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REPUBLIC OF SOUTH AFRICA

Post Feasibility Bridging Study for the Proposed Bulk Conveyance Infrastructure from the
Raised Clanwilliam Dam (WP0485)

Agricultural Production and Farm Development Report



Department of Water and Sanitation
Directorate: Options Analysis

**POST FEASIBILITY BRIDGING STUDY FOR THE PROPOSED BULK CONVEYANCE
INFRASTRUCTURE FROM THE RAISED CLANWILLIAM DAM**

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STUDY TEAM


Approved for Aurecon South Africa (Pty) Ltd:

.....
E VAN DER BERG
Technical Director

DEPARTMENT OF WATER AND SANITATION
Directorate Options Analysis

Approved for Department of Water and Sanitation:


.....
M MUGUMO
CHIEF ENGINEER: OA (South)


.....
C FOURIE
DIRECTOR: OPTIONS ANALYSIS

Document control record

Document prepared by:

Agrifusion (Pty) Ltd
1 Andringa Street
Stellenbosch
7600

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



Document verified and approved by:

Aurecon South Africa (Pty) Ltd

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1977/003711/07
Aurecon Centre
1 Century City Drive
Waterford Precinct
Century City
Cape Town
7441

PO Box 494
Cape Town
8000
South Africa

T +27 21 526 9400
F +27 21 526 9500
E capetown@aurecongroup.com
W aurecongroup.com

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Author signature		Approver signature	
Name	Gerhard Nel	Name	Erik van der Berg
Title	Associate consultant	Title	Technical Director



DEPARTMENT OF WATER AND SANITATION

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Final: May 2020

Prepared by:

Aurecon South Africa (Pty) Ltd
P O Box 494
Cape Town, 8000
South Africa

Tel: 021 526 5790
Fax: 086 526 9500
e-mail: erik.vanderberg@aurecongroup.com

Prepared for:

Director: Options Analysis
Department of Water and Sanitation
Private Bag X313
Pretoria 0001
South Africa

Mr Menard Mugumo (CE: OA, South)
Tel: 012 336 6838
E-mail: mugumom@dws.gov.za

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Post Feasibility Bridging Study for the Proposed Bulk Conveyance Infrastructure from the Raised Clanwilliam Dam

Reports produced as part of this project are indicated below.

Bold type indicates this report.

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1		Inception Report
2	P WMA 09/E10/00/0417/2	Capacity Building & Training Year 1
3	P WMA 09/E10/00/0417/3	Capacity Building & Training Year 2
4	P WMA 09/E10/00/0417/4	Water Requirements Assessment
5	P WMA 09/E10/00/0417/5	Distribution of Additional Available Water
6		Existing Infrastructure and Current Agricultural Development Sub-Report
7	P WMA 09/E10/00/0417/6	Existing Conveyance Infrastructure and Irrigated Land
8		Suitable Agricultural Areas and Land Ownership Report
9		Evaluation of Development Options Sub-Report
10	P WMA 09/E10/00/0417/10	Suitable Areas for Agricultural Development
11		Right Bank Canal Design Sub-Report
12		Conceptual Design Sub-Report
13		Environmental Screening Sub-Report
14		Jan Dissels and Ebenhaeser Schemes Design Sub-Report
15	P WMA 09/E10/00/0417/13	Feasibility Design
16	P WMA 09/E10/00/0417/7	Topographical Surveys
17	P WMA 09/E10/00/0417/8	Geotechnical Investigations
18	P WMA 09/E10/00/0417/9	Soil Survey
19		Financial Viability of Irrigation Farming Sub-Report
20	P WMA 09/E10/00/0417/11	Agricultural Production and Farm Development
21		Right Bank Canal Cost Analysis Sub-Report
22		Socio-Economic Impact Analysis Sub-Report
23	P WMA 09/E10/00/0417/12	Socio-Economic Impact Analysis
24	P WMA 09/E10/00/0417/14	Record of Implementation Decisions Report
25	P WMA 09/E10/00/0417/1	Main Report
26	P WMA 09/E10/00/0417/15	Historically Disadvantaged Farmers Report

