Inception Presentation and Discussion (Bulawayo)

A meeting was held in Bulawayo at the MELANA offices for the inception of the assessment in Matabeleland, on Monday 3 April 2017. This was in order to present the proposed work plan for assessing irrigation schemes in the target Districts and Wards; to discuss and refine (as necessary) the expected outcomes; to discuss the participation of APT, DOI and Agritex officers as Field Research Officers (FRO) in two teams to carry out the work; and to agree on a proposed program of visits. See Annex 2 for to view the PowerPoint presentation made at the inception meeting. The meeting was attended by:

- Ms Kudzai Nengerai (MELANA Deputy Team Leader)
- Mr Fangel Magabatela (MELANA APT Market Officer)
- Mr Rodney Mushongachiware (MELANA APT Market Linkage Advisor)
- Ms Precious Ndlovu (MELANA Project Coordinator)
- Mr Rapelang Noko (MELANA District Officer)
- Eng Chris Mhlophe (DOI Mat North)
- Eng Tapiwanashe Gumbo (DOI Mat North)
- Ms Sheron Masuku (DAEO Mat South)
- Eng Bezel Garedondo (DOI Mat South)
- Mr Alan Norton (Consultant)

Representatives from DOI and Agritex Matabeleland North were unable to attend the first meeting, so a repeat meeting was held on the same day at their offices in Bulawayo. In attendance were:

- PAEO (Mr Dumisani Nyoni)
- Deputy PAEO (Mr Vukile Mhlangu)
- Prov. Irrigation Engineer (Eng Charles Makhula)
- Deputy (Eng Chris Mhlophe)
- Irrigation Engineer (Eng Tapiwanashe Gumbo)
- Ms Sheron Masuku (DAEO Mat South)
- Eng Bezel Garedondo (DOI Mat South)
- Mr Fangel Magabatela (MELANA APT Market Officer)
- Mr Rodney Mushongachiware (MELANA APT Market Linkage Advisor)
- Mr Alan Norton (Consultant)

2.4 Contacts with Key Stakeholders and Informants

As part of the assessment of targeted irrigation schemes, the Consultant made contact with the key stakeholders/informants listed in Table 2.

Table 2: Key Stakeholders and Informants

Person/Organisation	Position/title	Reason for contact
Eng Edmund Shorai - DOI	Irrigation Specialist	Eng Shorai is in charge of the unit that is capturing and writing up the results of DOI's assessment of selected schemes; to find out to what extent DOI had used the ISI tools and their interest in them.
Eng Piet teVelde	Consultant, Director Bulawayo Projects Centre	Eng teVelde is one of the most experienced consultants on small dams and irrigation schemes in Matabeleland, with a wealth of knowledge and involvement in such schemes. Visited to glean his knowledge and experience on target schemes; verify information in the list of schemes.

Mr Vlanjani Nkomo	Director, Pro-Africa	Pro-Africa have been involved for many years in the development of small holder dams, irrigation schemes and management of catchment areas. Visited to glean any information about the schemes to be assessed, and verify information in the list of schemes.
Mr Thelani Ncube Mr Thulani Ndlovu Mr Josphat Kujinga Mr Ndimande Thabo	DAEO-Esigodini DAEO-Umgusa DAEO-Bubi DAEO-Nkayi	Each of the 4 DAEO's responsible for the 4 target Districts turned out to be the greatest source of verification of information about irrigation schemes, and updating of the list of schemes.
Mr Nkomo, ZESA	District Officer	Following up on debts of irrigators at schemes.
Mr Admire Mlagami, ZINWA	Call Centre Agent	Following up on debts of irrigators at schemes.
Jonas Mutazu, Quest Finances	Agricultural Lending Officer	Following up on debts of irrigators at schemes.
Gerald Zhou, Norman Chagwiza - Inclusive Financial Services	CEO	Following up on debts of irrigators at schemes.

2.5 Development of the Program, Procedures and Processes

A program was developed and continually refined during the assessment. The final version (Annex 3) is attached. Delays were experienced in communications with Government Departments and getting their cooperation and participation, and due to prior commitments of their staff particularly for the Trade Fair (Bulawayo) during the week 24-28 April. This resulted in the program running behind the originally intended timetable.

Two teams were created to expedite the site visits and irrigation scheme assessments. The program allowed for training of the teams, and combined team visits and assessments of the first two schemes (Mzinyathini and Duncal) so as to 'learn by doing' together and ensure consistency of approach and methodology. Each team consisted of a team leader (the consultant led Team 1; Mr Rodney Mushongachiware of APT/MELANA led Team 2) with at least one representative from each of DOI and Agritex in each team. In addition, another APT staff member accompanied the teams for much of the time. The actual officers who participated are listed in Table 1 (Strategic Relationships DOI and Agritex) above.

In order to streamline site visits and ensure that the many preparations, logistics and activities on the ground were carried out, a "Site visit checklist" was drawn up. This also helped to ensure the two teams were working in parallel using the same approach. See Annex 4.

2.6 Site Visits for Irrigation Scheme Assessments

(using ISI tools, FGD, KI's) which included verification of the list of schemes; photos;

Irrigation schemes were assessed using the two tools developed in 2014-15. The two tools used were the "Irrigation Scheme Inventory Form" (ISIF) and "Irrigation Scheme Inventory Focus Group Discussion" (ISIFGD). See Annexes 5 and 6, respectively.

The program for site visits was based on the recommendations from the report on the ISI development. The procedure included initial meetings with DOI staff at their provincial offices to find out information about the schemes, then meeting with the DAEO for each District in turn, to verify the list of irrigation schemes that were eligible for assessment, as well as confirming/correcting details about the schemes themselves.

Schemes were then visited using the list of irrigation schemes (see Annex 1) as a guide. However, with time and in consultation with DOI and Agritex staff, the list was updated with some irrigation schemes being added and some removed as they were found to be in non-target wards or did not fit the assessment criteria. Since the size and situation of each scheme varied considerably, with small schemes often really being a communal vegetable garden, the following two criteria were used to refine the assessment criteria, after consultation with MELANA, Agritex and DOI staff:

Criteria 1: Only assess schemes ≥4ha
Criteria 2: Schemes ≥3ha would be included if they were <60km from Bulawayo.
Criteria 3: Originally a further refinement of limiting assessments to schemes with plot size ≥0.1ha was discussed at the inception meeting, but this was not strictly applied.

At each site a group of farmers was met with for a Focus Group Discussion (using ISIFGD form), followed by a meeting with Key Informants to verify the information and complete the ISIF form which would then become the final version of information gleaned for the assessment. KI's included local Agritex staff who were not part of the assessing team, DAEO's, and post-site visits, contacts made with ZESA, ZINWA and financial institutions.

As part of the assessment, key components of the scheme were visited and where relevant, photographs taken. The FGD was set up before the visit by Agritex staff (who also ensured protocols were in place) where we requested a group of 6-10 farmers meet us consisting of a mixture of males and females, and IMC Committee members as well as ordinary irrigators. Those participating in the FGD were provided with refreshment. A flipchart was used where it proved helpful for farmers to discuss such things as the ranking of importance of crops grown. The response was varied, with sometimes the requisite 6-10 being present, but at other times considerably more people arriving for the FGD. During the visit, GPS coordinates were taken to be included in the ISIF record.

2.7 Development of a Ranking System, Market Opportunities, and Recommendations

The final stage was to develop a ranking system to assist potential investors shortlist potential irrigation schemes. A list of recommendations was also developed for each scheme to further guide potential investors. Finally, the SOW required the Consultant to investigate potential marketing partnerships with the MELANA team.

In exploring the options for developing a ranking system, the Consultant developed the following questions:

- Recognising the number and complexity of the factors that have to be considered in order to make a sound decision on investment and partnering, what information would serve the investor best to make such a considered decision?
- Recognising that the detailed inventory of information has been captured in the survey (Annex 7) and summarised (Annex 8) and is accessible to the investor, how can this be consolidated into a practical ranking system to help decision making?
- What would be the key factors to be included in the ranking system? Which implies: which ones could be left out?
- Which of the key factors would need to be represented as actual information and what could be represented as a colour coded, visual representation for ease of interpretation?
- How can labelling be simplified and clarified?

- Can a weighting system be applied to the various factors under each grouping of factors (e.g. infrastructure) so that a number of factors could be consolidated into a weighted single representation which can be colour coded?

If money is owed, what really is the implication for partnering with the scheme? Does it represent an insurmountable obstacle to a partnership?

Out of this thought process and review of the questions, the following goal of the ranking system was developed:

Goal of ranking system
To provide investors a means to select the most suitable irrigation scheme(s) according to their specific requirements.

It was also decided to design the ranking system to follow and align itself, as far as possible, with the format and order of the Irrigation Scheme Inventory Form, and the summary in Annex 10, for ease of cross-referencing. In addition, to keep the groups of irrigation schemes by District so that it is easy to compare them by geographical area.

The Ranking system was then drafted (see Annex 9) using the above questions with the following interpretations for presentation:

- There is a lot of basic data that needs to be included to identify basic criteria of each scheme – this cannot be oversimplified.
- The basic data has been presented in a sequence that groups similar or related information together, to form a more logical sequence.
- Descriptions have been simplified and key words highlighted in BOLD to help make them stand out and catch the eye.
- Colour coding of the descriptions has been retained for ease of relating back to the Summary sheet.
- Parameter C017 “Condition of drip lines and emitters” was not included in the Ranking system since only one of the 13 schemes assessed (Mbilambowa) had drip irrigation. Details can be reviewed in Annex 7 and 8.
- Average debt (total for the scheme) is included on a per family and per hectare basis as this is believed to be a better measure of the extent of the debt than just a total figure.
- The colour coded ranking was consolidated into 7 areas as follows:
  - Reliability of water supply (using parameters A010, A011)
  - Percentage of scheme currently under irrigation, as an indicator of whether the scheme is currently a going concern (using parameters B006b, B007, B008)
  - Condition of irrigation works: overall condition, condition of reservoir, siltation, condition of in-field works (using parameters C012, C013, C014, C016).
  - Accessibility (based on Distance to Byo, C034, C035, C036).
  - Effectiveness of IMC (D305, D402, D408, D415, D432).
  - Responsible for managing own affairs (D414a, D414b, D506, D507). The premise here being that the more that the irrigators take responsibility for their own affairs, without being reliant on Government or other outsiders, and without outsider interference, the better.
  - Financial status (using the Av. Total debt/ha which is derived in the Basic Information listed above the ranking).

A sheet of assumptions used to derive the ranking forms part of Annex 9. All 13 schemes assessed are included in one sheet but grouped by District, for ease of comparison.

3.0 Irrigation Scheme Assessment Results

3.1 Overview

In March DOI Head Office (Harare) was visited to solicit cooperation, as well as to find out if they had been using the ISI tools. They reported that they had been using the ISIF tool (but not the ISIFGD tool) to assess irrigation schemes ≥5ha in 4 provinces (Manicaland, Matabeleland North and South, Masvingo). By March 2017 more than 260 schemes had been assessed. Their focus was on the infrastructure, for which they had developed their own complimentary survey form. The DOI survey could probably be termed a "rapid assessment" since as many as three schemes were being assessed in a day, an impressive feat considering travel time between schemes. DOI are currently compiling their results into a resource document which includes photographs of infrastructure and Google maps showing scheme layouts. A copy of their complementary assessment for each of Duncal and Mzinyathini (the only two schemes that overlapped with our assessments) are included in the relevant section of Annex 7.

From an initial list of 30 irrigation schemes, of which it was anticipated 20 would be eligible for assessment, only 15 irrigation schemes were visited, once the list of the schemes were revised and eligibility criteria applied (see Table 4). Of the 15, two turned out to be in non-target wards. A partial assessment was done on the latter partly to be polite to the irrigators who had gathered at the request of Agritex, and partly to update the list of irrigation schemes. The schemes are listed in Table 3 below. Figure 1 is a map of Zimbabwe showing the locations of the irrigation schemes that were assessed.

Table 3: Irrigation Schemes Assessed

Province	Matabeleland South	Matabeleland North		
District	Umzingwane	Bubi	Umguza	Nkayi
1	Duncal (Ward 1)	Nkosikazi (Ward 16)	Mpumelelo (Igusi) (Ward 12)	Vukuzenzele (Ward 1)
2	Mabindisa (Ward 2)	Hauke (Ward 16)		Dopota (Ward 1)
3	Mzinyathini (Ward 5)	Kwezomuya (Ward 3)		Fanisoni (Ward 18)
4	Mbilambowa (Ward 6)	Siyatshitsha (Dulutsha) (Ward 2)		Majaha (Ward 19)
5		McKays (Ikhwezi) – *non target* Ward (8)		
6		Indosakusa – *non target* Ward (8)		

Table 4: Irrigation Schemes Assessed – summary statistics

	Umzingwane	Bubi	Umguza	Nkayi	Totals
Total no. of schemes	4	4 (6)	1	4	13 (15)
Potential irrigable area (ha)	52.0	74.5	4.5	37.5	168.5
Current Area being irrigated (ha)	16.0	60.4	0	15.7	92.1

Potential command area (ha)	54.5	80.5	4.5	44.5	184.0

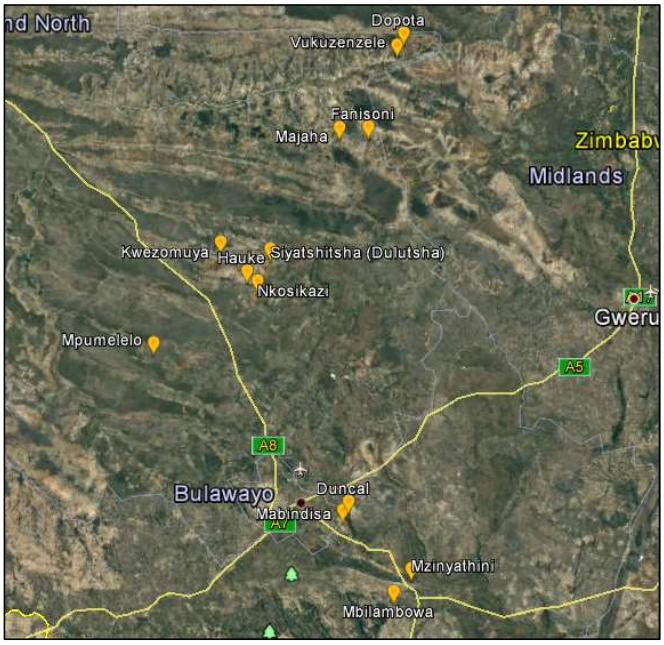

Figure1 Map showing location of irrigation schemes assessed

The completed ISIF and ISIFGD original forms for the schemes assessed are contained in Annex 7, which is a separate A4 lever arch file to accommodate the large number of documents. Copies of the forms have been made and given to MELANA, DOI and Agritex offices in Bulawayo. The results have been summarised from the ISIF forms by District and are contained in Annex 8. Annex 7 and 8 should be used to get a detailed overview of what the schemes.

