



Funding and Investment Plan

For the Vaalharts / Taung Irrigation Scheme Revitalisation Project

Document prepared by:

Agrifusion (Pty) Ltd
1 Andringa Street
Stellenbosch
7600

T +27 21 882 9922
E gerhard@agrifusion.co.za
W www.agrifusion.co.za

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Executive summary

Introduction and Background

The Vaalharts / Taung Irrigation Scheme is the largest irrigation scheme in South Africa, and is located in the Northern Cape and the North-West Province. It has approximately 35 302ha of land under irrigation, of which 31 732ha is located within the Northern Cape, and 3 570ha in the North West Province. An additional 2 854ha could be made available to farmers in the Taung area if the North canal of the irrigation scheme is refurbished.

The Vaalharts / Taung irrigation scheme upgrading project has been identified as a key project under Strategic Infrastructure Projects 11 ("SIP11"), due to its capability to boost rural infrastructure, create jobs and sustain the livelihoods of the rural communities in Taung. SIP11 is mandated by the Presidential Infrastructure Coordinating Commission ("PICC"), and coordinated by the National Agriculture Marketing Council ("NAMC"). The project's alignment with SIP11 is a great motivating factor for obtaining grants and/or development funding, which is also the core focus of this business plan. It is against this background that the need for the Vaalharts / Taung irrigation scheme revitalisation project was identified.

The Strategic Water Partners Network ("SWPN"), hosted by the Nepad Business Foundation ("NBF"), contracted Agrifusion to develop a multi-stakeholder funding and investment plan ("FIP") for the Vaalharts / Taung irrigation scheme upgrading project. The basis for investment is the increase in economic and/or social value achieved by re-allocation of water saved on the scheme, due to the upgrading of infrastructure.

The deliverable for the development of a Multi-Stakeholder FIP is in the form of a number of papers with specific topics, which are to be consolidated into a single FIP when completed. This document constitutes the FIP, and is intended to be a summary of the most important items as presented in the papers that have been provided to the SWPN. The inputs of various stakeholders were used in the execution of this study, including the inputs of the Vaalharts Water User Association ("WUA"), Northern Cape Department of Agriculture, Land Reform and Rural Development ("DALRRD"), Department of Rural, Environment and Agricultural Development, North-West ("READ"), Department of Water and Sanitation ("DWS") and the Technical Implementation Committee for the Vaalharts / Taung irrigation scheme upgrading project.

Two stakeholder workshops were hosted by the SWPN and the inputs of key stakeholders were obtained. The workshops took place on 19 October 2015 and 25 November 2015 at Hartswater. All key stakeholders were invited, and attendance was satisfactory.

The most feasible funding option is that the capital required for the revitalisation of the Vaalharts / Taung irrigation scheme will be funded by the Department of Water and Sanitation ("DWS"). Funds could however also be sourced from other Government departments and alternative off-budget sources. The following social and developmental factors could serve as a motivation:

- A large number of municipalities in the Northern Cape and North-West Province are dependent on water from the scheme. Many poor and destitute individuals are reliant on water from the scheme;

- The upgrading of the irrigation scheme includes the extension of the Taung Canal, which would enable the development of additional agricultural production of approximately 2800 ha to emerging farmers. This could have a huge knock-on effect for employment creation and boost the rural economy; and
- The project could be linked with other interventions, e.g. the Agriparks initiative by the DRDLR, to ensure an integrated approach and further boost the rural economy.

The canals of the Vaalharts / Taung Irrigation Scheme are generally in a poor condition and require urgent attention – the concrete lining has become brittle, cracked and has been displaced in some areas. It is estimated that up to 30% of the water allocated in the scheme is lost due to seepage, which occurs in the main canals as well as the secondary and tertiary canals. This causes major problems, including the following:

- The municipal, industrial and agricultural water users are exposed to a low security of water delivery;
- The seepage leads to weak drainage of agricultural soils with the concomitant salinisation (increased salt content) which prevents efficient agricultural production; and
- If the scheme is not rehabilitated, the scenarios for development are very limited - severely detrimental economic, financial, socio-political, water loss and environmental consequences could be expected.

It is against the background provided above that the upgrading of the Vaalharts / Taung irrigation scheme was first proposed in 2008. A lot of work has been done since, and a comprehensive feasibility study for the revitalisation project by Aurecon Group has been performed. This study forms the cornerstone of the recommendations made in this FIP.

The following themes are discussed in this document:

- Roles and responsibilities of stakeholders involved in the scheme;
- Governance structure;
- Funding requirements;
- Implementation strategy; and
- Potential funding sources.

Roles and Responsibilities of Stakeholders involved in the Scheme

There are numerous stakeholders involved in the scheme, as outlined in this report. The roles and responsibilities of stakeholders directly involved in the scheme are elaborated upon below:

- The Department of Water and Sanitation ("DWS") is the asset owner and custodian of the bulk water infrastructure;
- The Vaalharts Water User Association ("WUA") is responsible for maintaining the bulk water infrastructure. A joint venture agreement between the Vaalharts WUA and DWS also exists for emergency upgrade work on the bulk water infrastructure;
- The Department of Agriculture, Forestry and Fisheries ("DAFF") is responsible, through the Department of Agriculture, Land Reform and Rural Development ("DALRRD") and the Department of Rural, Environment and Agricultural Development, North-West ("READ"), to conserve soil condition and support emerging farmers. In particular, DALRRD and READ are responsible to assist with provision of on-farm drainage infrastructure. Further to this the

DALRRD also facilitates other functions within the irrigation scheme revitalisation project through DAFF, e.g. funding of the Environmental Impact Assessment ("EIA") for the project; and

- READ also has a responsibility to assist with planning the agricultural expansions that would follow the extension of the Taung canal (this includes the development of studies and business plans, as well as the procurement of services that may be required).

Governance Structure

DWS is the custodian and asset owner of the bulk water infrastructure. Governance of the project should therefore fall under the DWS to a large extent, and the National Water Act should provide guidance on basic governance principles.

The governance structure of the Vaalharts / Taung irrigation scheme revitalisation project has been determined to a large extent. It comprises the Steering Committee, Technical Committee and Technical Implementation Committee as further outlined below. A dedicated project office has also been set up to manage the day-to-day roll-out of the Vaalharts / Taung irrigation scheme revitalisation project.

During the second stakeholder forum workshop that was held to obtain inputs for the development of this FIP it has been stated that individual committee members stopped attending the meetings, stifling project progress. It has been suggested to reconstitute these committees, and to invite members of the private sector to be included in a consulting capacity. The suggestion is that the public sector individuals provide an oversight function while the private sector individuals assist to perform work that needs to be completed and provide practical assistance and guidance.

Funding Requirements

The project cost for the Vaalharts / Taung irrigation scheme revitalisation project has been identified in the Aurecon (2011) reports. During the second stakeholder forum workshop it was confirmed that an annual escalation of 8% is appropriate to determine updated project costs. The project costs are indicated in the table below.

Infrastructure component	Cost (R m)							
	2011	2012	2013	2014	2015	2016	2017	2018
Main Canals	382.67	413.28	446.35	482.05	520.62	562.27	607.25	655.83
Feeders & furrows	1,831.46	1,977.98	2,136.21	2,307.11	2,491.68	2,691.02	2,906.30	3,138.80
Drains	893.36	964.83	1,042.02	1,125.38	1,215.41	1,312.64	1,417.65	1,531.06
Balancing dams	827.07	893.24	964.69	1,041.87	1,125.22	1,215.24	1,312.46	1,417.45
Project Total (Aurecon)	3,934.56	4,249.33	4,589.27	4,956.41	5,352.93	5,781.17	6,243.66	6,743.14

It is recommended that water users contribute a portion of the infrastructure development cost for the irrigation scheme revitalisation project, proportional to the benefits that accrue to them. Detailed calculations should still be made based on the benefit received by each water user. Possible benefits that could assist to motivate an increased tariff include the following:

- Energy savings: replacement of the feeders and furrows with pipelines will increase water pressure in the system, with the net effect that water users do not have to pump water to their land for irrigation (with a corresponding decrease in electricity costs);

- Increased drainage: this would result in decreased salination and waterlogging of soils; and
- Security of water delivery.

During the second stakeholder workshop, the ball-park percentages in the table below were identified.

Infrastructure component	Cost (R m)				
	2016	Grant %	User %	Grant cost	User cost
Main Canals	562.27	100	0	562.27	0.00
Feeders & furrows	2,691.02	50	50	1,345.51	1,345.51
Drains	1,312.64	90	10	1,181.38	131.26
Balancing dams	1,215.24	80	20	972.19	243.05
	5781.17			4,061.35	1,719.82
		% of Total		70	30

It is recommended that the above portion to be paid by users be incorporated into tariff increases. The Vaalharts WUA will be responsible to levy these tariffs. A ball-park tariff increase, based on 2016 prices, is R0.11/ha. This represents a 48% increase on the 2015 tariffs, and should be justified by calculating the electricity savings that water users could expect due to the use of pipes as feeders and furrows, which will increase pressure and reduce the need to pump water to the relevant premises. Vaalharts WUA advised that this recommendation is in line with expected tariff increases.

Implementation Strategy

The implementation strategy for the Vaalharts / Taung irrigation scheme could be grouped into interventions that would constitute the roll-out of the construction works in the longer term, and short-term and collaborative interventions that could be rolled out over the shorter term.

The construction works have already commenced in 2014, with the revitalisation of a critical 2.2 km stretch of canal that requires urgent attention. This portion of repairs has been commissioned and is currently being undertaken by the Vaalharts WUA. A fair amount of research and development is also taking place during this construction. The construction techniques adapted here could be used to successfully roll out further canal construction works.

Regarding the balance of the construction work, Aurecon (2011) makes specific recommendations as to the timeline and programme for upgrading and proposes a capital expenditure program to give effect to necessary changes, based on the “criticality” of each infrastructure component. The detailed priorities are reflected in this report, and are grouped into the following parcels of work:

- Main canals (North canal & Taung North canal);
- Balancing dams;
- Piped feeders & furrows (secondary and tertiary canals); and
- Drains.

A number of short term interventions were also identified, that could remove blockages and act as catalysts for further project progress. They are the following:

- The creation of a rolling fund for the Vaalharts WUA;
- Procurement of engineering and other services;

- Planning for expansions by the Department of Rural, Environment and Agricultural Development;
- Completion of the Environmental Impact Assessment for the project;
- Defining and concluding Memorandums of Understanding;
- Appointment of a project coordinator; and
- Agro-logistics opportunities.

Potential Funding Sources

Potential funding sources that could be targeted were also identified through the course of this assignment. They could be grouped into the following categories:

- Government funding from National Revenue Fund;
- Other Government grants;
- Tariff increases;
- Water markets;
- Capital markets; and
- Private sector markets.

Conclusion

The thinking behind the development of this FIP was also to enable the Vaalharts WUA to approach additional funders with a good motivation – this includes Government institutions, but also off-budget sources and possible commercial funders. The DWS has availed R500 million, by means of the Refurbishment of Canal Infrastructures ("ROCS") budget for the revitalisation project. A portion of these funds have been released for the emergency upgrade work that is currently under way.

In order for the DWS to avail more funds for the greater revitalisation project, the Environmental Impact Assessment ("EIA") for the project needs to be completed. During the course of this assignment it became clear that certain blockages prevent the completion of the EIA. These blockages are the following:

- A lack of funds (and a lack of cash flow) by the Vaalharts WUA to perform work that is needed to complete the EIA (e.g. the procurement of engineering services); and
- A three-dimensional survey of the scheme area needed to be completed, which would enable the Technical Implementation Committee to do the necessary designs for EIA purposes.

Thanks to the facilitative nature of this process, both of the above blockages were overcome. The DWS availed R 5 million to the Vaalharts WUA, as a rolling fund, in order to procure services as needed to complete the EIA and other work that needs to be completed. In addition to this, the DALRRD availed R2.5 million for the completion of the three-dimensional survey. The Technical Implementation Committee and Project Office are now enabled to do the necessary work to enable the EIA process to keep on track.

It however also became clear that the management structure of the project needs to be reconstituted, as the responsible individuals in the Steering Committee and Technical Committee for the revitalisation project stopped attending the relevant meetings. Members of the private sector should also be included in these committees. The suggestion is that the public sector individuals provide an oversight function while the private sector individuals assist to perform work that needs to be completed and provide practical assistance and guidance in a consulting capacity. When these

committees are fully functional it would enable the project to overcome blockages, like the blockages discussed above, within a short turnaround time.

In order to further investigate the possibilities of obtaining off-budget funding sources for the development of the Taung portion of the scheme to the benefit of emerging farmers, this development needs to be planned and soil surveys completed to identify suitable arable land. This is however yet to take place, and it is recommended to pursue the short term and collaborative interventions in this report as a matter of urgency in order to ensure that the project remains on track.

Most funders will only consider providing assistance to projects that are "shovel-ready", where the basic governance issues have been overcome and initial planning has been completed. It is therefore important to address these issues, in order to unlock water access for emerging farmers in Taung.

List of abbreviations

BBBEE Act	Broad-Based Black Economic Empowerment Act, Act 53 of 2003
CARA	Conservation of Agricultural Resources Act
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Northern Cape Department of Agriculture, Land Reform and Rural Development
DARD NW	Department of Agriculture and Rural Development, North-West Province
DBSA	Development Bank of Southern Africa
DEA	Department of Environmental Affairs
DEDECT	Department of Economic Development, Environment, Conservation & Tourism, North-west
DOA	Department of Agriculture
DOCG	Department of Cooperative Governance
DRDLR	Department of Rural Development and Land Reform
DWS	Department of Water and Sanitation
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
FIP	Funding and Investment Plan
GEPF	Government Employees Pension Fund
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
KOBWA	Komati Basin Water Authority
MISA	Municipal Infrastructure Support Agent
MOU	Memorandum of Understanding
MWIG	Municipal Water Infrastructure Grant
NAMC	National Agricultural Marketing Council
NBF	Nepad Business Foundation
NT	National Treasury
NWA	National Water Act, Act 36 of 1998
NWPG	North-West Provincial Government
NWRI	National Water Resource Infrastructure Branch
PFMA	Public Finance Management Act, Act 1 of 1999
PIC	Public Investment Corporation
PPP	Public-Private Partnership
PSC	Project Steering Committee
RBIG	Regional Bulk Infrastructure Grant
READ	Department of Rural, Environment and Agricultural Development, North-West
SANRAL	South African National Roads Agency Limited
SWPN	Strategic Water Partners Network
SPV	Special Purpose Vehicle
TCTA	Trans Caledon Tunnel Authority
WUA	Water User Association
WCWDM	Water Conservation and Water Demand Management
WAR	Water Allocation Reform
WSA	Water Services Authority
WTE	Water Trading Entity

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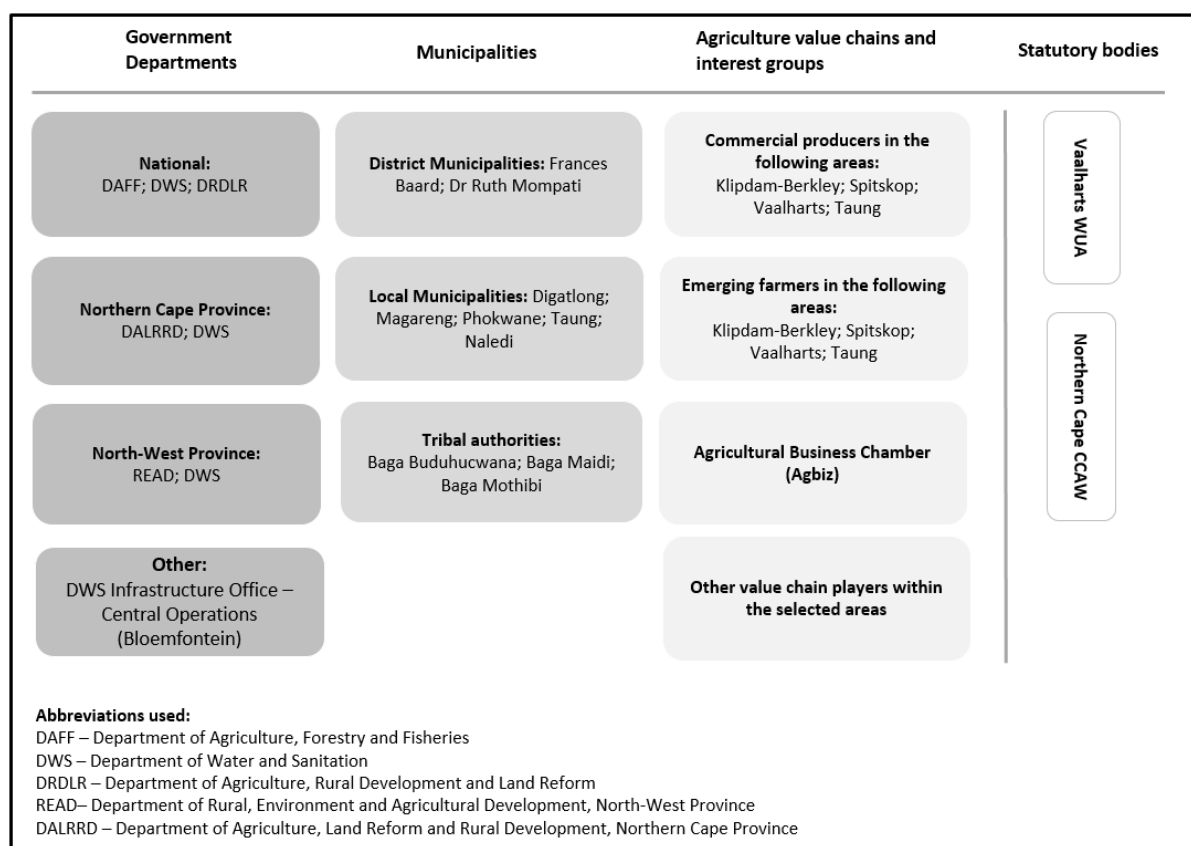
1. Introduction

The Strategic Water Partners Network ("SWPN"), hosted by the Nepad Business Foundation ("NBF"), contracted Agrifusion to develop a multi-stakeholder funding and investment plan ("FIP") for the Vaalharts / Taung irrigation scheme upgrading project. The basis for investment is the increase in economic and/or social value achieved by re-allocation of water saved on the scheme, due to the upgrading of infrastructure.

The deliverable for the development of a Multi-Stakeholder FIP is in the form of a number of papers with specific topics, which are to be consolidated into a single FIP when completed. This document constitutes the FIP, and is intended to be a summary of the most important items as presented in the papers that have been provided to the SWPN. The inputs of various stakeholders were used in the execution of this study, including the inputs of the Vaalharts Water User Association ("WUA"), Northern Cape Department of Agriculture, Land Reform and Rural Development ("DALRRD"), Department of Rural, Environment and Agricultural Development, North-West ("READ"), Department of Water and Sanitation ("DWS") and the Technical Implementation Committee for the Vaalharts / Taung irrigation scheme upgrading project.

Two stakeholder workshops were held and the inputs of key stakeholders obtained. Please see below the stakeholder map, detailing key stakeholders. A fair representation of stakeholders were present at the workshops.

Figure 1 - Stakeholder Map



This document will outline the key baseline information and findings of the study, as was detailed in the papers. Further elaboration is also provided where necessary. References are made to the papers as needed.