The results indicate that there is good potential for investors, but the different schemes have varying aspects of attractiveness that a potential investor/partner would need to assess in order to choose which scheme(s) to go with. All schemes would need a greater or lesser degree of work done in terms of building relationship, defining expectations, capacitating IMC and farmers, and investment into infrastructure improvements and inputs, in order to get a viable market linkages partnership operating.

Generally, we enjoyed a high success rate in terms of gathering data to complete the survey forms, however, we were “at the mercy” of the informants, which was demonstrated in us discovering after interviewing irrigators, IMC, and Key Informants, that there were some schemes that had debts but had insisted that they had none. ZINWA, ZESA and financial institutions were followed up with varying degrees of success.

ZINWA were hesitant to provide us as a third party with information about schemes, saying that such a request must come directly from the client. However, they indicated that the only registered irrigation scheme from our target Wards was Fanisoni (Nkayi). The Fanisoni chairperson said their ZINWA arrears were ±$21,000, a figure that Agritex confirmed.

ZESA indicated that most of the accounts from outside of town are opened using names of people like “Nkomo and friends” and are not registered in the name of the irrigation scheme. Thus it is difficult to search in their system using the names of the schemes. They would thus need the account or meter number for the scheme in order to do a search and indicate the outstanding balance.

Financial institutions: there does not appear to be a centralised credit rating bureau in Zimbabwe through which to carry out a search of loans and loan defaulters. However, through personal contacts of APT, two financial institutions were contacted: QUEST Finances, and Inclusive Financial Services (IFS). IFS had outstanding loans from farmers at Duncal ($2,778.00 from 12 out of 53 farmers) and Mzinyathini ($1,509.00 from 3 out of 78 farmers). This does beg the question: what other outstanding loans do irrigators at the different schemes have that they have not voluntarily provided information on, and which we have not uncovered during our investigations?

The revised list of irrigation schemes is contained in Annex 1. Three sheets are included in the file:

- The original list of irrigation schemes provided in the TOR for the consultancy.
- The final (revised) list of schemes in the target Wards, showing the schemes that were assessed.
- The list under (b) but including a number of other non-target schemes – for future reference.

3.2 Results by Scheme

The results by scheme are best reviewed in the following documents:

Annex 1: List of irrigation schemes (especially sheet 2: “Revised list of target schemes”).
Annex 7: ISIF and ISIFGD completed forms. This is a separate A4 lever arch file.
Annex 8: Summary of ISIF results with Ranking.

Comments on individual schemes are also contained in Section 4 Recommendations.

3.3 Scheme Ranking

Figure 2 (based on Annex 11) shows the final ranking of the irrigation schemes assessed. There are seven broad criteria making up the ranking, as indicated in Section 2.7 covering development of the ranking system, and listed again below:

1. Financial status (using the average total debt per ha).
2. Responsible for managing own affairs.
3. Effectiveness of IMC.
4. Accessibility (based on distance to Bulawayo).
5. Condition of irrigation works.
6. Percentage of scheme currently under irrigation (is the scheme operating?).
7. Reliability of water supply.

Some general points to note about this ranking:

- The development of the seven broad criteria gives a good overall “feel” for the priority rating of the schemes and is useful to guide the decision making process.
- *However*, it does not include such basic data as the amount of irrigable land, actual distance from Bulawayo, soil type, prevalence of frost and others. Thus in order to

get a fuller picture, the ranking stacked bar chart must be reviewed in conjunction with the summary of irrigation scheme information contained in Annex 10.

- The effectiveness of IMC (Criteria 3) has possibly the greatest effect on the overall rating of the scheme. It affects the financial status (Criteria 1), responsibility for managing own affairs ((Criteria 2), condition of irrigation works (Criteria 3) since often it is a lack of ownership and maintenance that have led to deterioration, the sum of which can affect the percentage of area currently being irrigated (Criteria 6).
- Each of the seven criteria have been given equal weight, represented by a maximum of 14.3% (equivalent to 100% maximum score for each respective criteria). We have not weighted them since each potential investor will have his or her own considerations which would likely have a different weighting to ours. Hence it is up to the potential investor to give the relevant weight to each criteria.
- Financial status of the schemes: except for Fanisoni, this did not come out as a major issue by virtue of linking the size of the debt to the area of the irrigation scheme, and comparing how this might be offset through production. For example, Duncal's debt worked out at $198/ha, whereas Fanisoni worked out at $1,355/ha. The debt of Duncal was considered not significant as it could be easily recouped in one season with say a tomato crop; whereas that of Fanisoni was considered more significant, although still manageable. There are obviously other considerations like if most of the debt is owed by a few farmers, can the scheme operate if those few farmers are unable to operate?
- Criteria 2: responsible for managing own affairs may not be as a big a problem as it appears (where the score is low) and should be discussed with the irrigators as well as Agritex and any other relevant local authorities.

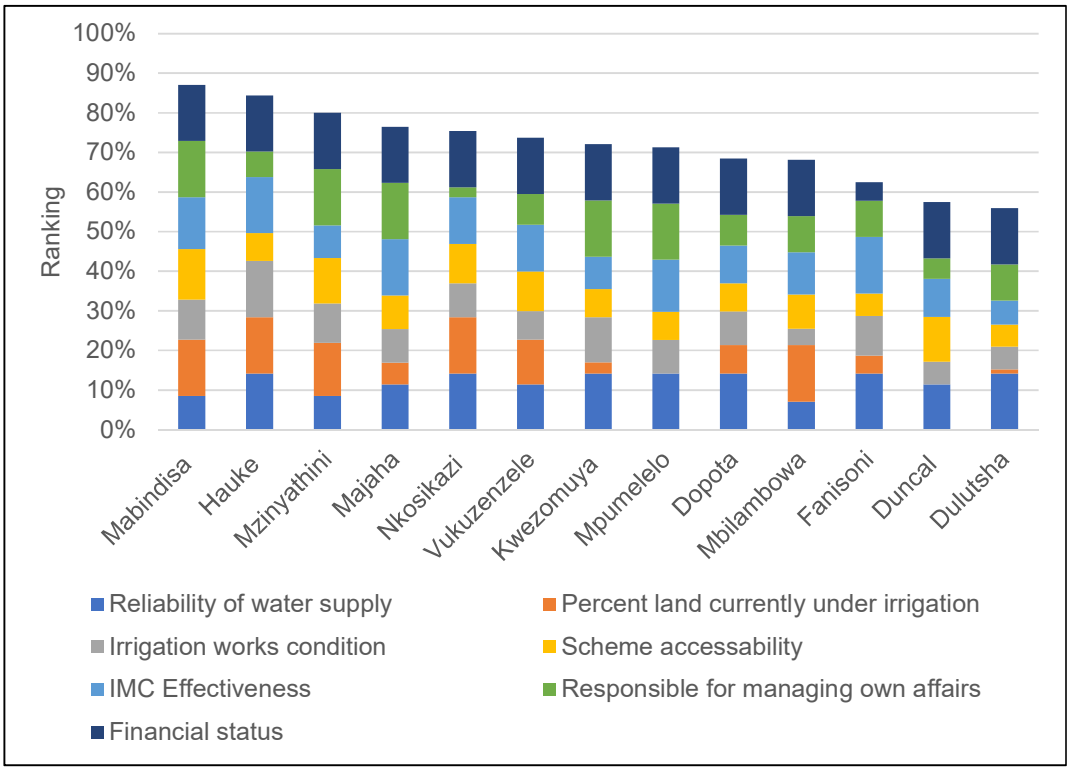

Figure 2 Ranking of schemes according to potential for commercialisation

Some specific points relating to the ranking (using groups with a similar ranking %) are as follows:

- The three highest ranking schemes scoring between 80-87% are Mabindisa (87%), Hauke (84%) and Mzinyathini (80%). Mabindisa and Mzinyathini are stronger than Hauke on responsibility for managing their own affairs and accessibility, but weaker on reliability of water supply and condition of irrigation works. However, the ability to manage ones' own affairs without outside reliance or interference is a relative term, and may not have much significance on Hauke, thus making them an even more attractive investment opportunity. Their relative areas of irrigation are Mabindisa 3.5ha, Hauke 40ha, and Mzinyathini 32ha. This throws a completely different light on each!
- The next group of 5 schemes with ranking in the 77-71% bracket are: Majaha (77%), Nkosikazi (75%), Vukuzenzele (74%), Kwezomuya (72%), and Mpumelelo (71%). Majaha is relatively weak on accessibility from Bulawayo, and irrigation works, the latter affecting the area under irrigation. The latter two do not represent a big challenge to overcome. Nkosikazi scored low on responsibility for managing own affairs. Kwezomuya and Mpumulelo scored low on area currently being irrigated. Mpumulelo could be easily made operational again with the provision of a diesel motor to drive the existing mono pump.
- The next group of three schemes with ranking in the 68-62% bracket are: Dopota (68.5%), Mbilambowa (68.2%) and Fanisoni (62%). Fanisoni's score dropped significantly because of their debt to ZINWA, accessibility from Bulawayo, and the relatively low area currently irrigated. The latter is about to improve as the electric pumps become operational together with the water canon irrigation system.
- The lowest ranking schemes, with rankings of 57 and 56%, respectively, are: Duncal and Dulutsha. The overall score of Duncal is a reflection of poor management and attitude but could be rectified with some investment in the people and bringing vision and direction. It is a scheme with so much potential.

3.4 Discussions with Potential Investors

Representatives of Global Import and Export and Better Agriculture were met with on 11 May 2017 to present the preliminary findings from the irrigation scheme assessments, and discuss options for investment and partnership. As a result, they are currently pursuing training of farmers from Duncal Irrigation Scheme.

4.0 Recommendations

The aim of this section is for the Consultant – based on experience and observations during the scheme assessments - to give recommendations or considerations for potential investors that will guide their decision-making process, as well as the plans for forming the partnership. The section includes general recommendations to guide potential investors in their decision making, specific recommendations on individual schemes (including what it would take to work with the irrigation scheme) and recommendations for future assessments.

4.1 Suggested Guidelines for Potential Investors

The intention of investing in a partnership with a smallholder irrigation scheme is to create a profitable relationship that is win-win for both the investor as well as the irrigators. Under contract farming arrangements the investor creates the market pull.....the irrigators grow the relevant product. But there are numerous considerations. What would be the number one consideration in approaching this subject?

So says the now famous statement of Dr John Maxwell, best-selling author and speaker. It is the Consultant's belief that leadership is the top priority area for consideration, both in terms of what leadership is on the ground at the irrigation scheme, and what leadership is provided by the investor in their relationship with the scheme. A well-organised, motivated, disciplined group of irrigators under good leadership, can do much even with challenging circumstances like limited resources. Conversely, even a technically solid irrigation scheme with access to resources, will likely fail if there is poor leadership on the ground, which is often manifest in the irrigators being unmotivated, disorganised, and lacking in discipline. Good leadership from the investor can help to galvanise the leadership at the scheme into being effective, but it cannot completely replace the lack of good leadership on the ground. Sadly, a recurring observation is that where irrigation schemes have been given much by well-meaning donors, this has created a tendency in the farmers to think that the solution to their problems or challenges has to be solved by someone else's ideas and someone else's money and to be unaware of their own capacity and responsibility to address them. This has led to a culture of disempowerment where irrigators tend to be unmotivated because they lack ownership of their own schemes and circumstances, not realising that they do have resources, knowledge, capacity and thinking to form their own problem solving strategies, rather than waiting for someone else outside their community to do it for them.

The following are the suggested guidelines or considerations for potential investors, in order of priority. Thereafter, Section 4.2 provides notes on the individual irrigation schemes that relate to these priorities, so as to help potential investors in making decisions. These should be read in conjunction with Annex 10 "Summary of ISIF results with Ranking". In addition, Annex 12 contains photos of selected aspects of each irrigation scheme.

Priority 1: **Good leadership**: Is there good leadership, and what is needed to enhance or develop it? This assumes the investor will bring their own good leadership to the relationship. Leadership is usually vested with the Irrigation Management Committee (IMC) who are elected by the irrigators.

By “good leadership” is meant:
They actually do lead, setting direction, showing the way, and leading by example, especially through hard work!
There are accountability structures (scheme bye-laws that give authority to the IMC to enforce rules, which are then actually enforced).
The IMC meet regularly (at least monthly) and their deliberations focus primarily on business directly related to effective running of the scheme. Minutes or notes of meetings are helpful to show the focus and effectiveness of the IMC.
They are managing their funds and being accountable for them as well as any debt the scheme has incurred. Again, records to show this are crucial.

Priority 2: Relationships: Are relationships strong, and what is needed to enhance or develop them?

Africa is a relational continent: relationships are often given a higher priority than business agreements and most dealings. People want to know you value them as a person more than the business deal or formal agreement. In order for an investor to gain success in an irrigation scheme, they will have to work hard on forging good relationships of trust, value of individuals, and mutual accountability. Relationships cannot be taken for granted even when money flows to mutual satisfaction.

Are there any other relationships that could put the partnership at risk? For example, with local authorities, other investors, or issues between the irrigators themselves.

Relationship should also include: developing a formal agreement (MoU or contract) which clearly outlines expectations, deliverables, responsibilities, consequences of breaking agreement, of both parties. Be as clear and straight forward as possible and spend time explaining it!

Priority 3: People building: In what ways would the partnership empower people and strengthen community structures, and what could be done to facilitate this?

This priority relates to Priority 2: Relationships. As much as an investor needs to invest in infrastructure enhancement, inputs, marketing, transport etc., they need to invest in people development. This would include ‘envisioning’, training (specific to crops to be grown, marketing, business planning, financial management, record keeping) as well as encouraging, affirming, building up the people from the scheme through regular visits and interaction.

Priority 4: Farmer investments: What will farmers be required to invest in the partnership?

It is the Consultant’s strongly held view that the irrigators should “come to the party” by putting their own money on the table; and that they should never be given everything (inputs, investment in refurbishment etc.) completely for free. In this way, they become joint winners if the investment goes well, or joint losers if things go wrong. It is amazing how much the fear of loss of one’s own money becomes a motivator towards making a success of the program! Even a loan should be conditional on farmers putting up a reasonable proportion of the money in order to participate. Farmers will always find something if there is a serious plan and opportunity in place.

Priority 5: Geographical, climatic, technical, financial conditions of the scheme: are these appropriate to the investors requirements?

This includes details about the scheme design (area, plot size, water source, number of irrigators), communications (road, cell phone), facilities, environment (Natural Region, soil type, water logging problems, frost), current experience on crops, experience in contracting, financial status. All this information is contained in Annex 8 Summary of ISI results with Ranking.

Priority 6: Focus on high value per unit area: What are the highest value crops that should be promoted under the particular circumstances of the scheme?

It was tragic to see how much irrigated land was being used to grow food security crops (such as grain maize) that have a relatively low return per unit area and are a poor choice on irrigated land. Irrigated land has the potential to deliver high value crops, which would provide the profit margins required to cover costs such as irrigation fees and electricity. Farmers have reasons for their crop choices such as lack of markets for higher value crops and need for food security, and any investor interventions should address this. Even green mealies are not the best option to capitalise on irrigation especially with its high water demand. Irrigators need to be taught what return they can obtain from high value crops (crop budgets), and how only a portion of their profits could be used to purchase the equivalent maize meal that they would have harvested from the same area.

4.2 Recommendations for individual irrigation schemes

4.2.1 Umzingwane District

DUNCAL

Notes: The scheme has not been operating for some years due to lack of water. The IMC and irrigators have not kept up with even basic maintenance of infrastructure (such as keeping canals free of plant growth), let alone more major works such as in-field canals and the scheme fence, and we found them fairly unmotivated and lacking leadership and direction. But there is now good water available and the opportunity to connect the boreholes and bring this scheme back into full production. The main delivery canals, being below ground level, were generally in good condition. However, in-field delivery channels (cement and stone) were very badly damaged through years of neglect and livestock damage, and would need to be replaced, probably at great expense. There are a few other irrigation works that will need some attention.

Recommendations: The proximity of this scheme to Bulawayo (18 km) make it an attractive scheme for commercial partnerships. Leadership, relationship and people building need to be worked on to develop successful partnerships. Irrigators need to invest their own money as part of any partnership. The IMC and irrigators need 'envisioning', and the IMC should be retrained[1] on various committee and leadership skills in order to become more effective. The Consultant's recommendation is that the in-field water channels be replaced by PVC, with a single off-take to each plot with its own filter then drip lines. This then makes the individual irrigator responsible for his own water filtering and maintenance, besides being a much more economical way to use the scarce water at the scheme. This approach is likely to be more cost effectiveness compared to repairing the in-field water channels.

MABINDISA

[1] This assumes that they have had training in the past

Notes: Although this is a small scheme (3.5 ha), it is also close to Bulawayo and we found the irrigators and IMC motivated and organised. Working with them would appear to be a relatively easy partnership to build. The method of flood irrigation appears wasteful, however the water supply appears reliable when compared with the size of scheme. The irrigators felt the scheme could not be expanded in size, but we felt that they could at least add a hectare of land to make it 4.5 ha.

Recommendations: Invest in a high value crop that requires a small area of production. Help the irrigators to instil higher standards of crop husbandry such as plant populations and weed control. In time to replace some of the (small) delivery canal with piping to make it less vulnerable to livestock and breakages.

MZINYATHINI

Notes: This scheme was a gift to the people in 1964 by the City of Bulawayo when they built Umzingwane Dam. It represents a huge potential by virtue of its size (32 ha), reasonable soils and infrastructure. Sadly, there appears to be an absence of ownership of the scheme in terms of maintenance and creating opportunities, perhaps not helped by donor input over the years.

Recommendations: Leadership, relationship and people building need to be developed in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC retrained on various committee and leadership skills in order to be effective. We recommend a change of IMC after refresher training, as new blood could help improve the attitude and forward momentum. Irrigators, through the IMC, need to be encouraged to carry out basic care of the scheme such as grass cutting, fence repairs.

MBILAMBOWA

Notes: This is a small irrigation scheme (2.5 ha) and so represents limited opportunities for investment. The drip system that was installed is not working well, there is no filtration unit, and emitters are blocked. A smaller part of the dam wall was washed away by floods and fixing this small part even by 15cm could help store more water. This could help reduce the periodic water shortages from October to December every year. Farmers at the scheme normally take their produce (Brassicas) to Gwanda or traders come from Gwanda to buy at the scheme.

Recommendations: Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC retrained on various committee and leadership skills in order to be effective. The whole drip system needs to be reworked and filtration unit installed.

4.2.2 Bubi District

NKOSIKAZI

Notes: This is a relatively new scheme (2006) which is operating fairly successfully. The one pump and motor were submerged due to high rainfall during the 2016-17 season and the suction pipe was destroyed and requires attention. Electricity cuts and transformer breakdowns are a challenge. Water is often short towards the end of the dry season. The scheme has a storage shed and a tillage unit (1 tractor, disc harrow) and planter. In the past

the farmers attempted to get into contract farming arrangements to improve their market access. The double pumping arrangement whereby water is first pumped into a night storage dam 4km from the scheme, is not ideal.

Recommendations: Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC retrained on various committee and leadership skills in order to be effective. The replacement of the pumping unit with a solar powered one should be considered in the longer term. Canals need to be maintained and water leaks reduced. Non-perishable crops should be promoted due to the distance and road network to the scheme.

HAUKE

Notes: This is a new scheme (2013) with considerable potential due to its large size (40 ha) and reliable water from the Hauke dam, delivered by underground pipeline. Soils are rich although they were waterlogged during the 2016-17 high rainfall season. Despite its distance from Bulawayo (approximately 120 km) it represents a good opportunity for investment if the right crop(s) can be chosen. The scheme has a tillage unit (2 tractors, disc harrow) and planter serviced by the Department of Mechanisation. The IMC and irrigators appeared motivated and organised.

Recommendations: Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC retrained on various committee and leadership skills in order to be more effective.

KWEZOMOYA

Notes: This scheme is not easily accessible and the irrigators live quite far from it making work in their plots a challenge. Originally installed as a 5 ha scheme, it was reduced to 1 ha when the farmers had trouble with pumping the boreholes. Currently has a bush type hand pump with farmers irrigating by bucket.

Recommendations: Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC retrained on various committee and leadership skills in order to be effective. This scheme could be restored to its original design size but would need careful planning and management to get there.

SIYATSHITSHA (DULUTSHA)

Notes: This is a relatively small scheme (5.5 ha) with only a limited area being irrigated because the diesel pump is not working, and due to the deterioration of sprinklers and irrigation works. Accessibility is not good with the scheme being approximately 125 km from Bulawayo. Most of the scheme founder members are now renting out their plots to other farmers making it very difficult to manage and maintain the scheme with temporal members now forming the majority. Technically there are 2 IMC committees, the original one from the founding members who are no longer active in the scheme, and the one being led by those operating the scheme.

Recommendations: There is need to understand why the original members are renting out and to map a way forward on who has the decision-making powers between those renting

out and those in the scheme. Farmers need to be trained and taught that the assets are theirs and therefore their responsibility; and that they need to save through subscriptions towards the maintenance of the pump, rather than waiting for external assistance when a problem arises. Leadership, relationship and people building need to be worked on in order for a successful partnership

4.2.3 Umguza District

MPUMELELO (IGUSI)

Notes: This is quite an old scheme (1989) and relatively small (4.5 ha), but with decent soils. Sadly, some irrigators ran away with the diesel motor which drives the Mono pump and the scheme has not operated for many years. However, we found the irrigators motivated and keen to get going again.

Recommendations: Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC retrained on various committee and leadership skills in order to be effective. Despite its distance from Bulawayo (approximately 110 km) the scheme has potential for investment and growth of non-perishable crops.

4.2.4 Nkayi District

VUKUZENZELE

Notes: This scheme is remote (237 km from Bulawayo, 100 km from Kwekwe) and only 5 out of 12 ha are being utilised at present. There is no installed infrastructure like water storage facilities and canals, hence farmers are using a bucket system for irrigation on small beds. Mobile network access is poor.

Recommendations: Any market facilitation has to be non-perishable crops and it has to be summer production as the water sources are not perennial. There is need to improve the water sources and channels. Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC retrained on various committee and leadership skills in order to be effective.

DOPOTA

Notes: Potentially an irrigable area of 12 ha, but currently not operating because no fencing to protect the crops from livestock. Scheme was established through an NGO program (WHH). Water for irrigation is supplied through open deep wells in the scheme.

Recommendations: Any market linkage facilitation needs to target non-perishable crops due to distance to markets and the road network. Farmers need to be capacitated in farming as a business and improve ownership and maintenance of community resources like the scheme fencing. Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC retrained on various committee and leadership skills in order to be effective.

FANISONI

Notes: This scheme is a going concern, on the banks of the Shangani River. Currently 5.0 ha flood irrigation from diesel driven pumps, but the scheme is being converted into a 15.5 ha scheme, irrigated by an irrigation gun on hose reel with water supplied by electric pump. The equipment includes a tillage unit (1 tractor, plough, disc harrow) and planter. The scheme owns cattle fattening pens but there has been a dispute on the charges for water so they are currently not operating.

Recommendations: Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC brush retrained on various committee and leadership skills in order to be effective. This could be a high potential partnership worth investing in. Due to location of scheme and road network it would be most ideal for non-perishable crops.

MAJAHA

Notes: This is a small scheme with currently 1.7 out of 3.5 ha (design area) being irrigated. There is water enough and potential to expand to 5.0 ha. The IMC and irrigators appeared motivated and organised and probably relatively easy to form a partnership with.

Recommendations: Leadership, relationship and people building need to be worked on in order for a successful partnership. Irrigators must invest their own money as part of any partnership. The IMC and irrigators need envisioning, and the IMC brush up training (assuming that they have had training in the past) on various committee and leadership skills in order to be effective. Some repairs and maintenance are needed such as a leak by the dam spillway and blockage in the delivery pipeline (probably due to sedimentation).

4.3 Recommendations for future irrigation scheme assessments

It is recommended that the ISI methodology be modified in the following ways:

- Record the ZESA meter numbers for easy follow up on actual debts with ZESA for schemes using electricity.
- Record the water flow meter number for follow up with ZINWA to check on potential outstanding debts on water fees.
- ISIF: it would help to include a question in Section A: “Who was the original designer/constructor of the dam?” This would potentially provide another source of missing information about the scheme e.g. dam catchment area.
- ISIF: after question B006, to add a question: “B006a: What is the current design area of the scheme?”
- ISIF: after question D523, to add a question: “D523a: Does the scheme or irrigators, owe money to any financial institution?”

“D523b: if so, list the name of the financial institutions who are owed money”.

- ISIF: change D524 to: “What is the total ZINWA + ZESA + financial institution debt?”
- ISIF: after question E006, to add questions:

“E006a: Does the irrigation scheme experience frost?” (Answer: Yes, No)
“E006b: If so, on average how many days per year?” (Answer: actual number)

Annex 1: List of Irrigation Schemes

A. List provided in SOW

District	Scheme Name	Ward name / No.	Area irrigated (ha)	Potential Command area (ha)	No. farmers	Water Source	Water supply system	Irrigation system	Remarks	Owner-ship
Bubi	Battlefields	13	0	40	40	Boreholes	Pumping	Sprinkler	Proposed development	
	Canopas		3	3	28	Mine shaft	Pumping, electricity	Drag-hose (with no spr)	The irrigation system shares the pumping unit with the service centre thus disrupting their operations.	
	Dulutsha	7	3.5	3.5	23	Borehole	Pumping, diesel	Sprinkler	Fuel supply problems challenging efficient operation.	
	Fossicker		5	5	25	Borehole	Pumping, diesel	Sprinkler	Requires rehabilitation	
	Hauke	6	0	40	80	Hauke Dam	Gravity	Surface	World Vision Inkosikazi ADP now intervening. Conveyance pipeline material now procured and being installed.	
	Horseshoe		0	15	17	Boreholes	Pumping, electricity	Sprinkler	Scheme rehabilitated under Operation Maguta in 2007.	
	Ikwezi		0	6	14	Boreholes	Pumping, diesel	Surface	The irrigation system was handed over to the farmers before completion because the donor had pulled out.	
	Indosakusa		0	6	14	Boreholes	Pumping, diesel	Surface	The irrigation scheme ceased operating during 2000 when the diesel engine was stolen. The infrastructure is deteriorating due to idlenes.	
	Inkosikazi	2, Nkosikazi	15	23	30	Mbofana weir	Pumping	Surface	Supported by World Vision Inkosikazi ADP.	
	Kwezomuya		0	6	13	Boreholes	Pumping, diesel	Surface	One pumping unit broke down and one borehole collapsed in 2000	
	Mbembeswana	3	2						Requires rehabilitation	
	Mckays		6		30				Requires rehabilitation	
	Pollards	12	0	60	120	Pollards Dam	Gravity	Surface	The irrigation system is under construction. Facing problems on shortage of casual labour for conveyance canal construction and adequate timely funding.	
	Sibonelelo		4	2	16				Requires rehabilitation	Farmer
	Siyatshitsha		2	3	23	Boreholes	Pumping, diesel	Sprinkler	The diesel engine and pump constantly breaks down; hence farmers never get enough pressure	Farmer
Nkayi	Dopota	Mateme, 1	10	12	30	Dam	Gravity	Surface	Scheme was expanded from 6ha to 12ha through funding from German Agro Action	
	Fanisoni	Fanisoni, 18	22	16	60	Shangani River	Pumping, diesel	Surface	High operational cost due to diesel pumping necessitates electrification. Looking for potential funders.	Farmer
Umguza	Alicedale	12	4	30	30	Borehole	Pumping, electricity	Sprinkler and drip	Resettled A1 farmers partially irrigating on existing infrastructure. Scheme requires rehabilitation and training of farmers. Funding is sought.	
	Edwaleni		0	10	12	Borehole	Pumping, electricity	Sprinkler	Scheme requires rehabilitation. Funding is sought.	
	Kahlu		2.5	2.5	30	Borehole	Pumping	Surface	Small scheme whose potential for expansion through further development of water sources is to be explored.	
	Mpumelelo		2	2	10					Farmer
	Thembanani	9	15	45	25	Borehole	Pumping, electricity	Sprinkler	Co-operative farmers who have been in operational since early 90s. Training for farmers reuired. Funding sought for scheme expansion to full potential.	
	Vusanani	9	10	30	12	Borehole	Pumping, electricity	Sprinkler	Co-operative farmers who have been in operational since early 90s. Training for farmers reuired. Funding sought for scheme expansion to full potential.	
Umzingwane	Duncal	1	14		28	Borehole	Pumping	Surface		Joint
	Mziki	6	0						Proposed scheme	Farmer
	Mzinyathini	5	30	30	60	Dam	Pump & gravity	Surface		Joint
	Sewondo		2		17					Farmer
	Thuthukazulu		2		20					Farmer
	Umzimgwani	5	0						Proposed scheme	
	Zimbili		0	140	200	Borehole	Pumping	Sprinkler		