2. Context

A large portion of the capital that is required for the revitalisation of the Vaalharts / Taung irrigation scheme will be funded by the Department of Water and Sanitation ("DWS"). Funds could however also be sourced from other Government departments and alternative off-budget sources. The following social and developmental factors could serve as a motivation:

- A large number of municipalities in the Northern Cape and North-West Province are dependent on water from the scheme. Many poor and destitute individuals are reliant on potable water from the scheme;
- The upgrade of the irrigation scheme includes the extension of the Taung Canal, which would enable the development of additional agricultural production of approximately 2800 ha for emerging farmers. This could have a huge knock-on effect for employment creation and boost the rural economy;
- The project could be linked with other interventions, e.g. the Agriparks initiative by the DRDLR, to ensure an integrated approach and further boost the rural economy.

In order to source such funds the project costs, implementation priorities and institutional arrangements should be sound. This document explores these themes, and makes specific recommendations to assist the project to get closer to implementation.

3. Current Water Use in the Vaalharts / Taung Irrigation Scheme

The Vaalharts / Taung Irrigation Scheme is the largest irrigation scheme in South Africa, and is located in the Northern Cape and the North-West Province. It has approximately 35 302ha of land under irrigation, of which 31 732ha is located within the Northern Cape, and 3 570ha in the North West Province. An additional 2 854ha could be made available to farmers in the Taung area if the North canal of the irrigation scheme is refurbished.

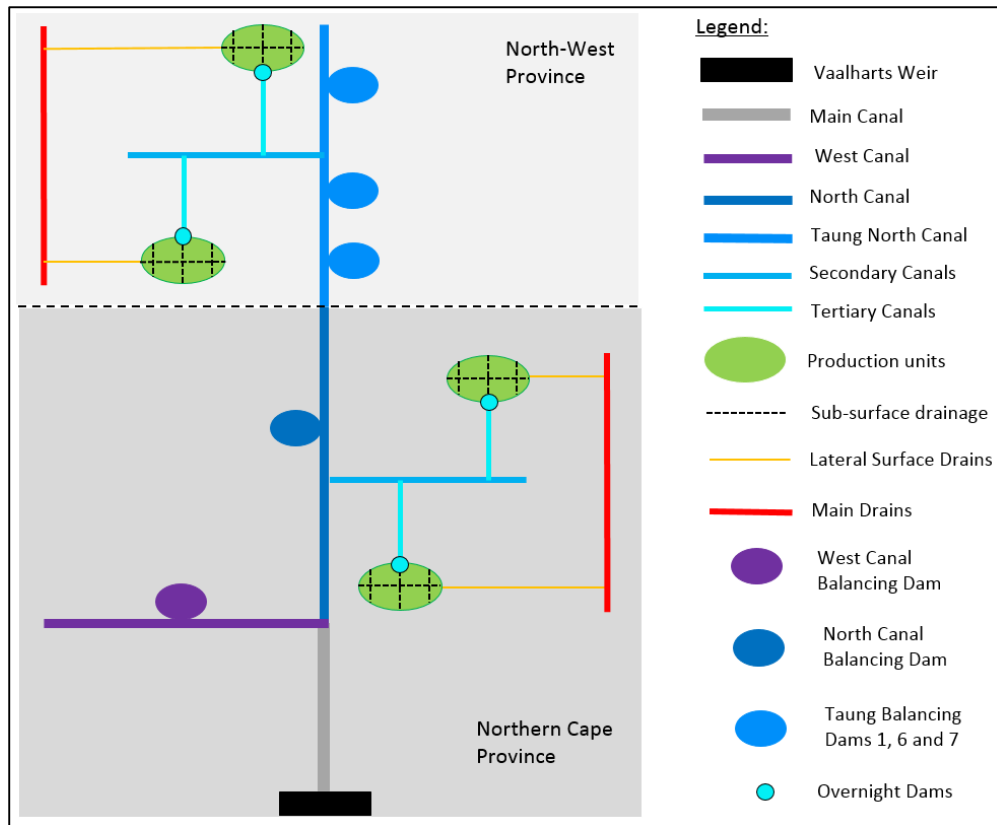
The following municipalities are serviced by the scheme:

- District municipalities: Frances Baard, Dr Ruth Segomotsi Mompati;
- Local municipalities: Dikgatlong, Magareng, Phokwane, Greater Taung.

It is estimated that the population in the above municipalities might reach 400 000 by 2030, which will greatly increase the need for water and security of water delivery.

Bulk water is diverted from the Vaalharts weir in the Vaal River. This weir diverts water, via a network of canals in excess of 1000km long, to the Vaalharts and Klipdam-Barkly Water Schemes. The Vaalharts / Taung irrigation scheme provides water to approximately 1250 farming units, which vary in size from 25 ha to 75 ha. See below a schematic layout of the Vaalharts / Taung irrigation scheme, detailing main infrastructure components.

Figure 2 - Main Infrastructure Components



4. Condition of Bulk Water Infrastructure

The canals of the Vaalharts / Taung Irrigation Scheme are generally in a poor condition and require urgent attention – the concrete lining has become brittle, cracked and has been displaced in some areas. It is estimated that up to 30% of the water allocated in the scheme is lost due to seepage, which occurs in the main canals as well as the secondary and tertiary canals.

The condition of the bulk water infrastructure has deteriorated to such an extent, that the scheme would not be able to sustain its current development, let alone develop new agricultural production. If the scheme is only kept afloat by means of scheduled maintenance, the possibility of a canal failure in the future, leading to a total water supply shutdown, is very high. The Vaalharts WUA is actively busy with rehabilitation works as far as their resources permit, but this will only delay the inevitable collapse of infrastructure by a few years.¹ The figures below illustrate the condition of the infrastructure.

¹ Moedi, 2013: 27

Figure 3 - Cracked Canal Lining



Figure 4 - Sedimentation of Eroded Soil in Canals



Figure 5 - Cracked Joints Between Concrete Panels



Figure 6 - Honeycombing of Concrete on Existing Rehabilitation Work



If the scheme is not rehabilitated, the scenarios for development are very limited. The detrimental impact of the situation where the scheme is not rehabilitated is canvassed in the table overleaf. The impact is described in terms of economic, financial, socio-political, water loss and environmental drivers.²

² These consequences are further described in *Paper 2*

Table 1 - Status Quo if no Rehabilitation Takes Place

Economic	<ul style="list-style-type: none"> • Depreciation of 62% of water infrastructure; • 66% of infrastructure in a very poor condition; • Potential loss of up to 7,500 job opportunities; and • Decreased localisation and earnings of foreign exchange.
Financial	<ul style="list-style-type: none"> • Possible loss of up to 50% of production; • The Northern part of the irrigation scheme generates a turnover of almost R690 million per annum, with a multiplier effect on almost R1.1 billion per annum; and • Salvage value of only 10% on dilapidated infrastructure assets.
Socio-political	<ul style="list-style-type: none"> • Compromised domestic water supply to 170,000 people; Anticipated demand for domestic supply to 400,000 people by 2030; • Ruth Segomotsi Mompati District has been identified as a distressed district in SIP11; • Risk of civil unrest; and • Inability of institutions to mitigate disaster circumstances.
Water loss	<ul style="list-style-type: none"> • Up to 30% water loss in certain areas; • 105,000,000 m³/a could be saved; • Up to 30% of the scheme experiences poor drainage, poor crop and soil condition and high soil salt content; and • Severe water logging is taking place – the water table has risen from 24m deep to only 1m deep.
Environmental	<ul style="list-style-type: none"> • Lack of drainage, flat topography and geological condition lead to environmental challenges; • Up to 50% of the scheme is waterlogged; • Salt content of soil has risen due to long term use of fertilisers; and • Soil structure and quality has been altered and chemical degradation is present.

5. The Aurecon Report

It is against the background provided above that the upgrading of the Vaalharts / Taung irrigation scheme was first proposed in 2008. A lot of work has been done since 2008, leading to the development of a comprehensive feasibility study for the revitalisation project by the Aurecon Group. This study forms the cornerstone of the recommendations made in this FIP.

5.1 Upgrading Options

During 2010 and 2011, the DALRRD contracted Aurecon Group, together with a consortium, to develop a Feasibility and Business Plan on the Rehabilitation/Upgrading of Bulk Water Infrastructure and Agri-Business Development in the Vaalharts / Taung Irrigation Region ("the Aurecon report"). This report is made up of three different volumes, each with a different focus. It makes recommendations and conclusions regarding the proposed upgrading to the Vaalharts / Taung irrigation scheme.

The Aurecon report presents three options for development and/or upgrading of the scheme. The options have been determined with the knowledge that soil and infrastructure conditions are declining, productivity is declining, while the domestic demand is increasing, with an estimated 400 000 domestic users being supplied from the scheme.

In summary, the three options provided by Aurecon (2011) are the following:³

- Option 1: Maintain the *status quo* and increase Operation & Maintenance costs;
- Option 2: Rebuild the scheme in a similar way to current construction; and
- Option 3: Rebuild the scheme using the most optimum and eco-friendly methods possible (including replacement of secondary and tertiary canals with pipes).

A well-motivated argument in favour of Option 3 is presented in the Aurecon (2011) reports, and this option has also been identified by the Steering Committee of the Vaalharts / Taung irrigation scheme upgrading project as the desired option.⁴ This has also been ratified by the stakeholder forum during the first stakeholder workshop.

5.2 Funding Scenarios

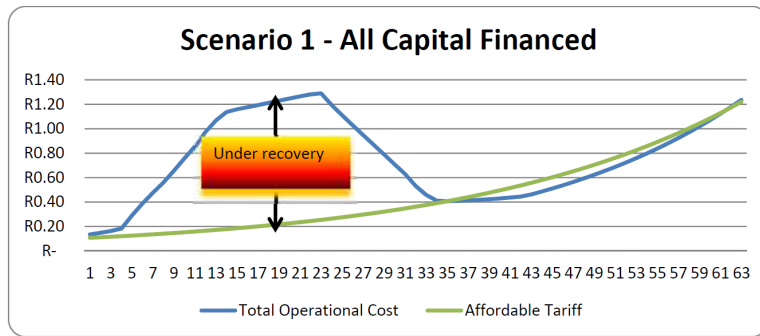
According to Aurecon (2011), the capital required as at 2011 is R4 billion. Four different scenarios were developed to fund the R4 billion that is required for the Vaalharts / Taung irrigation scheme upgrading project. They were the following:

Scenario 1: all capital financed over 20 years at 8% interest. This showed a cumulative cash flow deficit of R 7 billion due to under recovery, and is not deemed affordable or sustainable.

Figure 7- Scenario 1 - All Capital Financed

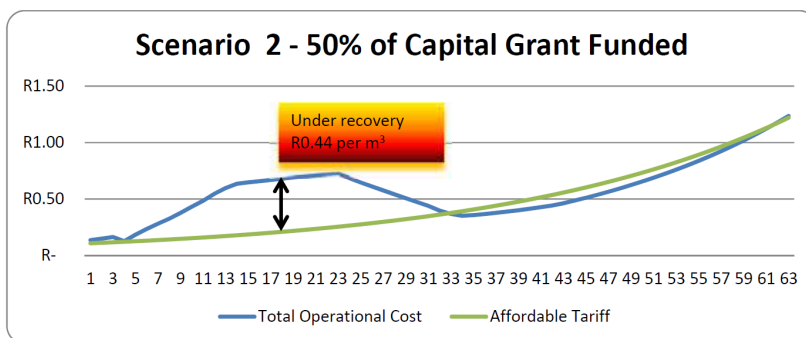
³ These options are more fully discussed in *Paper 1*

⁴ This meeting took place on 26 August 2011; minutes are available from the DALRRD



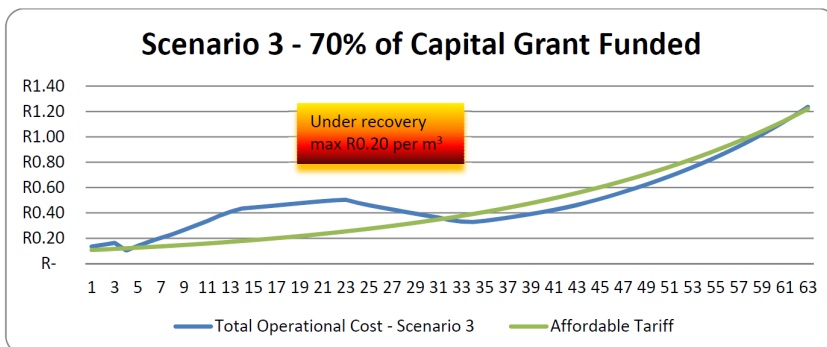
Scenario 2: assumes that 50% of capital will be borrowed over 20 years at 8%, and that 50% will be grant funded. The cumulative cash flow deficit of R3.1 billion is not considered to be affordable.

Figure 8 - Scenario 2 - All Capital Grant Funded



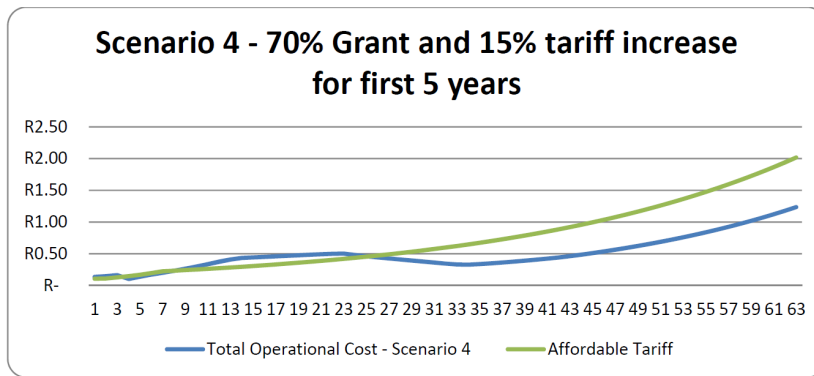
Scenario 3: assumes that 50% capital grants will be obtained from the Government, a further 20% grants from financing institutions (like the DBSA) and 30% financed through other institutions. The remaining deficit will have to be funded through water tariff increases. The maximum cash flow deficit over the period is R1.2 billion.

Figure 9 - Scenario 3 - 70% of Capital Grant Funded



Scenario 4: assumes that 50% of the capital is grant funded by National Government given the national importance of the scheme, 20% grant funding is obtained from financing institutions, and the remaining 30% financed. It was further assumed that the farmers will agree to a 15% tariff increase on operations and maintenance costs for the first 5 years.

Figure 10 - Scenario 4 - 70% Grant and 15% Tariff Increase for First 5 Years



From the above it is clear that grant funding of up to 70% of the capital will be required in order to lower the water tariff to an affordable level. It should be noted that the recommendation by Aurecon (2011) to increase the operations and maintenance levy by 15% for the first 5 years, was intended as a transitional arrangement to free up additional funds to launch the project. Further tariff increases in the longer term will be much higher than this recommendation. Refer to Paragraph 8 below for a further discussion on tariff increases.

6. Roles and Responsibilities of Stakeholders Involved in the Scheme

There are various stakeholders, Government authorities or otherwise, involved in the Vaalharts / Taung irrigation scheme. These stakeholders could be classified in terms of departments that are directly responsible for a portion of the upgrade work, and departments that are indirectly involved in the scheme, due to legislative responsibilities or other interests.

The stakeholders that are involved in the scheme are further elaborated upon below.

6.1 Stakeholders Responsible for Bulk Water Infrastructure

6.1.1 Department of Water and Sanitation

The Department of Water and Sanitation ("DWS") (formerly Department of Water Affairs) is mandated by the National Water Act, Act 36 of 1998, to regulate and develop all activities affecting water sources through and among others, preservation of water resources, providing water use authorisations and influencing flow regime and resource quality respectively. The DWS is responsible for achieving the purposes of the National Water Act on behalf of the Minister of Water and Sanitation.

DWS plans, funds, constructs, maintains and operates the water resources infrastructure, and also sets and recovers water use charges. DWS, through its Water Trading Entity ("WTE"), manages the National Water Resource Infrastructure ("NWRI") held in the trading accounts.

Infrastructure that is funded on-budget is implemented through the Infrastructure Branch of the DWS. Some of the infrastructure costs are expected to be recovered through the infrastructure charge as determined by the DWS' pricing strategy.

Within the context of the Vaalharts / Taung irrigation scheme, the DWS is the asset owner and custodian of the bulk water infrastructure, which includes the following components:

- Vaalharts weir (with inlet structures and tunnels);
- Main canal, North canal and Taung North canal;

- Secondary and tertiary canals;
- Balancing dams;
- Sluices;
- Lateral surface drains; and
- Main drains.

The DWS also has regional offices in the Northern Cape and North West Province. The Vaalharts Water User Association ("WUA") was established in terms of Section 98(6) of the National Water Act, and the first agreement for transfer of responsibilities to the Vaalharts WUA was signed in 2003.⁵ Only the infrastructure has not yet been transferred and still belongs to the DWS.⁶

6.1.2 Vaalharts Water User Association

The Vaalharts Water User Association ("WUA") was established by the Minister of Water and Sanitation in terms of Section 98(6) of the National Water Act, Act 36 of 1998. The Vaalharts WUA concluded agreements with the Department of Water and Sanitation ("DWS") to fulfil certain functions on behalf of the Department, including operation and maintenance of the Vaalharts Irrigation Scheme.⁷

The Vaalharts WUA has certain functions delegated to it by the National Water Act, Act 36 of 1998 and by agreements entered into with the DWS. A constitution was compiled, outlining the roles and responsibilities of the Vaalharts WUA. In essence, the functions of the Vaalharts WUA include the operations, maintenance and management of the Vaalharts / Taung irrigation scheme.

The responsibility to maintain the bulk water infrastructure has been delegated by the DWS to the Vaalharts WUA. In terms of the Vaalharts / Taung irrigation scheme revitalisation project, the emergency upgrading of a 2.2km portion of the North Canal has commenced, and the DWS and Vaalharts WUA are performing this upgrading as a joint venture. To this effect a Memorandum of Understanding ("MOU") has been signed between DWS Chief Operations, DWS Construction Unit West and the Vaalharts WUA.

6.1.3 Department of Agriculture, Forestry and Fisheries

The Department of Agriculture, Forestry and Fisheries ("DAFF") is mandated through legislation, including the Conservation of Agricultural Resources Act, Act 43 of 1983 ("CARA"). It ultimately has an interest in conserving agricultural resources – in this particular instance soil condition and irrigation efficiency is an important motivator for their involvement. The dilapidated condition of the bulk water infrastructure leads to seepage, which causes waterlogging and salinisation of the soil. This soil

⁵ The contents of these agreements are more fully described in Paper 6&7

⁶ Aurecon, 2010: Vol 1: 190

⁷ The following agreements were signed:

- Memorandum of agreement between the Government of South Africa in its Department of Water Affairs and Forestry and Vaalharts Water User association established in terms of Section 98(6) of the National Water Act 36/1998
- Memorandum of agreement between the Department of Water Affairs and Forestry and Vaalharts water user association for the supply of raw water out of the Vaal river, Oct 2006
- Billing agreement for collection of raw water use charges payable to the Department of Water and Sanitation.

condition has weakened to such an extent that it majorly affects agricultural production. DAFF therefore assumes responsibility for in-field drainage infrastructure, by delegation to the provincial agriculture departments. DAFF also has a particular responsibility to support emerging farmers, especially in the case of the North-West Province.