B. Revised list of schemes

	Scheme Name	Ward	Area irrigated (ha)	Potential Command area (ha)	No. farmers	Water Source	Water supply system	Irrigation system	Remarks	Ownership
Bubi	Kwezomuya	3	1	5	11	Boreholes	Bush pump	Surface (bucket)	One pumping unit broke down and one borehole collapsed in 2000	
	Siyatshitsha	2	2	3	23	Boreholes	Pumping, diesel	Sprinkler	The diesel engine and pump constantly breaks down; hence farmers never get enough pressure	Farmer
	Mbembeswana	3	2						Requires rehabilitation	
	Siyatshitsha (Dulutsha)	7	0.4	5.5	23	Borehole	Pumping, diesel	Sprinkler	Fuel supply problems challenging efficient operation.	
	Hauke	16	40	40	80	Hauke Dam	Gravity	Surface	Fully operating.	
	Inkosikazi	16, Nkosikazi	24	30	60	Mbofana weir	Pumping	Surface	Problems with pump	
Nkayi	Dopota	Mateme, 1	12	12	15	Shallow wells	Gravity	Surface	Scheme was expanded from 6ha to 12ha through funding from German Agro Action	
	Fanisoni	Fanisoni, 18	5	15.5	54	Shangani River	Pumping, diesel	Surface[1]	High op costs due to diesel pumping. Currently being electrified. Tillage and planting unit (tractor) available.	Farmer
	Majaha	19	1.7	5	33	Dam	Gravity	Surface		
	Vukuzenzele	1	5	12	15	Open well	Well, Dam	Surface (bucket)		
Umguza	Mpumelelo	12, Igusi	0	4.5	11	Borehole + dam	Diesel pump	Surface	Diesel engine no longer available, but Mono pump still looks serviceable.	Farmer
	Mindora	10	15						Scheme personalised by an individual.	
Umzingwane	Duncal	1	0	14	53	Dam+Borehole	Pumping, gravity NST	Surface	Not functioning at end of 2016 (no water in dam).	Joint
	Thuthukazulu	1	1		20	Dam	Gravity	Surface		Farmer
	Mabindisa	2	3.5	4.5	35	Dam	Gravity	Surface	Operating	Farmer
	Majodwana	4	2.5	2.5	20	Dam	Gravity	Surface	Operating?	Farmer
	Mzinyathini	5	30	32	78	Dam	Gravity	Surface	Good undrgrnd water. Boreholes x2 drilled but not equipped.	Joint
	Mziki	6	1						Proposed scheme – contested land.	Farmer
	Mbilambowe	6	2.5	4	53	Dam	Gravity	Drip	Operating	Farmer
	Malunika	8	2	2		Dam	Gravity	Surface	Operating?	Farmer
	Sewondo	12	1		17	Dam	Gravity	Surface		Farmer
	Zenzeleni	12	10						Planned but not installed.	
	Dabanisa	12	6						Planned but not installed.	
	Matope??	13	3.6	5	21	Dam	Gravity	Surface	Operating	Farmer
	Zinkondweni	3	1.5	1.5	30	Borehole	Pumped solar	Drip	Operating	Farmer
	Emagcekeni	3		75	30	Boreholes to be sunk; river	Pumped solar?	Drip?	Irrigation yet to be installed.	Farmer
	Majodwana	4	2.5	2.5	20	Dam	Gravity	Surface	Operating	Farmer
	Zmrong	6	5	5	12	Mtshabezi dam	Pump	Drip?	Potential scheme	Farmer
	Mlingo	7			23	Dam	Gravity	Surface	Operating? Problems with shared water source.	Farmer
	Mazhowe	11	2	2	20	Dam	Sand abstraction	Surface	Elephant pump currently used	
	Zidlabusuku	12	12	12	24	Mtshabezi dam	Gravity	Drip	In process of being installed.	Farmer
	Mkhayeni	13	1	1	20	Dam	Gravity	Surface	Operating	Farmer

C. Revised list with additional schemes

	Scheme Name	Ward	Area irrigated (ha)	Potential Command area (ha)	No. farmers	Water Source	Water supply system	Irrigation system	Remarks	Ownership	Refs
Bubi	Kwezomuya	3	1	5	11	Boreholes	Bush pump	Surface (bucket)	One pumping unit broke down and one borehole collapsed in 2000		1
	Siyatshitsha	2	2	3	23	Boreholes	Pumping, diesel	Sprinkler	The diesel engine and pump constantly breaks down, hence farmers never get enough pressure	Farmer	1, 3
	Mbembeswana	3	2						Requires rehabilitation		1
	Siyatshitsha (Dulutsha)	7	0.4	5.5	23	Borehole	Pumping, diesel	Sprinkler	Fuel supply problems challenging efficient operation.		1
	Fossicker	8	5	5	25	Borehole	Pumping, diesel	Sprinkler	Requires rehabilitation		1
	Ikwezi	8	0	6	14	Boreholes	Pumping, diesel	Surface	The irrigation system was handed over to the farmers before completion because the donor had pulled out.		1
	Indosakusa	8	0	6	14	Boreholes	Pumping, diesel	Surface	The irrigation scheme ceased operating during 2000 when the diesel engine was stolen. The infrastructure is deteriorating due to idlenes.		1
	Mckays/Ikhwezi	8	6	6	30	Boreholes x3	Pumped	Surface	Requires rehabilitation. Boreholes need pumps.		1
	Canopas	11	3	3	28	Mine shaft	Pumping, electricity	Drag-hose (with no spr)	The irrigation system shares the pumping unit with the service centre thus disrupting their operations.		1
	Pollards	11	40	60	120	Pollards Dam	Gravity	Surface	Scheme now operational.		1
	Sibonelelo	11	4	2	16				Requires rehabilitation	Farmer	1, 3
	Battlefields	13	0	40	40	Boreholes	Pumping	Sprinkler	Proposed development		1
	Hauke	16	40	40	80	Hauke Dam	Gravity	Surface	Fully operating.		1
	Inkosikazi	16	24	30	60	Mbofana weir	Pumping	Surface	Problems with pump		1
	Horseshoe	23	0	15	17	Boreholes	Pumping, electricity	Sprinkler	Scheme rehabilitated under Operation Maguta in 2007. A private individual now taken over the scheme with own terms.		1
Nkayi	Dopota	1	12	12	15	Shallow wells	Gravity	Surface	Scheme was expanded from 6ha to 12ha through funding from German Agro Action		1
	Fanisoni	18	5	15.5	54	Shangani River	Pumping, diesel	Surface	High operational cost due to diesel pumping necessitates electrification. Currently being electrified. Converting to water cannon. Tillage and planting unit (tractor) available.	Farmer	1
	Majaha	19	1.7	5	33	Dam	Gravity	Surface			
	Vukuzenzele	1	5	12	15	Open well	Well, Dam	Surface (bucket)			
Umguza	Thembanani	9	15	45	25	Borehole	Pumping, electricity	Sprinkler	Co-operative farmers who have been in operational since early 90s. Training for farmers required. Funding sought for scheme expansion to full potential.		1
	Vusanani	9	10	30	12	Borehole	Pumping, electricity	Sprinkler	Co-operative farmers who have been in operational since early 90s. Training for farmers required. Funding sought for scheme expansion to full potential.		1
	Alicedale	14	4	30	30	Borehole	Pumping, electricity	Sprinkler and drip	Resettled A1 farmers partially irrigating on existing infrastructure. Scheme requires rehabilitation and training of farmers. Funding is sought.		1
	Edwaleni	9	0	10	12	Borehole	Pumping, electricity	Sprinkler	Scheme requires rehabilitation. Funding is sought.		1
	Kahlu	6	2.5	2.5	30	Borehole	Pumping	Surface	Small scheme whose potential for expansion through further development of water sources is to be explored.		1

	Mpumelelo	12	0	4.5	11	Borehole + dam	Diesel pump	Surface	Diesel engine no longer available, but Mono pump still looks serviceable.	Farmer	3
	Mindora	10	15						Scheme personalised by an individual.		
Umzingwane	Duncal	1	0	14	53	Dam (+Borehole)	Pumping, gravity NST	Surface	Not functioning at end of 2016 (no water in dam).	Joint	1, 2, 3
	Thuthukazulu	1	1		20	Dam	Gravity	Surface		Farmer	3
	Mabindisa	2	3.5	4.5	35	Dam	Gravity	Surface	Operating	Farmer	4
	Majodwana	4	2.5	2.5	20	Dam	Gravity	Surface	Operating?	Farmer	4
	Mzinyathini	5	30	32	78	Dam	Gravity	Surface	Plenty of underground water. Boreholes x2 drilled but not equipped.	Joint	1, 2, 3
	Mziki	6	1						Proposed scheme – contested land.	Farmer	1, 3
	Mbilambowe	6	2.5	4	53	Dam	Gravity	Drip	Operating	Farmer	4
	Malunika	8	2	2		Dam	Gravity	Surface	Operating?	Farmer	4
	Sewondo	12	1		17	Dam	Gravity	Surface		Farmer	
	Zenzeleni	12	10						Planned but not installed.		
	Dabanisa	12	6						Planned but not installed.		
	Matope??	13	3.6	5	21	Dam	Gravity	Surface	Operating	Farmer	4
	Zinkondweni	3	1.5	1.5	30	Borehole	Pumped solar	Drip	Operating	Farmer	5
	Emagcekeni	3		75	30	Boreholes to be sunk; river	Pumped solar?	Drip?	Irrigation yet to be installed.	Farmer	
	Majodwana	4	2.5	2.5	20	Dam	Gravity	Surface	Operating	Farmer	
	Zmrong	6	5	5	12	Mtshabezi dam	Pump	Drip?	Potential scheme	Farmer	
	Mlingo	7			23	Dam	Gravity	Surface	Operating? Problems with shared water source.	Farmer	
	Mazhowe	11	2	2	20	Dam	Sand abstraction (Elephant pump)	Surface			
	Zidlabusuku	12	12	12	24	Mtshabezi dam	Gravity	Drip	In process of being installed.	Farmer	4
	Mkhayeni	13	1	1	20	Dam	Gravity	Surface	Operating	Farmer	

Annex 2: Inception meeting PowerPoint presentation

Matabeleland Enhanced Livelihoods, Agriculture & Nutrition Adaptation (MELANA) Program

Presentation & discussion with key Representatives of:-

- Agritex
- Department of Irrigation DOI
- MELANA Program

WHH/APT Offices, Bulawayo
3 April 2017

1

1. Welcome, Introductions

2

2. Background

- >180 irrigation schemes for smallholder farmers since 1980
- Representing 8,103ha
- 2,000ha in small scale commercial.
- Total = 10,000ha representing massive potential! ($300m in tomatoes)
- But the potential is not being realised
- Many stuck in a cycle of of recurring build, operate, decline and rehabilitation
- World Bank (2013): Rehabilitation needs more than infrastructure refurb – also land tenure, power supplies, input & output market....
- 2014-15 WHH, GIZ + DOI developed methods & tools to assist investors in deciding which schemes represented the right opportunity for them.
- To date DOI have used the ISIF/ISIFGD tools together with their own on Infrastructure assessment to assess >260 schemes in 4 Provinces.

3

3. This Consultancy

- Matabeleland Enhanced Livelihoods, Agriculture and Nutrition Adaptation (MELANA) – UNDP funded 2017-19
- Consortium: WHH, Community Technology Development Organisation ((CTDO), Agricultural Partnerships Trust (APT), Institute of Environmental Studies (IES)
- Development of market linkages: irrigation schemes represent huge opportunity.
- Purpose: assess the schemes using ISI tools, and rank them according to their potential for successful market linkages.

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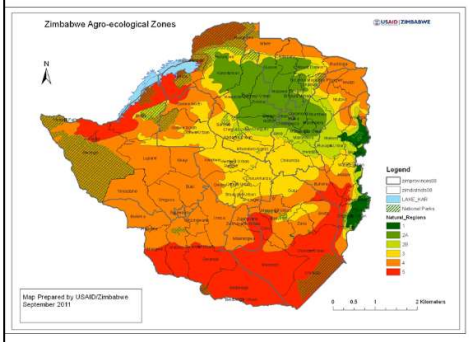
4. Scope

- Districts: Mat N (Nkayi, Bubi, Umguza)
- Mat S: (Umzingwane)
- Selected Wards in each District.
- See Zim map with districts and NR.
- see handout of irrigation schemes

5



6

5. Strategy & Timeframe: your cooperation please!

- ISIF and ISIFGD tools: Triangulate with DOI assessments (3 in Mat S)
- Background info: DOI, Agritex?
- Key Informants (KI's): Agritex, ZINWA, ZESA, RDC, DA
- Irrigators: 6-10 (male + female, IMC representation)
- 2 Teams: Team 1 / Team 2

Team 1	Team 2
Alan	Rod
Agritex x1	Agritex x1
DOI x1	DOI x1

- 1 site per team per day (combined teams for first 2 days)
- Data collection
- Analysis, ranking system, reporting

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Irrigation Scheme Assessment (MELANA) : Proposed Program

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
APRIL	3 Strategy mtg PRO training Duncol scheme	4 Debrief Mzinyathini Debrief	5 Zimbili (1) /Alicedale (2) Debrief	6 Depota + Renkom (1) /Hauke Debrief?	7 Horseshoe (1) /Kwezi Debrief	8	9
	10 Analyse initial data Ranking system developed	11 « ditto »	12	13	EASTER 14	EASTER 15	EASTER 16
	EASTER 17	INDEPENDENCE 18	19	20	21	22	23
	24	25	26	27	28	29	30
MAY	HOLIDAY 1 ISA cont'd	2 ISA cont'd	3 ISA cont'd	4 ISA cont'd	5 ISA cont'd	6	7
	8 ISA Cont'd/write up	9 ISA Cont'd/write up	10 ISA Cont'd/write up	11 ISA Cont'd/write up	12 ISA Cont'd/write up	13	14
	15	16	17	18	19 Submission deadline	20	21
	22	23	24	HOLIDAY 25	26	27	28

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6. Anything else?

- Communication? Whatsapp group?
- Questions, Discussion
- Alan Norton: 0772 602 627
- Thank you!