6.1.4 Northern Cape Department of Agriculture, Land Reform and Rural Development

The Northern Cape Department of Agriculture, Land Reform and Rural Development ("DALRRD") is responsible for in-field infrastructure in the Northern Cape Province by delegation from DAFF. It has procured funds from DAFF to perform the initial studies that were done by Aurecon (2011) on the Vaalharts / Taung irrigation scheme revitalisation project, as well as the Environmental Impact Assessment ("EIA") for the first part of the revitalisation project. This EIA covers all bulk infrastructure, including the bulk infrastructure in the North-West Province. Although the DALRRD facilitated the funding, the funding was provided by DAFF, given their interest to decrease waterlogging and salinisation of soil as an agricultural resource.

6.1.5 The Department of Agriculture and Rural Development, North-West

The Department of Rural, Environment and Agricultural Development, North-West ("READ") is responsible for in-field infrastructure in the North-West Province by delegation from DAFF. Given that the irrigated land in the North-West Province mostly constitutes that of emerging farmers, READ also has an increased responsibility to bring water infrastructure to these farmers and to assist in the development of additional agricultural production.

A major motivating factor for funding the Vaalharts / Taung irrigation scheme upgrading project is the saving of water. These water savings would allow increased access to water, which could be allocated to emerging farmers. It is estimated that approximately 2800 ha of land could be developed with the additional allocable water.

The READ is however responsible to facilitate the above expansion, including all preparatory steps. Certain steps that have been identified during the first stakeholder forum workshop⁸ are the following:

- Identifying land that could be developed by emerging farmers;
- Planning the development of additional bulk water infrastructure needed to supply the identified land with water;
- Conducting of an EIA in respect of the proposed expansions.

It is envisaged that various studies and business plans need to be developed to give effect to the above and that the READ would have to take responsibility for these studies. DAFF could assist to provide funds to READ, but it is the responsibility of this department to submit business plans to DAFF for the procurement of funds.

⁸ Hosted by the SWPN on 19 October 2015 at Hartswater

6.2 Local Authorities

6.2.1 Municipalities

The following local and district municipalities are operating within the Vaalharts / Taung area:

- Dr Ruth Segomotsi Mompati District Municipality, North West;
- Greater Taung Local Municipality, North West;
- Frances Baard District Municipality, Northern Cape;
- Phokwane Local Municipality, Northern Cape;
- Magareng Local Municipality, Northern Cape; and
- Dikgatlong Local Municipality, Northern Cape.

The local and district Municipalities obtain their mandate from legislation, in particular the following:

- The Constitution of the Republic of South Africa;
- White Paper on Local Government;
- Local Government Municipal Systems Act, Act 32 of 2000;
- Municipal Structures Act, Act 117 of 1998;
- National Water Act, Act 36 of 1998;
- Water Services Act, Act 108 of 1997; and
- Financial Management Act, Act 56 of 2003.

The municipalities are taking responsibility for certain specific public sector tasks within their respective municipal areas. The municipalities are specifically responsible for ensuring water supply for potable use and maintaining roads and storm water infrastructure.⁹ It is also necessary to extend distribution from the main canal to the specific municipal area to ensure equitable water supply.

6.2.2 Tribal Authorities

Three traditional communities, with traditional leadership structures, are also found within the municipal areas in the North-West Province. They are the following:

- Barolong boo Mariba ba ga Letlhogile Mmusi Abner Lethlogile;
- Batlaping ba Phuduhutswana Tsepo Frederick Mankuroane; and
- Batlaping ba Phuduhutswana ba ga Mothibi Kgosiemang Isaac Mothibi.

These authorities are important role-players within the Taung part of the scheme, as many of the emerging farmers are situated within their communities.

⁹ Aurecon, 2010: Vol 1: 186

The Batlhaping Ba Ga Phuduhutswana Tribal Authority, through whose area the Taung irrigation scheme runs, is presently in the process of a land claim, for the area on which the Taung irrigation scheme is situated. This may lead to the transfer of land from the state to the Tribal Authority.

6.3 Other Stakeholders Involved

6.3.1 Department of Rural Development and Land Reform

The Department of Rural Development and Land Reform ("DRDLR") is responsible for the development of emerging farmers in Vaalharts and Taung. The DRDLR is also a possible source of funding for certain project parcels, especially those from where emerging farmers will benefit.

6.3.2 Department of Environmental Affairs

The Department of Environmental Affairs ("DEA") is responsible for oversight over the Department of Economic Development, Environment, Conservation and Tourism ("DEDECT") and the Department of Environment and Nature Conservation, North-West ("DENC"). The DEA will ultimately provide environmental authorisations in respect of the various activities that will take place during the roll-out of the Vaalharts / Taung irrigation scheme revitalisation project.

6.3.3 Department of Economic Development, Environment, Conservation & Tourism, North West

The Department of Economic Development, Environment, Conservation & Tourism, North West ("DEDECT") is also responsible for providing environmental authorisations as stated above, as it receives delegated powers from the DEA.

6.3.4 Department of Environment and Nature Conservation, Northern Cape

The Department of Environment and Nature Conservation, Northern Cape ("DENC") is also responsible for environmental authorisations as stated above, as it receives delegated powers from the DEA.

6.3.5 South African National Roads Agency Limited ("SANRAL")

SANRAL is responsible for the maintenance of certain roads within the scheme area.

6.3.6 National Agriculture Marketing Council

The National Agriculture Marketing Council ("NAMC") was established in terms of the Marketing of Agricultural Products Act, Act 47 of 1996. It was recently appointed as the coordinator of Strategic Infrastructure Project 11 ("SIP 11"), focusing on agro-logistics and rural infrastructure, which is one of the 18 SIP's identified by the Presidential Infrastructure Coordinating Commission ("PICC"). The rehabilitation of the Vaalharts / Taung irrigation scheme is one of the anchor projects proposed in the SIP11 funding and investment plan, and therefore the NAMC does have a responsibility to bring this project to fruition.

6.3.7 Strategic Water Partners Network

The Strategic Water Partners Network ("SWPN") is a collaboration between the DWS, private sector and civil society working collectively to close the 17% gap between water supply and demand that is anticipated to manifest in South Africa by 2030. One of the SWPN's focus areas is the development of agricultural supply chains, under which the rehabilitation of the Vaalharts / Taung irrigation scheme project resides. The SWPN could therefore support the sourcing of funding through facilitating interactions between the responsible institutions.

6.3.8 Potential Funders

Potential funders include institutions that could provide grants, loans and / or commercial contributions and include the Development Bank of South Africa ("DBSA"), Industrial Development Corporation ("IDC"), the Public Investment Corporation ("PIC") and private institutions such as Coca Cola and ABSA.

6.3.9 Other interested and affected parties

Other interested and affected parties include Agbiz and the Water Research Commission. The North-West University is also an important role-player, as it facilitates social upliftment initiatives in the area. Other cultural organisations and social institutions can also be considered.

7. Governance Structure for the Revitalisation Project

DWS is the custodian and asset owner of the bulk water infrastructure. Governance of the project should therefore fall under the DWS to a large extent, and the National Water Act should provide guidance on basic governance principles.

The governance structure of the Vaalharts / Taung irrigation scheme revitalisation project has been determined to a large extent. It comprises the Steering Committee, Technical Committee and Technical Implementation Committee as further outlined below. A dedicated project office has also been set up to manage the day-to-day roll-out of the Vaalharts / Taung irrigation scheme revitalisation project.

During the second stakeholder forum workshop¹⁰ that was held to obtain inputs for the development of this FIP it has been stated that individual committee members stopped attending the meetings, stifling project progress. It has been suggested to reconstitute these committees, and to invite members of the private sector to be included. The suggestion is that the public sector individuals provide an oversight function while the private sector individuals assist to perform work that needs to be completed and provide practical assistance and guidance.

¹⁰ Hosted by the SWPN on 25 November 2015 at Hartswater

7.1 Steering Committee

7.1.1 Roles and Responsibilities

The Steering Committee should be responsible for procuring funds, approval of budgets and contracting. It would also play a vital role in establishing inter-connection between all relevant Departments, providing institutional oversight and performing a management function.

7.1.2 Composition

The Steering Committee is currently comprised of individuals from the following institutions:

- DWS;
- Department of Agriculture, Forestry and Fisheries ("DAFF");
- Department of Environmental Affairs ("DEA");
- Vaalharts WUA;
- Department of Agriculture, Land Reform and Rural Development, Northern Cape ("DALRRD");
- Department of Environment and Nature Conservation, Northern Cape ("DENC");
- Department of Rural, Environment and Agricultural Development, North-west ("READ");
- Department of Economic Development, Environment, Conservation & Tourism ("DEDECT");
- North-west Provincial Government ("NWPG");
- District Municipalities;
- National African Farmers Union ("NAFU");
- Industrial Development Corporation ("IDC");
- Development Bank of South Africa ("DBSA");
- Taung Agricultural College;
- Senwes, Grain SA, Hinterland and Obaro; and
- Endecon consultants.

In addition to the above, it is recommended that representatives of the following institutions be added to the Steering Committee:

- Department of Rural Development and Land Reform ("DRDLR");
- Strategic Water Partners Network ("SWPN");
- National Agriculture Marketing Council ("NAMC");
- Agbiz; and
- Confirmed funders.

7.2 Technical Committee

7.2.1 Roles and Responsibilities

The Technical Committee is to take responsibility for decision-making in respect of implementation and design of the project, and delegating of these powers to the Technical Implementation Committee. It also plays an important role in the coordination of the project and ensuring clear lines of communication between the Technical Implementation Committee and the Steering Committee.

7.2.2 Composition

The Technical Committee is currently comprised of individuals from the following institutions:

- DWS;
- DAFF;
- DRDLR;
- DEA;
- Vaalharts WUA;
- DALRRD;
- DENC;
- READ;
- DEDECT;
- North-west Provincial Government ("NWPG"); and
- District Municipalities.

7.3 Technical Implementation Committee

7.3.1 Roles and Responsibilities

The Technical Implementation Committee should be responsible for the day-to-day management of the project and relaying of relevant information to the Technical Committee. The Technical Implementation Committee should be streamlined to coordinate and manage the implementation of the program. A design team should also originate from the Technical Implementation Committee, and should be responsible for producing preliminary designs, timeframes and cost estimates.

7.3.2 Composition

The Technical Implementation Committee is currently comprised of representatives from the following institutions:

- DWS;
- DAFF;
- DRDLR;

- Vaalharts WUA;
- DALRRD; and
- READ.

7.4 Project Office

A dedicated project office has been set up to manage the day-to-day roll-out of the Vaalharts / Taung irrigation scheme revitalisation project. This office should report to the Technical Implementation Committee on progress made with project implementation. This office should also be responsible for information dissemination via the Vaalharts WUA.

8. Funding Requirements

8.1 Estimated Project Cost

The project cost for the Vaalharts / Taung irrigation scheme revitalisation project has been identified in the Aurecon (2011) reports. During the second stakeholder forum workshop¹¹ it was confirmed that an annual escalation of 8% is appropriate to determine updated project costs. The project costs are indicated in the table below.

Table 2 - Project Cost (Revitalisation Project)

Infrastructure component	Cost (R m)							
	2011	2012	2013	2014	2015	2016	2017	2018
Main Canals	382.67	413.28	446.35	482.05	520.62	562.27	607.25	655.83
Feeders & furrows	1,831.46	1,977.98	2,136.21	2,307.11	2,491.68	2,691.02	2,906.30	3,138.80
Drains	893.36	964.83	1,042.02	1,125.38	1,215.41	1,312.64	1,417.65	1,531.06
Balancing dams	827.07	893.24	964.69	1,041.87	1,125.22	1,215.24	1,312.46	1,417.45
Project Total (Aurecon)	3,934.56	4,249.33	4,589.27	4,956.41	5,352.93	5,781.17	6,243.66	6,743.14

A 2.2 km section of canal is currently being rebuilt as an emergency measure. The total cost for this portion of work has also been updated, using an annual escalation of 8%. The project cost for the emergency upgrades is indicated below.

Table 3 – Project Cost (Emergency Upgrades)

Infrastructure component	Cost (R m)			
	2013	2014	2015	2016
2.2 km pilot section	46.5	50.22	54.24	58.58

8.2 Contribution by Water Users

It is recommended that water users contribute a portion of the infrastructure development cost for the irrigation scheme revitalisation project, proportional to the benefits that accrue to them. Detailed

¹¹ Hosted by the SWPN on 25 November 2015 at Hartswater

calculations should still be made based on the benefit received by each water user. Possible benefits that could assist to motivate an increased tariff include the following:

- Energy savings: replacement of the feeders and furrows with pipelines will increase water pressure in the system, with the net effect that water users do not have to pump water to their land for irrigation (with a corresponding decrease in electricity costs);
- Increased drainage: this would result in decreased salination and waterlogging of soils; and
- Security of water delivery.

During the second stakeholder workshop, the ball-park percentages in the table below were identified.

Table 4 – Project Cost (Grant / User Portions)

Infrastructure component	Cost (R m)				
	2016	Grant %	User %	Grant cost	User cost
Main Canals	562.27	100	0	562.27	0.00
Feeders & furrows	2,691.02	50	50	1,345.51	1,345.51
Drains	1,312.64	90	10	1,181.38	131.26
Balancing dams	1,215.24	80	20	972.19	243.05
	5781.17			4,061.35	1,719.82
			% of Total	70	30

In the table above, grant funding refers to funding from National Government and also grants from other funding institutions like the Development Bank of South Africa (DBSA). The user portion refers to a portion of the cost to be recovered from all water users including agricultural water users, industrial water users and other water users. The specific portion of costs to be recovered from each sub-type of water user should still be determined. The possibility also exists to obtain additional grant funding for the portions to be paid by emerging farmers, and should be further investigated.

8.3 Possible Tariff Increases

Based on the grant / user apportionment of project costs as identified above, high-level calculations were made to determine whether a tariff increase would be within the recommended range.

The following assumptions were made in these calculations:

- Total allocation in the scheme: 360 million m³/a;¹²
- Water quota: 9140 m³/ha/a;¹³
- All users pay the same tariff;
- Lifetime of infrastructure: 45 years; and
- No escalations were taken into account.

¹² Based on the total extraction from the Vaal River

¹³ The quota for Spitskop (2700 ha) is higher, but is negligible for calculation purposes

Table 5 - Determination of Tariff Increase

Determination of tariff increase		
	Cost (R m)	Cost (R)
Portion to be paid by users	1,719.82	
Cost per year (45 years)	38.22	
Cost per cubic metre		0.11

In conclusion, a ball-park tariff increase to be levied from users is R0.11/ha.¹⁴ The average 2015 tariffs levied from users is R0.18/ha by Vaalharts WUA for operations and maintenance, and R0.045/ha by the DWS for a portion of capital costs and also for recovery of running costs. When the tariff increase is added to the current tariffs, the total tariff to be levied is R0.335/ha, amounting to a 48% increase. This increase should be justified by calculating the electricity savings that water users could expect due to the use of pipes as feeders and furrows, which will increase pressure and reduce the need to pump water to the relevant premises. Vaalharts WUA advised that this recommendation is in line with expected tariff increases.

In the Aurecon (2011) report, it is suggested to increase the operations and maintenance levy by 15% for the first 5 years as a transitional arrangement. This was intended to free up additional funds to launch the project. Within this context, the Vaalharts WUA advises that the current tariff increase is reasonable.

9. Implementation Strategy

The implementation strategy for the Vaalharts / Taung irrigation scheme could be grouped into interventions that would constitute the roll-out of the construction works in the long term, and short-term and collaborative interventions that could be rolled out over the short term. Further detail is provided below.

9.1 Construction Works

9.1.1 Pilot Construction Works on the North Canal

The construction works have already commenced with the revitalisation of a critical 2.2 km stretch of canal that requires urgent attention.¹⁵ This stretch of canal has been identified by Moedi Consulting Engineers as the most critical portion of canal that requires emergency measures.¹⁶ This portion of repairs has been commissioned and is currently being undertaken by the Vaalharts WUA. A fair amount of research and development is also taking place during this construction. The techniques adapted here could be used to successfully roll out further canal construction works.

¹⁴ This tariff could be levied as an operations and maintenance charge, a capital repayment or a combination of these two mechanisms. The Vaalharts WUA will calculate the tariffs levied, but it is recommended that specialist input be obtained to accurately calculate the tariff increase. No interest is currently taken into account.

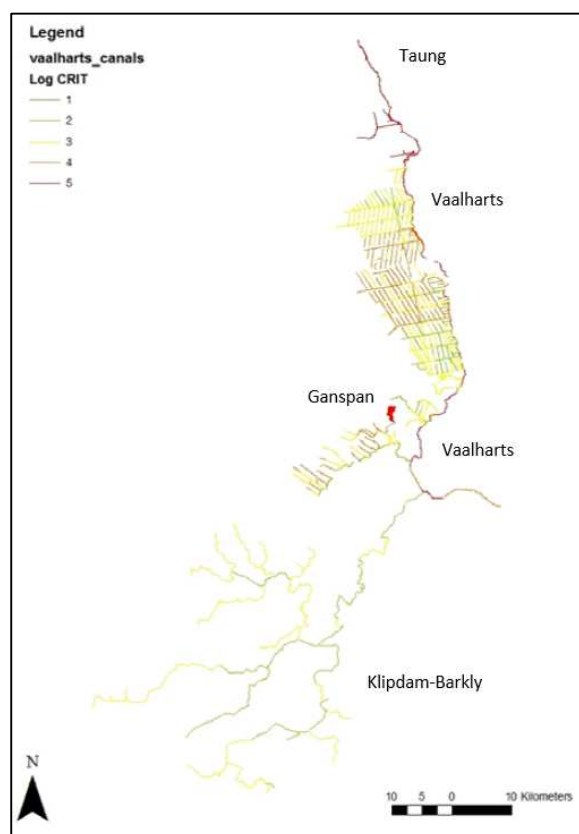
¹⁵ This is a portion of the Vaalharts North Canal, between the Hartswater tunnel and Feeder 12

¹⁶ Moedi (2013)

9.1.2 Roll-out of Main Construction Works

Aurecon (2011) makes specific recommendations as to the timeline and programme for upgrading and proposes a capital expenditure program to give effect to necessary changes, based on the “criticality” of each infrastructure component. The figure below illustrates the priority of rehabilitating each infrastructure component. A score of 5 indicates the highest priority, while a score of 1 indicates the lowest priority.

Figure 11 - Illustration of Rehabilitation Priority¹⁷



The tables below indicate the first ten years of the proposed capital expenditure program by Aurecon, adapted according to priorities as identified during the second stakeholder forum workshop¹⁸. It breaks up the project into the following parcels of work:

- Main canals (North canal & Taung North canal);
- Balancing dams;
- Piped feeders & furrows (secondary and tertiary canals); and
- Drains.