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Annex 3: Final Work Plan

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
APRIL	**3** Strategy mtg FRO training	**4** Mzinyathi Debrief	**5** Duncal Debrief	**6** Mabindisa (1) Mbilambowe (2) Debrief	**7** Hauke (1) /Inkosikazi (2) Debrief	**8**	**9**
	10 Analyse initial data	**11** = ditto =	**12**	**13**	**14** EASTER	**15** EASTER	**16** EASTER
	17 EASTER	**18** INDEPENDENCE	**19**	**20**	**21**	**22**	**23**
	24	**25**	**26**	**27**	**28**	**29**	**30**
MAY	**1** HOLIDAY Mckays (1) /Indosakusa (2) Debrief	**2** Dulutsha (1 /Kwezomuya (2) Travel to Nkayi? DAEO?	**3** Dopota,Vukuzenzele (2) /Mahaja, Fanisoni (1) Return?	**4** Umgusa-DAEO) - Mpumulelo (Igusi) (1)	**5**	**6**	**7**
	8 ISA Cont'd/write up	**9** ISA Cont'd/write up	**10** ISA Cont'd/write up	**11** ISA Cont'd/write up	**12** ISA Cont'd/write up	**13**	**14**
	15	**16**	**17**	**18**	**19**	**20**	**21**
	22	**23**	**24**	**25** HOLIDAY	**26**	**27**	**28**

ISA = Irrigation Scheme Assessment (1) = Team 1
FRO = Field Research Officer (2) = Team 2

Annex 4: Site visits checklist

DATE & SCHEME

DATE :										
SCHEME :										

(a) Preparations

Protocols have been set up for the areas to be visited.										
Team has been arranged, program communicated.										
Farmers (6-10) arranged to meet our team										
Agritex DAEO, AEW etc arranged to meet us (KII)										
Buy refreshment, biscuits for FGD (12-16 people)										

(b) To take

ISIF, FGD forms, Clipboard										
Flipchart stand, flipcharts, pens										
Folder, pen, pencils, eraser, sharpener.										
Cash, attendance registers, payment claim forms										
Drinks/refreshment, biscuits (for farmers), water										
GPS + batteries										

(c) To do at the scheme

Explain the purpose of visit: fact finding (not donor!)										
FGD										
GPS coordinates										
Visit key aspects of the scheme, make notes, photos (source of water, pumps, night storage dam, canals/distribution network, fields, crops, buildings/sheds, etc).										
KII (or this might be done back at the offices of DAEO etc.)										
Record anything special in the notes at end of forms.										
Express much appreciation!										
Participants register is completed										

Annex 5: ISIF template

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 data base 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 I 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 focus group discussion with farmers.

.

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 data base of Department of Irrigation (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*
  Visit scheduled for _____(date) _____ (Time)
- *On arrival at the irrigation Scheme, introduce yourselves to the local Agritex &/or DOI officers*
  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 (ISIFGD) . Farmer Responses are entered directly on the ISIFGD.*
- *Carry out key informant interview with Agritex and/or DOI officer. Go through each question on the Irrigation scheme Inventory Form (ISIF) 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*
  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 (ISIFGD) record. Submit originals to HEAD OFFICE (????), 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	How many years, in the past 5, was there sufficient water for the summer cropping programme?	|___| years	**KII/ FGD**		
A011	How many years in the past 5 was there sufficient water for the winter cropping programme?	|___| years	**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		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 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		
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 1-5 km of road leading into the scheme	**1**= bad **2**= reasonable **3**= good	KII		
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?	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 6= 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) .

Annex 6: ISIFGD template

Discussion Guide

Irrigation |Scheme Inventory Focus Group Discussion (ISIFGD)

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 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

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?	1= 1 - 25 % 2= 26 - 50% 3= 51 - 75% 4= 76 -100%
D503	B.10 Is the IMC registered with any organisation?	Yes/No
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 NAME 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	C.16 Are a significant number of farmers in debt? If yes, who are farmers in debt to?		

- E60			
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.

Annex 7: ISIF and ISIFGD completed forms

Only available as hard copies

Annex 8: ISIF Data

A. Bubi District

		Nkosikazi Scheme	Hauke Scheme	Kwezomuya Scheme	Siyatshitsha (Dulutsha)
ID	**Survey Question**	**Response**	**Response**	**Response**	**Response**
	A: Water Resources				
A001	What is the primary source of water for this irrigation scheme?	River with weir	Dam	Borehole	Borehole
A002a	Is there a secondary source of water?	No	No	No	No
A002	If yes, what is the secondary source of water?	n/a	n/a	n/a	n/a
A010	How many years, in the past 5, was there sufficient water for the summer cropping programme?	5	5	5	5
A011	How many years, in the past 5, was there sufficient water for the winter cropping programme?	5	5	5	5
A015	What natural agro-ecological zone is the scheme in?	4	4	4	4
A021	What is the catchment area?				
	B: Land Resources				
B001	Location of scheme - Province	Mat North	Mat North	Mat North	Mat North
B002	Location of scheme - District	Bubi	Bubi	Bubi	Bubi
B003	Location of scheme - Wards	Nkosikazi, 16	Nkosikazi, 16	Bemeswana 1, 3	Dulutsha,2
B004	GPS coordinates of scheme	S19°,26.938' E28°,28,775'	S19°,24.929' E028°,26.609'	S19°,19.166' E028°,21.080'	S19°,20.63' E28°,31.51'
B005	What category of land is the scheme on?	Communal	Communal	Communal	Communal
B006	What is the potential scheme command area? (ha)	30	40	5	5.5
	What is the current design area of the scheme? (ha)	24	40	5	5.5
B007	What is the actual scheme irrigated area in the current season in summer? (ha)	24	40	1	0.4
B008	What is the actual scheme irrigated area in the current season in winter? (ha)	24	40	1	0.4
B009	Are all plots the same size?	yes	yes		yes
B010	What is the most common (mode) plot size (ha)?	0.4	0.5	0.09	0.1
B011	What proportions of farmers have the most common plot size?	100%	76-100%	100%	100%
B014	What percentage of the design area is being irrigated?	80%	100%	20%	7%
B015	Is there potential to increase command area?	No	No	Yes	No
	C: Infrastructure				

C001	Name of scheme	Nkosikazi	Hauke	Kwezomuya	Siyatshitsha
C002	How many sections at the scheme?	10	6	3	4
C003	Names of the sections	Blocks 1-10	1,2,3,4,5,6	1,2,3	A,B,C,D
C004	Water delivery system	Pump	Gravity	Bush Pump	Pump
C005	Irrigation system type	Flood/gravity	Flood/gravity	Surface (Bucket)	Spinkler and drag hose
C006	Year of scheme commissioning	2006	2015	1993	1992
C007	Year when farmers started irrigating	2006	2013	1993	1992
C012	Describe the overall condition of the scheme	Mostly sound, needs minor R&M	Sound, no cause for concern	Not sound, extensive R&M required	Not sound, extensive R&M required
C013	What is the condition of the reservoir?	Not sound, extensive R&M required (night storage)	Reservior construction on plan	Sound, no cause for concern	Not sound, extensive R&M required
C014	Are there obvious signs of siltation of the dam, weir and river source?	No	No	No	n/a
C016	Condition of main and infield conveyance system	Ok, needs some R&M to reduce losses	Good, no appreciable losses	n/a	Poor, need major work to rehabilitate
C017	Condition of drip lines and emitters	n/a	n/a	n/a	n/a
C023	How many times has the scheme been rehabilitated since commissioning?	1	0	0	1
C024	What year were system repairs last done?	2010	0	n/a	1999
C034	What is the condtion of the final 1-5km of road leading into the scheme	Reasonable	Reasonable	Bad	Bad
C035	Is there an all-weather road leading to within 5km of the scheme?	Yes	Yes	No	Yes
C036	What is the condition of any bridges leading to the final 1-5km of road leading into the scheme	n/a	Good	n/a	Bad
C037	How many storage sheds are there at the scheme?	1	1	0	1
C040	Describe the cell phone access	Good	Good	Reasonable	Bad
	D: Socio-economics and Management				
D201	Number of irrigating families planned	60	80	20	23
D202	Number of irrigating families current	60	80	10	23
D216	Do any farmers own dry land plots?	Yes	yes	yes	yes
D217	What proportion of farmers own dry land plots?	100%	76-100%	76-100%	100%
D302	Is there an Irrigation Management Committee (IMC)?	yes	yes	yes	yes
D305	How many times were IMC meetings held in the last six months?	2	7	6	0
D402	Is there a constitution available?	yes	yes	yes	yes

D408	Are there by-laws available?	yes	yes	yes	yes
D414a	Who is responsible for the management of the irrigation system?	Gov and farmers	Gov and farmer	Fully Farmer	Fully Farmer
D414b	Who is responsible for the maintance of the system?	Gov and farmers	Gov and farmer	Fully Farmer	Fully Farmer
D415	How well is the IMC operating?	very well	very well	Poorly functioning	Poorly Functioning
D432	What percentage of farmers support the IMC?	100%	100%	1-25%	1%
D503	Is the IMC registered with any organisation?	yes	yes	yes	No
D504	If yes, with what organisation is the IMC registered?	RDC, Agritex	RDC, Agritex, ZRP	Agritex	n/a
D506	Is any outside individual/organisation allowed to instruct the IMC what farmers should do?	yes	yes	no	yes
D507	If yes, which individual/organisation?	Agrtex, RDC		n/a	E.W, Agritex
D514	What is the financial status of the IMC?	in debt	Profitable	Break even	Break even
D522	Does the IMC owe money to ZINWA?	yes	no	no	no
D523	Does the IMC owe money to ZESA?	yes	no	no	no
D524	What is the total ZINWA + ZESA debt?	$4458 (paying off tillage unit)	0	n/a	0
D525	Is there legal water right at level of system or farmer organisation?	Yes	Yes	No	No
D530	Name of IMC Chairman	Donnah Ncube	Mbusi Moyo	Mahlanga Daniel ?	
D531	Cell phone number of IMC Chairman	0716078897	071080874		
D532	Name of IMC vice-chairman	Sibusiso Ncube	Thananani Khabo	Noar Mthethung ?	Sithabile Sithole
D533	Cell phone number of IMC vice-chairman	no phone	0778483959	0774913176	0778 665564
	E: Agricultural Productivity and Marketing				
E001	What is the predominant soil type?	Clay	Clay	Sandy Loam	Clay Loam
E002	What proportion of the area has the predominant soil type?	100%	90%	100%	75%
E006	Is there a problem with waterlogging and drainage?	No	No	Yes	Yes
E009	What proportion of farmers grow two crops per year?	100%	100%	50%	100%
E010	What proportion of farmers grow three crops per year?	100%	10%	50%	30%
E011	What are the three main crops grown in summer?	Maize, sugarbeans, butternuts, vegetables	Maize, sugar beans	Maize, sugar beans	Tomatoes, Beans, Groundnuts
E012	What are the three main crops grown in winter?	Vegetables, onion, carrots	Tomato, onions	Onion, vegetables, tomatoes,	Covo. Onions, Tomatoes

E013	What is the total area of the main THREE crops for the wet (summer) season in the last year (ha)?	24	24	1	0.4
E014	What is the total area of the main THREE crops for the dry (winter) season in the last year (ha)?	24	6	1	0.4
E017	What is the average maize yield at the scheme in the last season? (kg/ha)	0	7000	360	800
E018	What is the average wheat yield at the scheme in the last season? (kg/ha)	0	n/a	n/a	n/a
E019	What is the average sugar bean yield at the scheme in the last season? (kg/ha)	0	2000	n/a	200
E020	What is the average tomato yield at the scheme in the last season? (kg/ha)	0	8000	n/a	400
E032	Which organisation(s) have full time staff present at the scheme?	Agritex - Yes	Agritex - Yes	Agritex - p/t	Agritex - Yes
E033	What is the total number of Agritex staff at the scheme?	1	1	1	1
E035	Have any NGO's supported farmers at the scheme in the past?	yes	yes	yes	yes
E036	If yes, what are the names of the NGO's that have worked at the scheme?	World Vision, SMIDSP	World Vision	World Vision	World Vision
E037	If yes, what was the last year when the last NGO was at the scheme?	2010	2013	1996	1999
E038	If yes, what is the name of the NGO?	SMIDSP	World Vision	World Vision	World Vision
E039	What type of support did the NGO provide to farmers?	Input support, infrastructure support, infrastructure construction	Infrastructure Rehabilitation	Infrastructure Construction, inputs	Extension support, infrastructure construction
E043	What proportion of farmers grows crops for marketing in summer season?	100%	76%	5%	0%
E044	What are the main three crops that are marketed in summer?	Maize, sugar beans	Green mealies		n/a
E043	What proportion of farmers grows crops for marketing in winter season?	100%	76%	5%	100%
E044	What are the main three crops that are marketed in winter?	Brassicas, vegetables, onions	Sugarbeans, tomatoes	Onion, vegetables	Chomolia, onion, tomatoes
E052	Have farmers at the scheme been involved in contract farming?	No	yes	No	No
E053	What is the NAME of the most widespread contracted crop grown in the last 5 seasons?	n/a	Maize	n/a	n/a

E054	What was the biggest area per farmer that was contracted at the scheme for the most widespread crop? (ha)	n/a	0.15	n/a	n/a
E055	What is the NAME of the contract company for this most widespread crop?	n/a	Government	n/a	n/a
E059	Are many farmers in debt?	yes	yes	no	No
E060	Who are the farmers in debt to?	More food programme, ZINWA, ZESA, IMC	IMC	n/a	n/a
	Total value of debt				
	Average number of frost days per year	1-2	4	3	3
	Distance from Bulawayo	110km from Bulawayo, reasonable to poor road	120km from Bulawayo, road fair to poor.	128	125km of fair to poor road from Bulawayo.
	Comments	Motor was submerged during rainy season, so needs drying. Power cuts and breakdowns could be allieviated by solar powered pumping system. Scheme has a tillage unit, 1 tractor, disc harrow, planter. Farmers prefer gravity fed system. They want to do contract farming to allevate makerketing challenges. Blocks 9 and 10 have never been irrigable because canals are of low irrigation.	2 tractors, harrow, planter - serviced by Dept of mechanisation. Gully formation in the irrigation scheme. Harvesting equipment required.	The scheme was orginially installed as a 6ha scheme. When farmers had trouble pumping the boreholes it was reduced to 1ha with a single borehole 'bush' hand pump and hand watering. There is potential to restore original 6ha, but need careful management, envisoning and trainng of farmers. Farmers are scattered far and wide from the scheme.	5km from the nearest main centre. Road is bad. Farmers would prefer Surface system to drag hose.

AJN preliminary rating (5=highly favourable, 1=many challenges to overcome)	3	3.5	1.5	1.5

B. Nkayi District

		Vukuzenzele	Dopota	Fanisoni	Majaha
ID	**Survey Question**	**Response**	**Response**	**Response**	**Response**
	A: Water Resources				
A001	What is the primary source of water for this irrigation scheme?	Open Well	Open Well	River	Dam
A002a	Is there a secondary source of water?	Yes	No	No	No
A002	If yes, what is the secondary source of water?	Dam			
A010	How many years, in the past 5, was there sufficient water for the summer cropping programme?	4	5	5	3
A011	How many years, in the past 5, was there sufficient water for the winter cropping programme?	4	5	5	5
A015	What natural agro-ecological zone is the scheme in?	4	4	4	4
A021	What is the catchment area?				
	B: Land Resources				
B001	Location of scheme - Province	Mat North	Mat North	Mat North	Mat North
B002	Location of scheme - District	Nkayi	Nkayi	Nkayi	Nkayi
B003	Location of scheme - Wards	Mateme, 1	Mateme, 1	Fanisoni, 18	Malindi West, 19
B004	GPS coordinates of scheme	S18°,40.231' E28°,58.481'	S18°,29.81' E28°,59.89'	S18°,56.274' E028°,52.72'	S18°,54.431' E028°,46.238'
B005	What category of land is the scheme on?	Communal	Communal	Communal	Communal
B006	What is the potential scheme command area? (ha)	12	12	15.5	5
	What is the current design area of the scheme? (ha)	5	12	15.5	3.5
B007	What is the actual scheme irrigated area in the current season in summer? (ha)	5	12	5	1.7
B008	What is the actual scheme irrigated area in the current season in winter? (ha)	3	0	5	1
B009	Are all plots the same size?	Yes	Yes	Yes	Yes
B010	What is the most common (mode) plot size (ha)?	0.26	0.4	0.3	0.1
B011	What proportions of farmers have the most common plot size?	100%	100%	76-100%	76-100%

B014	What percentage of the design area is being irrigated?	42%	0%	60%	49%
B015	Is there potential to increase command area?	Yes	Yes	Yes	Yes
	C: Infrastructure				
C001	Name of scheme	Vukuzenele	Dopota	Fanisoni	Manjaha
C002	How many sections at the scheme?			3	2
C003	Names of the sections			A,B,C	Phase 1, Phase 2
C004	Water delivery system	Bucket	Bucket	Pump	Gravity
C005	Irrigation system type	Surface (bucket)	Gravity	Flood/gravity	Flood/gravity
C006	Year of scheme commissioning			1964	
C007	Year when farmers started irrigating			1964	
C012	Describe the overall condition of the scheme	Not sound, extensive R&M required	Not sound, extensive R&M required	Mostly sound, but needs minor R&M	Mostly sound, but needs minor R&M
C013	What is the condition of the reservoir?	Not sound, extensive R&M required	Mostly sound, extensive R&M required	Sound, no cause for concern	Mostly sound, but needs minor R&M
C014	Are there obvious signs of siltation of the dam, weir and river source?	No	n/a	Yes	Yes
C016	Condition of main and infield conveyance system	n/a	n/a	Ok, needs some R&M to reduce loses	Ok, needs some R&M to reduce loses
C017	Condition of drip lines and emitters	n/a	n/a	n/a	n/a
C023	How many times has the scheme been rehabilitated since commissioning?			0	1
C024	What year were system repairs last done?			2014	2016
C034	What is the condtion of the final 1-5km of road leading into the scheme	Reasonable	Bad	Reasonable	Reasonable
C035	Is there an all-weather road leading to within 5km of the scheme?	Yes	Yes	No	Yes
C036	What is the condition of any bridges leading to the final 1-5km of road leading into the scheme	Good	Reasonable	Bad	n/a
C037	How many storage sheds are there at the scheme?	0	0	0	0
C040	Describe the cell phone access	Bad	Bad	Good	Reasonable
	D: Socio-economics and Management				
D201	Number of irrigating families planned	15	15	54	60
D202	Number of irrigating families current	15	0	53	33
D216	Do any farmers own dry land plots?	Yes	Yes	Yes	Yes
D217	What proportion of farmers own dry land plots?	100%	100%	76-100%	76-100%

D302	Is there an Irrigation Management Committee (IMC)?	Yes	Yes	Yes	Yes
D305	How many times were IMC meetings held in the last six months?	3	0	24	6
D402	Is there a constitution available?	Yes	Yes	Yes	Yes
D408	Are there by-laws available?	Yes	Yes	Yes	Yes
D414a	Who is responsible for the management of the irrigation system?	Fully farmer	Fully farmer	Gov/farmer	Fully farmer
D414b	Who is responsible for the maintance of the system?	Fully farmer	Fully farmer	Gov/farmer	Fully farmer
D415	How well is the IMC operating?	Reasonably well	Poorly functioning	Very well	Very well
D432	What percentage of farmers support the IMC?	100%	100%	76-100%	76-100%
D503	Is the IMC registered with any organisation?	No	Yes	Yes	Yes
D504	If yes, with what organisation is the IMC registered?	n/a	ZFU	Agritex, DA, PSC, ZRP, Trad.leadership	RDC,DA,ZRP, Agritex, trad.leadership
D506	Is any outside individual/organisation allowed to instruct the IMC what farmers should do?	Yes	yes	No	No
D507	If yes, which individual/organisation?	Agritex, GAA/WHO (2012)	Agritex, ZFU, WHH		n/a
D514	What is the financial status of the IMC?	Break even	Break even	In debt	Break even
D522	Does the IMC owe money to ZINWA?	No	No	Yes	No
D523	Does the IMC owe money to ZESA?	No	No	No	No
D524	What is the total ZINWA + ZESA debt?	0	0	21000	0
D525	Is there legal water right at level of system or farmer organisation?	No	No	No	No
D530	Name of IMC Chairman	Alex Nyathi	Lady Ncube	Rosaline Masipa	King Ncube
D531	Cell phone number of IMC Chairman	0175912320	0776 712869	0777729606	0713914612
D532	Name of IMC vice-chairman	Leonard Ndebele	Ellen Sithole	Steven Ncube	Sakhile Muvu
D533	Cell phone number of IMC vice-chairman	0785216900			
	E: Agricultural Productivity and Marketing				
E001	What is the predominant soil type?	Clay loam	Clay loam	Clay loam	Loam
E002	What proportion of the area has the predominant soil type?	60%	100%	100%	100%
E006	Is there a problem with waterlogging and drainage?	Yes	Yes	No	No
E009	What proportion of farmers grow two crops per year?			100%	100%

E010	What proportion of farmers grow three crops per year?			0	0
E011	What are the three main crops grown in summer?	Green mealies, onions, brassicas	Tomatoes, green mealies, onions	Maize, veg, potatoes	Maize, Sugar beans, tomatoes
E012	What are the three main crops grown in winter?	Wheat, brassicas, onions	Wheat, brassicas, onions	Maize,tomatoes, onions	Wheat, Onion, Carrots
E013	What is the total area of the main THREE crops for the wet (summer) season in the last year (ha)?		0	15	1.7
E014	What is the total area of the main THREE crops for the dry (winter) season in the last year (ha)?		0	12.5	1
E017	What is the average maize yield at the scheme in the last season? (kg/ha)		0	4000	600
E018	What is the average wheat yield at the scheme in the last season? (kg/ha)		0	3500	750
E019	What is the average sugar bean yield at the scheme in the last season? (kg/ha)		0	0	300
E020	What is the average tomato yield at the scheme in the last season? (kg/ha)		0	200	
E032	Which organisation(s) have full time staff present at the scheme?	None	None	Agritex	None
E033	What is the total number of Agritex staff at the scheme?	0	0	1	0
E035	Have any NGO's supported farmers at the scheme in the past?		Yes	No	Yes
E036	If yes, what are the names of the NGO's that have worked at the scheme?		WHH	n/a	German Agro Africa, Pro Africa, Christian Care
E037	If yes, what was the last year when the last NGO was at the scheme?		2012	n/a	2010
E038	If yes, what is the name of the NGO?			n/a	German Agro Africa
E039	What type of support did the NGO provide to farmers?			n/a	Extension support, tools and equipment
E043	What proportion of farmers grows crops for marketing in summer season?	100%	100%	76-100%	76-100%
E044	What are the main three crops that are marketed in summer?	Green mealies, onions, tomatoes	Green mealies, tomatoes, onions	Maize, veg, potatoes	Vegetables, tomatoes
E043	What proportion of farmers grows crops for marketing in winter season?	100%	100%	76-100%	26-50%
E044	What are the main three crops that are marketed in winter?	Wheat, brassicas, onions	Wheat, brassicas, onions	Wheat, veg, tomatoes	Wheat
E052	Have farmers at the scheme been involved in contract farming?	No	No	Yes	Yes

E053	What is the NAME of the most widespread contracted crop grown in the last 5 seasons?	n/a	n/a	Maize	Garlic
E054	What was the biggest area per farmer that was contracted at the scheme for the most widespread crop? (ha)	n/a	n/a	15	0.1
E055	What is the NAME of the contract company for this most widespread crop?	n/a	n/a	Maguta	?
E059	Are many farmers in debt?	No	No	No	No
E060	Who are the farmers in debt to?	n/a	n/a	n/a	n/a
	Total value of debt				
	Average number of frost days per year	2	2	3	3
	Distance to Bulawayo	244km	246km	174	180
	Comments	Water logging mainly occurs during rainy season and 2/5 of scheme. Maize crop destoryed by army worm this season. 82km to Nkayi Centre, 100km to Kwekwe.	100km to Kwekwe, 85km to Nkayi Centre. Water level too low to use treadle pump in well.	Scheme given Brazil farming equipment including, tractor, planter, disc harrow, hose reel irrigation gun. Transformer available and waiting for installtion, then scheme should be up to expand to the full 15ha. Scheme owns cattle sale pens but no livestock.	Dam spillway wall has leak - probably repairable.Farmers and IMC motivated and organised. Not too difficult to increase 1.7 to 3.5ha. Water probably ok for 5ha.

AJN preliminary rating (5=highly favourable, 1=many challenges to overcome)	2	1.5	4	3.5

C. Umguza District

		Mpumelelo
ID	**Survey Question**	**Response**
	A: Water Resources	
A001	What is the primary source of water for this irrigation scheme?	Borehole
A002a	Is there a secondary source of water?	No
A002	If yes, what is the secondary source of water?	n/a
A010	How many years, in the past 5, was there sufficient water for the summer cropping programme?	5
A011	How many years, in the past 5, was there sufficient water for the winter cropping programme?	5
A015	What natural agro-ecological zone is the scheme in?	4
A021	What is the catchment area?	
	B: Land Resources	
B001	Location of scheme - Province	Mat North
B002	Location of scheme - District	Umguza
B003	Location of scheme - Wards	12
B004	GPS coordinates of scheme	S19°,39.031' E028°,06.812'
B005	What category of land is the scheme on?	Communal/resettled
B006	What is the potential scheme command area? (ha)	4.5
	What is the current design area of the scheme? (ha)	4.5
B007	What is the actual scheme irrigated area in the current season in summer?(ha)	0
B008	What is the actual scheme irrigated area in the current season in winter? (ha)	0
B009	Are all plots the same size?	n/a
B010	What is the most common (mode) plot size (ha)?	n/a
B011	What proportions of farmers have the most common plot size?	n/a
B014	What percentage of the design area is being irrigated?	0
B015	Is there potential to increase command area?	yes
	C: Infrastructure	
C001	Name of scheme	Mpumelelo
C002	How many sections at the scheme?	3
C003	Names of the sections	0
C004	Water delivery system	Pump
C005	Irrigation system type	Flood/gravity
C006	Year of scheme commissioning	1989
C007	Year when farmers started irrigating	1989

C012	Describe the overall condition of the scheme	Not sound, extensive R&M required
C013	What is the condition of the reservoir?	Sound, no cause for concern
C014	Are there obvious signs of siltation of the dam, weir and river source?	no
C016	Condition of main and infield conveyance system	Poor, need major work to rehabilitate
C017	Condition of drip lines and emitters	n/a
C023	How many times has the scheme been rehabilitated since commissioning?	20
C024	What year were system repairs last done?	2007
C034	What is the condtion of the final 1-5km of road leading into the scheme	Bad
C035	Is there an all-weather road leading to within 5km of the scheme?	Yes
C036	What is the condition of any bridges leading to the final 1-5km of road leading into the scheme	Reasonable
C037	How many storage sheds are there at the scheme?	1
C040	Describe the cell phone access	Good
	D: Socio-economics and Management	
D201	Number of irrigating families planned	11
D202	Number of irrigating families current	11
D216	Do any farmers own dry land plots?	Yes
D217	What proportion of farmers own dry land plots?	76-100%
D302	Is there an Irrigation Management Committee (IMC)?	Yes
D305	How many times were IMC meetings held in the last six months?	6
D402	Is there a constitution available?	Yes
D408	Are there by-laws available?	Yes
D414a	Who is responsible for the management of the irrigation system?	Fully farmer
D414b	Who is responsible for the maintance of the system?	Fully farmer
D415	How well is the IMC operating?	Reasonably well
D432	What percentage of farmers support the IMC?	76-100%
D503	Is the IMC registered with any organisation?	Yes
D504	If yes, with what organisation is the IMC registered?	Agritex, RDC
D506	Is any outside individual/organisation allowed to instruct the IMC what farmers should do?	No
D507	If yes, which individual/organisation?	
D514	What is the financial status of the IMC?	Profitable
D522	Does the IMC owe money to ZINWA?	n/a
D523	Does the IMC owe money to ZESA?	n/a
D524	What is the total ZINWA + ZESA debt?	n/a
D525	Is there legal water right at level of system or farmer organisation?	
D530	Name of IMC Chairman	Norman Sibanda

D531	Cell phone number of IMC Chairman	0775339122
D532	Name of IMC vice-chairman	O.Ngwenya
D533	Cell phone number of IMC vice-chairman	0715856333
	E: Agricultural Productivity and Marketing	
E001	What is the predominant soil type?	Sandy clay loam
E002	What proportion of the area has the predominant soil type?	20%
E006	Is there a problem with waterlogging and drainage?	No
E009	What proportion of farmers grow two crops per year?	n/a
E010	What proportion of farmers grow three crops per year?	n/a
E011	What are the three main crops grown in summer?	n/a
E012	What are the three main crops grown in winter?	n/a
E013	What is the total area of the main THREE crops for the wet (summer) season in the last year (ha)?	n/a
E014	What is the total area of the main THREE crops for the dry (winter) season in the last year (ha)?	n/a
E017	What is the average maize yield at the scheme in the last season?	n/a
E018	What is the average wheat yield at the scheme in the last season?	n/a
E019	What is the average sugar bean yield at the scheme in the last season?	n/a
E020	What is the average tomato yield at the scheme in the last season?	n/a
E032	Which organisation(s) have full time staff present at the scheme?	Agritex
E033	What is the total number of Agritex staff at the scheme?	1
E035	Have any NGO's supported farmers at the scheme in the past?	Yes
E036	If yes, what are the names of the NGO's that have worked at the scheme?	Christian Care
E037	If yes, what was the last year when the last NGO was at the scheme?	1989
E038	If yes, what is the name of the NGO?	
E039	What type of support did the NGO provide to farmers?	Infrastructure Rehabilitation
E043	What proportion of farmers grows crops for marketing in summer season?	n/a
E044	What are the main three crops that are marketed in summer?	n/a
E043	What proportion of farmers grows crops for marketing in winter season?	n/a
E044	What are the main three crops that are marketed in winter?	n/a
E052	Have farmers at the scheme been involved in contract farming?	No
E053	What is the NAME of the most widespread contracted crop grown in the last 5 seasons?	n/a
E054	What was the biggest area per farmer that was contracted at the scheme for the most widespread crop? (ha)	n/a
E055	What is the NAME of the contract company for this most widespread crop?	n/a
E059	Are many farmers in debt?	No
E060	Who are the farmers in debt to?	n/a
	Total value of debt	

	Average number of frost days per year	1
	Distance to Bulawayo	110
	Comments	Agritex worker started in 2012, when scheme was already not functioning, so could not clarify issues realted to cropping. Scheme used to operate as a cooperative, so noone owned an individual plat, but currently farmers are using small plots where they manually pump water from borehole.