¹⁷ Aurecon, 2011. Vol 3: 30

¹⁸ Hosted by the SWPN on 25 November 2015 at Hartswater

Table 6 - Construction Priorities (Main Canals)

Main Canals (North and Taung)	R m		Years									
	2011	2016	1	2	3	4	5	6	7	8	9	10
Main Canal (Start - KB)	36.9	54.243	x	x								
Main Canal (KB - Wes)	5.8	8.526										
North Canal (Wes - F1)	52.8	77.616		x	x							
North Canal (F1 - F2)	55.8	82.026				x	x	x				
North Canal (F2 - F4)	14.1	20.727						x	x			
North Canal (F4 - F5)	14.6	21.462							x			
North Canal (F5 - F6)	6.5	9.555							x			
North Canal (F6 - F7)	5.5	8.085							x	x		
North Canal (F7 - F8)	14.2	20.874								x		
North Canal (F8 - F9)	13.2	19.404								x		
North Canal (F9 - F10)	13.2	19.4								x	x	
North Canal (F10 - F11)	1.6	2.4	x									
North Canal (F11 - F12)	29.8	43.8	x									
North Canal (F12 - F13)	9.8	14.4										x
North Canal (F13 - 14)	10.8	15.9										x
North Canal (F14 - F15)	8.2	12.1										x
North Canal (F15 - F16)	-	-										
North Canal (F16 - F17)	15.7	23.1										x
North Canal (F17 - F18)	-	-										
Taung (canal)	74.0	108.8	x									
Canals total	382.5	562.3										

Table 7 - Construction Priorities (Feeders & Furrows)

Feeders & Furrows (piped)	R m		Years									
	2011	2016	1	2	3	4	5	6	7	8	9	10
Feeder 1	56	82.32						x				
Feeder 2	62.6	92.022						x				
Feeder 4	72.1	105.987						x				
Feeder 5	75.3	110.691						x	x			
Feeder 6	74.3	109.221	x					x	x			
Feeder 7	67.1	98.637	x					x	x	x		
Feeder 8	75.1	110.397	x	x								
Feeder 9	77.4	113.778	x	x	x							
Feeder 10	88.9	130.683	x		x							
Feeder 11	106	155.82	x		x	x						
Feeder 12	89.8	132.006	x			x	x					
Feeder 13	72	105.84	x				x					
Feeder 14	92.7	136.269	x	x			x	x				
Feeder 15	96.6	142.002	x	x						x		
Feeder 16	88.8	130.536	x	x						x	x	
Feeder 17	20.9	30.723	x	x							x	
Feeder 18	6.4	9.408	x	x							x	
West Canal	325.8	478.926	x	x								
Ganspan	13.5	19.845	x	x							x	
Taung (pipes)	269.5	396.165								x	x	x
Total	1831	2691.57										

Table 8 - Construction Priorities (Drains)

Drains	R m		Years									
	2011	2016	1	2	3	4	5	6	7	8	9	10
Feeder 1	30	44.1			x							
Feeder 2	18.2	26.8			x	x						
Wes (24A-25B)	11.3	16.6				x						
Wes (25C-27F)	36.3	53.4				x	x					
Section 1	20.3	29.8					x					
Section 2	18.7	27.5					x	x				
Section 3	63.3	93.1						x	x			
Section 4	106	156.3							x	x	x	
Section 5	102	150.2									x	x
Balance of costs	487	715.6										
Total	893	1313.3										

Table 9 - Construction Priorities (Balancing Dams)

Balancing dams	R m		Years									
	2011	2016	1	2	3	4	5	6	7	8	9	10
Dam 1	82.7	121.6	x									
Dam 2	82.7	121.6		x								
Dam 3	82.7	121.6			x							
Dam 4	82.7	121.6				x						
Dam 5	82.7	121.6					x					
Dam 6	82.7	121.6						x				
Dam 7	82.7	121.6							x			
Dam 8	82.7	121.6								x		
Dam 9	82.7	121.6									x	
Dam 10	82.7	121.6										x
Total	827	1215.7										

The Environmental Impact Assessment ("EIA") for the construction works has commenced. The EIA is scheduled in a number of phases, according to the infrastructure categories that constitute the upgrade works.

It is intended that the Technical Implementation Committee develop the designs for each phase and facilitate the procurement of services that are required for these designs. As each design phase is completed, the corresponding EIA work for the phase commences.

The implementation schedule for the EIA phases is indicated below.

Table 10 - EIA Phases

Phase	Component
1	North Canal
2	West Canal, Ganspan and the Vaalharts Farms
3	KB Canals and Spitskop
4	Balancing dams (North Canal, Taung Canal, West Canal)
5	Supply reservoirs and pipelines
6	Main canal and pre-cleaning facilities
7	Main drains
8	Sub drains and underground drainage lines
9	Drain communal discharge in Harts River
10	Registration of all proposed and existing borrow pits
11	Dumping sites

9.2 Short Term and Collaborative Interventions

It is proposed that the following interventions be pursued as a matter of urgency, as they could act as a catalyst for further project progress.¹⁹

9.2.1 The Creation of a Rolling Fund for the Vaalharts Water User Association

The Vaalharts WUA voiced the need for a "rolling fund" of R5 million, that could be controlled by them. The idea behind the fund is to enable the Vaalharts WUA to make disbursements and proceed with important services that are required, without having to go through tedious administrative processes for each specific cost item. These services include geotechnical services, a lidar survey and other engineering services that are needed to complete the EIA for the irrigation scheme revitalisation project. Although funds for construction works are available through DWS, no funds are available for these preparatory services needed to complete the EIA.

The service provider, SWPN and Vaalharts WUA were informed that the relevant directorate approved a rolling fund of R5 million to be used by the Vaalharts WUA, up until March 2016. As soon as the so-called "order number" is provided to the Vaalharts WUA, they could disburse the funds and obtain the services needed to complete the EIA for the irrigation scheme revitalisation project.

It is recommended that this action be followed up with the DWS, and that the DWS provide a written confirmation to the Vaalharts WUA of such funds. The DWS did undertake to provide such a fund up

¹⁹ These interventions are also discussed in Paper 4 and 5 as well as Paper 10.

until March 2016, but it is recommended that this facility should also be extended for the coming financial years.

9.2.2 Procurement of Engineering and Other Services

The rolling fund as discussed above is needed to procure services that are required to complete designs for EIA purposes. Although a portion of these services could be procured making use of the rolling fund, it would not be sufficient to procure all the services required – quotations therefore need to be obtained to quantify the services that are required and source funds from other sources.

Quotations for work that needs to be completed have been requested from the Vaalharts WUA, but at the time of writing this paper no quotations were provided. It has however been advised during the first stakeholder forum workshop²⁰ that engineering services in the region of R80 million will be required for the irrigation scheme upgrading project.

Further details should be obtained from the Vaalharts WUA, in order for the SWPN (or other stakeholders) to take the matter further and possibly facilitate funding access.

9.2.3 Planning for Expansions by the Department of Rural, Environment and Agricultural Development, North-West

As was discussed in the section on roles and responsibilities, READ is responsible to assist with identification of agricultural land for emerging farmers, planning the development of bulk water infrastructure to reach the emerging farmers and conducting of an EIA for these works. It is recommended that these responsibilities be defined in an MOU to be concluded between READ and Vaalharts WUA, and also between READ and DALRRD. The execution of these responsibilities should take place as a collaborative intervention between READ and the PICC, as the PICC has a mandate to assist with developing infrastructure that serves the rural poor.

During the second stakeholder forum workshop²¹ it was also requested that the involvement of READ be included as a key priority, as its involvement in the Vaalharts / Taung irrigation scheme revitalisation project has been very limited thus far.

9.2.4 Completion of the Environmental Impact Assessment

Although completion of the EIA for the Vaalharts / Taung irrigation scheme revitalisation project is a huge task in itself, it could also be seen as a short-term intervention within the context of the whole project. It is recommended that completion of the EIA also be identified as a short-term intervention that should be given priority.

The Presidential Infrastructure Coordinating Commission ("PICC") is mandated through the Strategic Infrastructure Project 11 ("SIP11") to assist with the roll-out of the Vaalharts / Taung irrigation scheme project. During the first stakeholder workshop, it has been stated that the PICC does have a division that could assist with expediting EIA's.

²⁰ Hosted by the SWPN on 25 November 2015 at Hartswater

²¹ Hosted by the SWPN on 25 November 2015 at Hartswater

It is therefore recommended that the EIA be specifically supported by the PICC as a collaborative intervention. Further direction should be provided by the PICC as to the means in which they could assist.

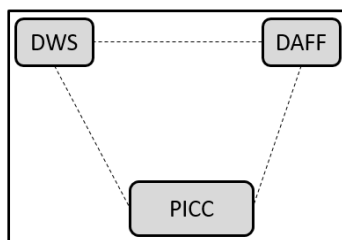
9.2.5 Defining and Concluding Memorandums of Understanding

Given that the roll-out of the Vaalharts / Taung irrigation scheme upgrading project is the joint responsibility of various stakeholders as discussed above, it is recommended that Memorandums of Understanding ("MOU's") be concluded to define all the major relationships and keep role-players accountable. The MOU's could be divided into those that define regulatory roles, and those that are project specific.

It is recommended to first draw up and sign the regulatory MOU's setting out the roles and responsibilities of DWS, DAFF and the PICC. When these MOU's have been concluded, project-specific MOU's could be drawn up by virtue of these agreements.

The figure below represents the relationships for which regulatory MOU's should be concluded. The dotted lines represent individual MOU's that need to be concluded.

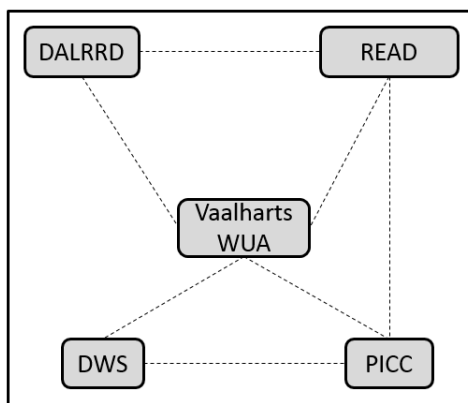
Figure 12 - Regulatory MOU's



Although the content of these agreements should be developed with inputs of stakeholders and be based on legislative responsibilities, it is envisaged that the following broad responsibilities should be defined in the regulatory MOU's: responsibility for bulk water infrastructure, upgrading work, on-farm infrastructure and development of emerging farmers (including bulk water infrastructure to this effect). Inasmuch as possible, these responsibilities should be defined by means of the legislation that imposes responsibilities on the specific stakeholder.