AJN preliminary rating (5=highly favourable, 1=many challenges to overcome)	3

D. Umzingwane District

		Duncal	Mabindisa	Mzinyathini	Mbilambowa
ID	**Survey Question**	**Response**	**Response**	**Response**	**Response**
	A: Water Resources				
A001	What is the primary source of water for this irrigation scheme?	Dam	Dam	Dam (Umzingwane Dam - Byo city)	Dam
A002a	Is there a secondary source of water?	Yes	No	No	No
A002	If yes, what is the secondary source of water?	Borehole	n/a	n/a	n/a
A010	How many years, in the past 5, was there sufficient water for the summer cropping programme?	4	3	1	0
A011	How many years, in the past 5, was there sufficient water for the winter cropping programme?	4	3	5	5
A015	What natural agro-ecological zone is the scheme in?	4	4	4	4
A021	What is the catchment area?				
	B: Land Resources				
B001	Location of scheme - Province	Mat South	Mat South	Mat South	Mat South
B002	Location of scheme - District	Umzingwane	Umzingwane	Umzingwane	Umzingwane
B003	Location of scheme - Wards	Sigola, 1	Siphezini, 2	Mawabeni, 5	Sibona, 6
B004	GPS coordinates of scheme	S 20° 10.743' E 028° 47.659'	S 20°,12.499' E 028°,46.461'	S20° 24' 11.0" E029° 00' 53.0"	S,20°,28.714', E28°,57.161'
B005	What category of land is the scheme on?	Communal	Communal	Communal	Communal
B006	What is the potential scheme command area? (ha)	14	3.5	32	4
	What is the current design area of the scheme? (ha)	14	3.5	32	2.5
B007	What is the actual scheme irrigated area in the current season in summer? (ha)	0	3.5	30	2.5
B008	What is the actual scheme irrigated area in the current season in winter? (ha)	0	3.5	30	2.5
B009	Are all plots the same size?	yes	yes	yes	No
B010	What is the most common (mode) plot size (ha)?	0.25	0.1	0.4	0.06
B011	What proportions of farmers have the most common plot size?	76-100%	76-100%	76-100%	50%

B014	What percentage of the design area is being irrigated?	0	100%	30%	100%
B015	Is there potential to increase command area?	No	No	No	Yes
	C: Infrastructure				
C001	Name of scheme	Duncal	Mabindisa	Mizinyanthini	Mbilambowe
C002	How many sections at the scheme?	1	1	1	1
C003	Names of the sections			n/a	n/a
C004	Water delivery system	Gravity	Gravity	Gravity	Gravity
C005	Irrigation system type	Flood/Gravity	Flood/Gravity	Flood/Gravity	Drip
C006	Year of scheme commissioning	1965	1986	1964	2001
C007	Year when farmers started irrigating	1965	1986	1964	2001
C012	Describe the overall condition of the scheme	Not Sound, extensive R&M required	Mostly sound, but needs minor R&M	Mostly sound, but need minor R&M	Not sound, extensive R&M required
C013	What is the condition of the reservoir?	Mostly sound, needs minor R&M	Mostly sound, but needs minor R&M	Sound, no cause for concern	Not sound, extensive R&M required
C014	Are there obvious signs of siltation of the dam, weir and river source?	yes	No	yes	yes
C016	Condition of main and infield conveyance system	Poor, needs major work	Ok, need some R&M to reduce loses	Ok, need some R&M , but need reduce losses	Poor, need major work to rehabilitate
C017	Condition of drip lines and emitters	n/a	n/a	n/a	Poor, need major work to rehabilitate
C023	How many times has the scheme been rehabilitated since commissioning?	3	0	2	0
C024	What year were system repairs last done?	1990	n/a	2010	0
C034	What is the condtion of the final 1-5km of road leading into the scheme	Reasonable	Reasonable	Reasonable	Bad
C035	Is there an all-weather road leading to within 5km of the scheme?	Yes	Yes	Yes	No
C036	What is the condition of any bridges leading to the final 1-5km of road leading into the scheme	Reasonable	Good	n/a	n/a
C037	How many storage sheds are there at the scheme?	1	0	1	0
C040	Describe the cell phone access	Good	Good	Good	Reasonable
	D: Socio-economics and Management				
D201	Number of irrigating families planned	53	35	81	53
D202	Number of irrigating families current	1	35	78	53
D216	Do any farmers own dry land plots?	yes	yes	yes	yes
D217	What proportion of farmers own dry land plots?	76-100%	76-100%	75-100%	100%

D302	Is there an Irrigation Management Committee (IMC)?	yes	yes	yes	yes
D305	How many times were IMC meetings held in the last six months?	1	12	3	2
D402	Is there a constitution available?	Yes	yes	Yes	yes
D408	Are there by-laws available?	Yes	yes	Yes	yes
D414a	Who is responsible for the management of the irrigation system?	Gov and farmer	Fully Farmer	Fully farmer	Fully farmer
D414b	Who is responsible for the maintance of the system?	Fully Farmer	Fully Farmer	Fully farmer	Fully farmer
D415	How well is the IMC operating?	Poorly functioning	Reasonably well	Reasonably well	Reasonably well
D432	What percentage of farmers support the IMC?	76-100%	76-100%	76-100%	100%
D503	Is the IMC registered with any organisation?	No	yes	yes	No
D504	If yes, with what organisation is the IMC registered?	n/a	RDC	Agritex	n/a
D506	Is any outside individual/organisation allowed to instruct the IMC what farmers should do?	Yes	No	no	yes
D507	If yes, which individual/organisation?	Chief, RDC	n/a	n/a	RDC
D514	What is the financial status of the IMC?	Break even	Profitable	in debt	In debt
D522	Does the IMC owe money to ZINWA?	No	No	no	No
D523	Does the IMC owe money to ZESA?	No	No	no	No
D524	What is the total ZINWA + ZESA debt?	0	0	0	0
D525	Is there legal water right at level of system or farmer organisation?	No	No	Yes	No
D530	Name of IMC Chairman	Vinola Ndlovu	Dr Moyo	Omriye Ncube	Themba Moyo
D531	Cell phone number of IMC Chairman	0717008108		0712914720	0773209444
D532	Name of IMC vice-chairman	Geneva Ngwenya	Ethel Mpofu	Methuseli Mpofu	Elphas Zikhali
D533	Cell phone number of IMC vice-chairman	0774407505		0784706166	0775869099
	E: Agricultural Productivity and Marketing				
E001	What is the predominant soil type?	Clay-loam	Clay-loam	Sandy	Sandy loam
E002	What proportion of the area has the predominant soil type?	80%	100%	75%	100%
E006	Is there a problem with waterlogging and drainage?	No	No	Yes	No
E009	What proportion of farmers grow two crops per year?	80%	100%	100%	100%
E010	What proportion of farmers grow three crops per year?	20%	100%	20%	100%

E011	What are the three main crops grown in summer?	Maize, G/nuts, Sugarbeans	Maize, potato, Butternut	Maize, Sugarbeans, G/nuts, Kale	Maize, Peas, Brassicas, Tomatoes
E012	What are the three main crops grown in winter?	Garlic, Cabbage, Char Molier	Garlic, onion, peas	Wheat, Kale, Garlic	Wheat, Peas, Brassicas
E013	What is the total area of the main THREE crops for the wet (summer) season in the last year (ha)?	0	3.5	16	2.5
E014	What is the total area of the main THREE crops for the dry (winter) season in the last year (ha)?	0	3.5	30	2.5
E017	What is the average maize yield at the scheme in the last season? (kg/ha)	0	6000	6000	
E018	What is the average wheat yield at the scheme in the last season? (kg/ha)	0	3000	3000	
E019	What is the average sugar bean yield at the scheme in the last season? (kg/ha)	0	2000	2000	
E020	What is the average tomato yield at the scheme in the last season? (kg/ha)	0	n/a	n/a	
E032	Which organisation(s) have full time staff present at the scheme?	Agritex - No, Dept of irrigation - No, PVT Sector - No, NGO - No, Other - No	Agritex - No, Dept of irrigation - No, PVT Sector - No, NGO - No, Other - No	Agritex - No, Dept of irrigation - No, PVT Sector - No, NGO - No, Other - No	Agritex - No, Dept of irrigation - No, PVT Sector - No, NGO - No, Other - No
E033	What is the total number of Agritex staff at the scheme?	0	n/a	0	0
E035	Have any NGO's supported farmers at the scheme in the past?	yes	yes	Yes	yes
E036	If yes, what are the names of the NGO's that have worked at the scheme?	World Vision	World Vision	World Vision	ProAfrica, World Vision
E037	If yes, what was the last year when the last NGO was at the scheme?	2010	2010	2010	2010
E038	If yes, what is the name of the NGO?	World Vision	World Vision	World Vision	World Vision
E039	What type of support did the NGO provide to farmers?	Inpur support, Infrastructure support	Extension support, Input support	Input support, Infrastructure Rehabilitation	Infrastructure construction
E043	What proportion of farmers grows crops for marketing in summer season?	76-100%	76-100%	76-100%	25%
E044	What are the main three crops that are marketed in summer?	Green maize, G/nuts, Sugarbeans	Maize, potato, Butternut	Rape, Onion, Garlic	Green Mealies, Peas, Brassicas
E043	What proportion of farmers grows crops for marketing in winter season?	76-100%	76-100%	75-100%	25%
E044	What are the main three crops that are marketed in winter?	Garlic, Cabbage, Char Molier	Garlic, onion, peas	Rape, Onion, Garlic	Onion, Brassicas, Peas
E052	Have farmers at the scheme been involved in contract farming?	Yes	No	Yes	No

E053	What is the NAME of the most widespread contracted crop grown in the last 5 seasons?	Garlic	n/a	Garlic	n/a
E054	What was the biggest area per farmer that was contracted at the scheme for the most widespread crop? (ha)	0.08	n/a	0.2	n/a
E055	What is the NAME of the contract company for this most widespread crop?	P. Abbot	n/a	Bulawayo Project Centre	n/a
E059	Are many farmers in debt?	No	No	yes	yes
E060	Who are the farmers in debt to?	Inclusive Financial Services	n/a	Inclusive Financial Services	RDC
	Total value of debt	2778		1509	
	Average number of frost days per year	4	8		2-4
	Distance from Bulawayo	18km from Bulawayo on Esgodini rd, 9km gravel.	15	50km from Bulawayo on main tar road + 3km gravel	70
	Comments	Investigate converting to drip, to use water sparingly, even to use boreholes. DOI/GoZ planning to move away from IS having constitution and bye-laws to a DOI policy governing all schemes. There is a smaller dam that which augment water supply, but needs rehab. Stream running through canal damages it in rainy season.	Replace Canal with pipe line.		
	AJN preliminary rating (5=highly favourable, 1=many challenges to overcome)	2.5	4	2.5	2.5

Annex 9: Scheme Ranking Criteria

	ID			Score
Irrigation works condition: overall, reservoir, siltation, in-field [C012, C013, C014, C016]	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	3 2 1 0
	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	3 2 1 0
	C014	Obvious signs of siltation	Yes No	0 1
	C016	Condition of in field 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	3 2 1
			Max score = denominator	10
Accessability [Distance to Byo, C034, C035, C036]	(new)	Distance to Byo	0-50 km 50-100 km >100km	3 2 1
	C034	Condition of final 1-5km of road	Bad Reasonable Good	1 2 3
	C035	Presence of all-weather road	Yes No	1 0
	C036	Condition of bridges	Bad Reasonable Good	1 2 3
			Max score = denominator	10
Effectiveness of IMC [D305, D402, D408, D415, D432]	D305	Frequency IMC meetings in past 6 months.	≤ 2 times 3-4 times ≥ 4 times	1 2 3
	D402	Constitution available?	Yes No	1 0
	D408	Bye-laws available?	Yes No	1 0
	D415	How well is the IMC operating?	Poorly Reasonably Very well	1 2 3
	D432		1-25%	1

		What % of farmers support the IMC?	26-50% 51-75% 76-100%	2 3 4
			Max score = denominator	12
Responsible for managing own affairs [D414a, D414b, D506, D507]	D414a	Who is responsible for management of the irrigation system?	1= Fully farmer 2= fully government 3= Government & farmer 4= other(specify)	3 0 1 1
	D414b	Who is responsible for maintenance of the system?	1= Fully farmer 2= fully government 3= Government & farmer 4= other(specify)	3 0 1 1
	D506	Potential outside directives	Yes No	0 2
	D507	No. of external organisations who can give directives.	None One ≥ 2	3 1 0
			Max score = denominator	11
Financial status [Av. Total debt/ha] Based on the ability to repay the debt through a single crop of tomatoes with a gross margin of $10,000/ha; and using a conservative % of the gross margin.		Av. Debt/ha as a % of the Gross Margin of tomatoes.	<5% = <$500/ha 5-10% = $500-$1,000 >10% = >$1,000	3 2 1

Annex 10: Summary data used in scheme ranking

A. Umzingwane District

ID	Survey Question	Unit	Duncal	Mabindisa	Mzinyathini	Mbilambowa
	Distance from Bulawayo (km)	km	18	14	50	70
A001	Primary **source of water**		Dam	Dam	Umzingwane Dam	Dam
C004	Water **delivery** system		Gravity	Gravity	Gravity	Gravity
C005	**Irrigation system** type		Flood/Gravity	Flood/Gravity	Flood/Gravity	Drip
C037	No. of **storage sheds**		1	0	1	0
C040	**Cell phone** access		Good	Good	Good	Reasonable
B005	**Land** category		Communal	Communal	Communal	Communal
B006	Current scheme design **area** (ha)	ha	14	3.5	32	2.5
B014	Percentage of area being **irrigated** at time of survey (%)	%	0%	100%	30%	100%
B010	Most common **plot size** (ha)	ha	0.25	0.1	0.4	0.06
D201	Number of irrigating **families** - planned		53	35	81	53
D202	- current		1	35	78	53
D525	**Water right**: Is there a legal one at level of system or farmer org?		No	No	Yes	No
A015	**Natural region**		4	4	4	4
E001	**Soil** type (predominant)		Clay-loam	Clay-loam	Sandy	Sandy loam
E006	**Water logging & drainage**: is there a problem?		No	No	Yes	No
	Frost days per year (estimated)		4	8	0	2-4
E011	Main **crops grown** - summer		MZE, GNT SBN	MZE, PTO, BNT	MZE, SBN, GNT, KLE	MZE, PEA, BSC, TTO
E012	- winter		GLC, CBG, CMR	GLC, ONI, PEA	WHT, KLE, GLC	WHT, PEA, BSC
E044	Main **crops marketed** - summer		GMZ, GNT, SBN	MZE, PTO, BNT	RAP, ONI, GLC	GMZ, PEA, BSC
E044	- winter		GLC, CBG, CMR	GLC, ONI, PEA	RAP, ONI, GLC	ONI, BSC, PEA
E053	Most **widespread crop marketed**		Garlic	n/a	Garlic	n/a
E055	**Contract company** for the most widespread crop marketed		P. Abbot	n/a	Bulawayo Project Centre	n/a
E037	Last **NGO** involved at the scheme - year		2010	2010	2010	2010
E038	- name of NGO		World Vision	World Vision	World Vision	World Vision
D514	IMC - **financial status** (according to FGD)		Break even	Profitable	in debt	In debt
D524	- debt owed to **ZINWA + ZESA** (what is known or admitted)		0	0	0	0
	- debt owed to **Financial Institutions** (known debt)		$2,778	$0	$1,509	$0
	- **Av. debt** (total) per **family**		$52	$0	$19	$0
	- **Av. debt** (total) per **ha**		$198	$0	$47	$0

NOTES: BNT=Butternut; BSC=Brassica; CBG=Cabbage; CMR= Char Molier; CRT=Carrot; GLC=Garlic; COV=Covo; GMZ=Green Mealies; GNT=Groundnut; KLE=Kale; MZE=Maize; ONI=Onions; PEA=Peas; PTO=Potato; RAP=Rape; SBN=Sugar beans; TTO=Tomato; VEG=Vegetables; WHT=Wheat

B. Bubi District

ID	Survey Question	Unit	Nkosikazi	Hauke	Kwezomuya	Siyatshitsha (Dulutsha)
	Distance from Bulawayo (km)	km	110	120	130	125
A001	Primary **source of water**		River with weir	Dam	Borehole	Borehole
C004	Water **delivery** system		Pump	Gravity	Bush Pump	Pump
C005	**Irrigation system** type		Flood/gravity	Flood/gravity	Surface (Bucket)	Spinkler and drag hose
C037	No. of **storage sheds**		1	1	0	1
C040	**Cell phone** access		Good	Good	Reasonable	Bad
B005	**Land** category		Communal	Communal	Communal	Communal
B006	Current scheme design **area** (ha)	ha	24	40	5	5.5
B014	Percentage of area being **irrigated** at time of survey (%)	%	80%	100%	20%	7%
B010	Most common **plot size** (ha)	ha	0.4	0.5	0.09	0.1
D201	Number of irrigating **families** - planned		60	80	20	23
D202	- current		60	80	10	23
D525	**Water right**: Is there a legal one at level of system or frmer org?		Yes	Yes	No	No
A015	**Natural region**		4	4	4	4
E001	**Soil** type (predominant)		Clay	Clay	Sandy Loam	Clay Loam
E006	**Water logging & drainage**: is there a problem?		No	No	Yes	Yes
	Frost days per year (estimated)		1-2	4	3	3
E011	Main **crops grown** - summer		MZE, SBN, BNT, VEG	MZE, SBN	MZE, SBN	TTO, SBN, GNT
E012	- winter		VEG, ONI, CRT	TTO, ONI	ONI, VEG, TTO,	Covo. ONI, TTO
E044	Main **crops marketed** - summer		MZE, SBN	GMZ	None	None
E044	- winter		BSC, VEG, ONI	SBN, TTO	ONI, VEG	CMR, ONI, TTO
E053	Most **widespread crop marketed**		n/a	Maize	n/a	n/a
E055	**Contract company** for the most widespread crop marketed		n/a	Government	n/a	n/a
E037	Last **NGO** involved at the scheme - year		2010	2013	1996	1999
E038	- name of NGO		SMIDSP	World Vision	World Vision	World Vision
D514	IMC - **financial status** (according to FGD)		in debt	Profitable	Break even	Break even
D524	- debt owed to **ZINWA + ZESA** (what is known or admitted)		4458	0	n/a	0
	- debt owed to **Financial Institutions** (known debt)		0	0	0	0
	- **Av. debt** (total) per **family**		$74	$0	#VALUE!	$0
	- **Av. debt** (total) per **ha**		$186	$0	#VALUE!	$0

NOTES: BNT=Butternut; BSC=Brassica; CBG=Cabbage; CMR= Char Molier; CRT=Carrot; GLC=Garlic; COV=Covo; GMZ=Green Mealies; GNT=Groundnut; KLE=Kale; MZE=Maize; ONI=Onions; PEA=Peas; PTO=Potato; RAP=Rape; SBN=Sugar beans; TTO=Tomato; VEG=Vegetables; WHT=Wheat

C. Umguza and Nkayi Districts

				UMGUZA		NKAYI DISTRICT			
ID	**Survey Question**	**Unit**		**Mpumelelo**		**Vukuzenzele**	**Dopota**	**Fanisoni**	**Majaha**
	Distance from Bulawayo (km)	km		110		237	239	167	173
A001	Primary **source of water**			Borehole		Open Well	Open Well	River	Dam
C004	Water **delivery** system			Pump		Bucket	Bucket	Pump	Gravity
C005	**Irrigation system** type			Flood/gravity		Surface (bucket)	Gravity	Flood/gravity	Flood/gravity
C037	No. of **storage sheds**			1		0	0	0	0
C040	**Cell phone** access			Good		Bad	Bad	Good	Reasonable
B005	**Land** category			Communal/resttld		Communal	Communal	Communal	Communal
B006	Current scheme design **area** (ha)	ha		4.5		5	12	15.5	3.5
B014	% of area being **irrigated** at time of survey (%)	%		0		42%	0%	60%	49%
B010	Most common **plot size** (ha)	ha		n/a		0.26	0.4	0.3	0.1
D201	Number of irrigating **families** - planned			11		15	15	54	60
D202	- current			11		15	0	53	33
D525	**Water right**: Is there a legal one at level of system or farmer org?			0		No	No	No	No
A015	**Natural region**			4		4	4	4	4
E001	**Soil** type (predominant)			Sandy clay loam		Clay loam	Clay loam	Clay loam	Loam
E006	**Water logging & drainage**: is there a problem?			No		Yes	Yes	No	No
	Frost days per year (estimated)			1		2	2	3	3
E011	Main **crops grown** - summer			n/a		Green mealies, onions, brassicas	Tomatoes, green mealies, onions	Maize, veg, potatoes	Maize, Sugar beans, tomatoes
E012	- winter			n/a		Wheat, brassicas, onions	Wheat, brassicas, onions	Maize,tomatoes, onions	Wheat, Onion, Carrots
E044	Main **crops marketed** - summer			n/a		Green mealies, onions, tomatoes	Green mealies, tomatoes, onions	Maize, veg, potatoes	Vegetables, tomatoes
E044	- winter			n/a		Wheat, brassicas, onions	Wheat, brassicas, onions	Wheat, veg, tomatoes	Wheat
E053	Most **widespread crop marketed**			n/a		n/a	n/a	Maize	Garlic
E055	**Contract company** for the most widespread crop			n/a		n/a	n/a	Maguta	?
E037	Last **NGO** involved at the scheme - year			1989		0	2012	n/a	2010
E038	Name of NGO			0		0	0	n/a	GAA
D514	IMC - **financial status** (according to FGD)			Profitable		Break even	Break even	In debt	Break even
D524	- debt owed to **ZINWA + ZESA** (what is known)			n/a		0	0	21000	0
	- debt owed to **Financial Institutions** (known)			0					
	- **Av. debt** (total) per **family**			#VALUE!		$0	$0	$389	$0
	- **Av. debt** (total) per **ha**			#VALUE!		$0	$0	$1,355	$0

Annex 11: Scheme Rankings

	Umzingwane				Nkayi				Umguza	Bubi			
	Dunc	Mabi	Mzin	Mbil	Nkos	Hau	Kwe	Siya	Mpum	Vuku	Dopo	Fani	Maja
Reliability of water supply[1]	80%	60%	60%	50%	100%	100%	100%	100%	0%	80%	100%	100%	80%
% currently under irrigation[2]	0%	100%	94%	100%	100%	100%	20%	7%	0%	80%	50%	32%	39%
Irrigation works condition[3]	40%	70%	70%	30%	60%	100%	80%	40%	60%	50%	60%	70%	60%
Accessibility[4]	80%	90%	80%	60%	70%	70%	50%	40%	50%	70%	50%	40%	60%
IMC effectiveness [5]	67%	92%	83%	75%	83%	100%	58%	42%	92%	83%	67%	100%	100%
Responsible for managing own affairs[6]	36%	100%	100%	64%	18%	45%	100%	64%	100%	55%	55%	64%	100%
Financial status [7]	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	33%	100%
Overall Ranking[8]	58%	87%	84%	68%	76%	88%	73%	56%	57%	74%	69%	63%	77%

Notes

1. Average of A010 and A011; 75-100%=green; 25-75%=orange; <25%=red
2. Average of summer and winter [B006b, B007, B008]; 75-100%=green; 50-75%=orange; ,50%=red
3. Overall, reservoir, siltation, in-field [C012, C013, C014, C016]; See "Assumptions" sheet. 0-33%=red; 33-66%=orange; 66-100%=green
4. Distance to Bulawayo [C034, C035, C036]; See "Assumptions" sheet. 0-33%=red; 33-66%=orange; 66-100%=green
5. [D305, D402, D408, D415, D432]; See "Assumptions" sheet. 0-60%=red; 60-80%=orange; 80-100%=green
6. [D414a, D414b, D506, D507]; See "Assumptions" sheet. 0-50%=red; 50-75%=orange; 75-100%=green
7. [Av. Total debt/ha-see above]; See "Assumptions" sheet. 33%=red; 67%=orange; 100%=green
8. 0-50%=red; 50-75%=orange; 75-100%=green

Annex 12: Scheme Photos

Duncal Irrigation Scheme, Umzingwane District. Photos: 5 April 2017

Dam – full at time of visit

Night storage reservoir

Main canal: overgrown but sound

In-field channels

In-field channels

Fields with shed in background

Typical field condition

IMC

Scheme location

Arial view of scheme

Mabindisa Irrigation Scheme, Umzingwane District. Photos: 6 April 2017

Supply dam

Fish farming project

Spillway: manageable erosion

Offtake from dam

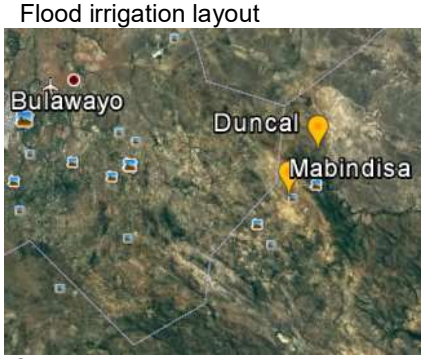
Main supply canal from dam

Distribution channel

Flood irrigation layout

Low standards

IMC + irrigators



Scheme location

Arial view of scheme

Mzinyathini Irrigation Scheme, Umzingwane District. Photos: 4 April 2017

Previous investors

Night Storage Dam

Control box

Outlet

Control box

Typical field

IMC

Scheme location

Scheme layout

Mbilambowa Irrigation Scheme, Umzingwane District. Photos: 6 April 2017

IMC + irrigators

Field layout

In-field works

Field layout

In-field

Vegetable production

Scheme location

Scheme layout

Vukuzenzele Irrigation Scheme, Nkayi District. Photos: 3 May 2017

Open well water source

Water Channel (unlined)

Water Channel (unlined)

In-field

In-field

Scheme location

Scheme layout

Dopota Irrigation Scheme, Nkayi District. Photos: 3 May 2017



Open well water source

Field

Fanisoni Irrigation Scheme, Nkayi District. Photos: 3 May 2017

Piping works from pump station

Piping works from pump station

Diesel pump

Irrigation gun on reel

Planter

Tractor and plough

Disc harrow

Plenty of water from Shangani river

Scheme Layout

Scheme location

Majaha Irrigation Scheme, Nkayi District. Photos: 3 May 2017

Dam (full after rains)

Spillway (silted)

Leak in spillway wall

Leak in spillway wall

In-field channels

In-field channels

IMC + farmers FGD

In field

In field

Scheme layout

Scheme location

Mpumelelo Irrigation Scheme, Umguza District. Photos: 4 May 2017

Untapped dam – minor leak

Mono pump – no diesel drive motor

Reservoir – intact

Main canal – needing repairs

View of main field

Shed

FGD with farmers

Scheme location

Scheme layout

Inkosikazi Irrigation Scheme, Bubi District. Photos: 7 April 2017

Pump house

Pump house

IMC + irrigators

IMC + irrigators

Tillage unit

Scheme location

Scheme layout

Hauke Irrigation Scheme, Bubi District. Photos: 7 April 2017

Hauke Dam

Hauke Dam

Main canal

Control gate

In-field

Fields – weeds!

Tillage unit

Hauke meeting place

Scheme location

Scheme layout

Kwezomuya Irrigation Scheme, Bubi District. Photos: 2 May 2017

Night storage (not in use)

View across current irrigated plot

In-field irrigation by hand

In-field irrigation by hand

In-field irrigation by hand

Farmers FGD

Siyatshitsha/Dulutsha Irrigation Scheme, Bubi District. Photos: 2 May 2017