The project-specific MOU's that could be set up are identified in the figure below. The dotted lines represent individual MOU's that need to be concluded.

Figure 13 - Project Specific MOU's



The project-specific MOU's should elaborate on specific relationships that would assist to bring the irrigation scheme revitalisation project to fruition. The following MOU's are proposed:

- Between DALRRD and READ: setting out their respective responsibilities and assisting to mobilise READ;
- Between Vaalharts WUA and DALRRD: defining which entity is responsible for which infrastructure component, and fostering the accountability of each;
- Between Vaalharts WUA and READ: similar to the agreement between Vaalharts WUA and DALRRD mentioned above;
- Between PICC and DWS: defining the specific areas in which the PICC could assist the DWS in exercising their duties;
- Between PICC and the Vaalharts WUA: defining the specific areas in which the PICC could assist the Vaalharts WUA in exercising their duties;
- Between the PICC and READ: defining the specific areas in which the PICC could assist READ in exercising their duties;
- Between Vaalharts WUA and DWS: An MOU, similar to the one currently concluded between the parties for emergency upgrade work, defining the joint responsibility to perform the requisite work. The contents of this MOU should also be evaluated and elaborated upon, based on the lessons learnt during the emergency upgrade phase. An example of this would be to redefine certain responsibilities and to develop safeguards to foster accountability.

9.2.6 Appointment of a Project Coordinator

The responsibility to perform upgrade work lies jointly with the Vaalharts WUA and the DWS. There are however a number of other tasks that need to be completed, including facilitation of the short-term interventions discussed in this paper, which would catalyse further project progress. Given that the Vaalharts WUA is already busy with construction work and is also partly responsible to ensure that all other interventions remain on track, it is proposed that a project coordinator be appointed to assist the Vaalharts WUA and other stakeholders. This role could also be an extension of the responsibilities of the PICC.

The National Agricultural Marketing Council ("NAMC") has been appointed as a coordinator on behalf of the PICC, but it should be considered whether additional capacity is needed to assist the NAMC to address important issues as a matter of urgency. Typical roles and responsibilities to be undertaken by the coordinator include the following:

- Individual liaison with responsible individuals in DWS, DAFF, DALRRD and READ to brief them on their responsibilities and obtain inputs for the drafting of MOU's;
- Assisting DALRRD and READ to mobilise their own responsibilities. This could include regular meetings with these departments and assistance with writing motivations for funding to DAFF;
- Facilitation of the EIA process, including timeous appointment of engineering and other service providers by the Vaalharts WUA and monitoring of the service providers' progress;
- Assisting the Vaalharts WUA to develop a detailed, costed implementation schedule; and
- Defining MOU relationships, and assisting to draft the relevant MOU's in consultation with the relevant departments and other subject matter experts.

9.2.7 Agro-Logistics Opportunities

The Vaalharts / Taung irrigation scheme revitalisation project has been identified as a key national priority under the PICC's Strategic Infrastructure Projects (SIP) 11, Agro-Logistics and Rural Infrastructure. During the second stakeholder forum workshop²² that was held to obtain inputs for the development of this FIP, the issue was raised that certain portions of the roads infrastructure are in a state of disrepair. This includes gravel roads that are used by the various businesses and communities within the geographical area of the Vaalharts / Taung irrigation scheme.

The responsibility to maintain these roads lie with the South African National Roads Agency Limited ("SANRAL") and the Frances Baard District Municipality. Feedback was given during the stakeholder forum workshop that the responsible authorities are not currently cooperative and do not assume their responsibility for the upkeep of this critical infrastructure.

It is therefore recommended that road maintenance be included as a possible collaborative intervention to be pursued by the PICC, as the custodian of SIP11. The PICC could assist to remove this blockage, in order for the responsible individuals to be briefed and provided with further assistance to execute their duties.

A further agro-logistics opportunity would be to link emerging farmers in the Vaalharts / Taung irrigation scheme with Agri-Parks in the area. The Agri-Parks initiative has been launched by the DRDLR to develop a network of services and infrastructure to the benefit of emerging farmers. There are various Agri-Parks in the area, and the Warrenton Agri-Park is in the furthest stage of completion. This is also an opportunity that should be further investigated by the PICC.

10. Potential Funding Sources

Potential funding sources that should be investigated were identified through the course of this assignment.²³ For a summary of these sources, see the table overleaf.

Table 11 - Potential Funding Sources

²² Hosted by the SWPN on 25 November 2015 at Hartswater

²³ These funding sources were identified in Paper 1 and Paper 8 & 9

Type	Name	Application	Base qualifying criteria	Relevant vehicle
Government funding	National Revenue Fund	<ul style="list-style-type: none"> Direct expenditure: national water infrastructure projects Indirect expenditure: regional bulk water and wastewater projects 	DWS infrastructure	DWS
Grants	Resource-Poor Farmer Assistance	<ul style="list-style-type: none"> Capital cost of construction and/or upgrading of irrigation schemes that benefit resource-poor farmers; Operation and maintenance, water resource management and depreciation charges; Acquisition of water entitlements for irrigation, socio-economic studies and WUA training. 	Definition of resource-poor farmers: <ul style="list-style-type: none"> SA citizen from previously disadvantaged population group; Does have water use authorisation; and Unable to raise funds for agricultural development. 	DWS
Grants	Municipal Water infrastructure Grant ("MWIG")	<ul style="list-style-type: none"> Basic water supply to rural consumers, reduction in water losses; and Includes development of new infrastructure and/or upgrading of existing infrastructure. 	<ul style="list-style-type: none"> Municipal water supply, non-revenue water 	Water Services Authority (WSA)
Grants	Regional Bulk Infrastructure Grant ("RBIG")	<ul style="list-style-type: none"> Regional bulk water infrastructure and regional bulk sanitation collection as well as regional water and waste water treatment works 	<ul style="list-style-type: none"> Regional level municipal water supply, non-revenue water 	DWS, Municipalities
Tariffs	N/a	<ul style="list-style-type: none"> Tariffs levied against agricultural water users 	<ul style="list-style-type: none"> Recommended 15% tariff increase in respect of operations and maintenance 	DWS
Water markets	N/a	<ul style="list-style-type: none"> Selling of water use authorisations to users that could contribute to the cost of upgrading (either up front or as part of pricing strategy) 	<ul style="list-style-type: none"> Commercial agricultural and/or industrial entities e.g. Sasol and Coca Cola 	DWS
Capital markets	N/a	<ul style="list-style-type: none"> Raising of funds in local capital markets, e.g. commercial banks, corporate bonds, stock exchange issues (commercial paper), institutional investors e.g. PIC, DBSA 	<ul style="list-style-type: none"> Special Purpose Vehicles ("SPV's") need to be set up, e.g. TCTA 	SPV
Private Sector Markets	N/a	<ul style="list-style-type: none"> Raising of funds in private sector markets, e.g. stock exchange issues (commercial paper), commercial banks 	<ul style="list-style-type: none"> SPV's need to be set up, e.g. TCTA 	SPV

11. Conclusion

Two stakeholder workshops were held, where the inputs of various stakeholders were obtained. Thanks to the workshops, the inputs of the following institutions were instrumental in the development of this study:

- Vaalharts WUA;
- Department of Water and Sanitation ("DWS");
- Department of Agriculture, Forestry and Fisheries ("DAFF");
- Department of Agriculture, Land Reform and Rural Development, Northern Cape ("DALRRD");
- Department of Rural, Environment and Agricultural Development, North-West ("READ").

The thinking behind the development of this FIP was also to enable the Vaalharts WUA to approach additional funders with a good motivation – this includes Government institutions, but also off-budget sources and possible commercial funders. The DWS has availed R500 million, by means of the Refurbishment of Canal Infrastructures ("ROCS") budget for the revitalisation project. A portion of these funds have been released for the emergency upgrade work that is currently under way.

In order for the DWS to avail more funds for the greater revitalisation project, the Environmental Impact Assessment ("EIA") for the project needs to be completed. During the course of this assignment it became clear that certain blockages prevent the completion of the EIA. These blockages are the following:

- A lack of funds (and a lack of cash flow) by the Vaalharts WUA to perform work that is needed to complete the EIA (e.g. the procurement of engineering services);
- A three-dimensional survey of the scheme area needed to be completed, which would enable the Technical Implementation Committee to do the necessary designs for EIA purposes.

Thanks to the facilitative nature of this process, both of the above blockages were overcome. The DWS availed R 5 million to the Vaalharts WUA, as a rolling fund, in order to procure services as needed to complete the EIA and other work that needs to be completed. In addition to this, the DALRRD procured R2.5 million for the completion of the three-dimensional survey. The Technical Implementation Committee and Project Office are now enabled to do the necessary work to keep the EIA process on track.

It however also became clear that the management structure of the project needs to be reconstituted, as the responsible individuals in the Steering Committee and Technical Committee for the revitalisation project stopped attending the relevant meetings. Members of the private sector should also be included in these committees. The suggestion is that the public sector individuals provide an oversight function while the private sector individuals assist to perform work that needs to be completed and provide practical assistance and guidance. When these committees are fully functional it would enable the project to overcome blockages, like the blockages discussed above, within a short turnaround time.

In order to further investigate the possibilities of obtaining off-budget funding sources for the development of the Taung portion of the scheme to the benefit of emerging farmers, this development needs to be planned and soil surveys completed to identify suitable arable land. This is however yet to take place, and it is recommended to pursue the short term and collaborative interventions in this report as a matter of urgency in order to ensure that the project remains on track.

Most funders will only consider providing assistance to projects that are "shovel-ready", where the basic governance issues have been overcome and initial planning has been completed. It is therefore important to address these issues, in order to unlock water access for emerging farmers in Taung.

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