Concise Description of the Content of Study Reports

Report Index	Report Number	Report Title and Description of Content
1		<p>Inception The report forms part of the contract and stipulates the scope of work for the study, the contract amount and the contract period. It contains a detailed description of tasks and methodology, a study programme, human resource schedule, budget and deliverables. The Capacity Building and Training Plan has been included.</p>
2	P WMA 09/E10/00/0417/2	<p>Capacity Building & Training Year 1 Describes the range of capacity building and training activities planned for the study, and the activities undertaken during the first year of the study, including field-based training, training workshop 1 and mentorship of DWS interns through secondment.</p>
3	P WMA 09/E10/00/0417/3	<p>Capacity Building & Training Year 2 Describes the range of capacity building and training activities planned for the study, and the activities undertaken during the second year of the study, including field-based training, training workshop 2 and mentorship of DWS interns through secondment.</p>
4	P WMA 09/E10/00/0417/4	<p>Water Requirements Assessment Provides an analysis of the existing water use and current water allocations in the study area, and addresses ecological water requirements, water use for irrigated agriculture and projections for future use, current domestic and industrial water use and projections for future use, water use for hydropower and water losses in the water supply system.</p>
5	P WMA 09/E10/00/0417/5	<p>Distribution of Additional Available Water Confirms the volume of additional water available for development, after water has been reserved for the current water uses, as well as making recommendations on how the additional yield should be distributed among water use sectors and water users.</p>
6		<p>Existing Infrastructure and Current Agricultural Development Sub-Report Provides an overview of the extent and general condition of the current bulk water storage and conveyance infrastructure. This report also provides an overview of the locality and extent of the existing agricultural areas determined by reviewing Geographic Information System (GIS) data obtained from various sources.</p>
7	P WMA 09/E10/00/0417/6	<p>Existing Conveyance Infrastructure and Irrigated Land An update of the Sub-Report, providing a refinement of the current agricultural water requirements following evaluation of the current crop types, an assessment of the desirability of diverting releases for downstream irrigators via the Clanwilliam Canal and Jan Dissels River, to meet the summer ecological flows in the lower Jan Dissels River, and presents an Implementation Action Plan with costs.</p>

Report Index	Report Number	Report Title and Description of Content
8		<p>Suitable Agricultural Areas and Land Ownership Sub-Report Description of the collection of information and the preparation undertaken for the analysis of options, which includes a summary of existing irrigated areas and water use, cadastral information, land ownership, environmental sensitivity, soils suitability, water quality considerations and constraints, and the initiation of the process to identify additional areas suitable for irrigation.</p>
9		<p>Evaluation of Development Options Sub-Report Describes the salient features, costs and impacts of identified potential irrigation development options for new irrigation development in the lower Olifants River. This provides the background and an introduction to the discussions at the Options Screening Workshop held in December 2018.</p>
10	P WMA 09/E10/00/0417/10	<p>Suitable Areas for Agricultural Development Describes the supporting information, process followed and the salient features, costs and impacts of identified potential irrigation development options for new irrigation development in the lower Olifants River. Recommends the preferred options to be evaluated at feasibility level.</p>
11		<p>Right Bank Canal Feasibility Design Sub-Report Describes the Design Criteria Memorandum, based on best practice in engineering and complying with recognised codes and standards. Description of route alignments and salient features of the new Right Bank canal. Feasibility-level design of bulk infrastructure, including evaluation of capacities, hydraulic conditions, canal design, surface flow considerations, canal structures, power supply and access roads. Operational considerations and recommendations.</p>
12		<p>Conceptual Design Sub-Report Describes the scheme layouts at a conceptual level and infrastructure components to be designed, alternatives to consider or sub-options, and affected land and infrastructure, as well as the updated recommended schemes for new irrigation development.</p>
13		<p>Environmental Screening Sub-Report Describes and illustrates the opportunities and constraints, and potential ecological risks/impacts and recommendations for the short-listed bulk infrastructure development options at reconnaissance level. Describes relevant legislation that applies to the proposed irrigation developments.</p>

Report Index	Report Number	Report Title and Description of Content
14		<p>Jan Dissels and Ebenhaeser Schemes Feasibility Design Sub-Report Describes the Design Criteria Memorandum, based on best practice in engineering and complying with recognised codes and standards. Description of route alignments and salient features of the Jan Dissels and Ebenhaeser schemes. Feasibility-level design of bulk infrastructure, including evaluation of capacities, hydraulic conditions, intake structures, balancing dams and reservoirs, rising mains and gravity pipelines and trunk mains where relevant, power supply and access roads. Operational considerations and recommendations.</p>
15	P WMA 09/E10/00/0417/13	<p>Feasibility Design Description of the approach to and design of selected bulk infrastructure at feasibility level, with supporting plans and implementation recommendations.</p>
16	P WMA 09/E10/00/0417/7	<p>Topographical Surveys Describes the contour surveys for the proposed identified bulk infrastructure conveyance routes and development areas, the surveying approach, inputs and accuracy, as well as providing the survey information.</p>
17	P WMA 09/E10/00/0417/8	<p>Geotechnical Investigations Presents the findings of geotechnical investigations of the various identified sites, as well as the approach followed, field investigations and testing, laboratory testing, interpretation of findings and geotechnical recommendations.</p>
18	P WMA 09/E10/00/0417/9	<p>Soil Survey Describes the soil types, soil suitability and amelioration measures of the additional area covering about 10 300 ha of land lying between 60 to 100 m above river level, between the upper inundation of the raised Clanwilliam Dam and Klaver.</p>
19		<p>Financial Viability of Irrigation Farming Sub-Report Describes the findings of an evaluation of the financial viability of pre-identified crop-mixes, within study sub-regions, and advises on the desirability of specific crops to be grown in these sub-regions. It includes an evaluation of the financial viability of existing irrigation farming or expanding irrigation farming, as well as the identification of factors that may be obstructive for new entrants from historically disadvantaged communities.</p>
20	P WMA 09/E10/00/0417/11	<p>Agricultural Production and Farm Development This report will focus on policy, institutional arrangements, available legal and administrative mechanisms as well as the proposed classes of water users and the needs of each. This would include identifying opportunities for emerging farmers, including grant and other types of Government and private support, and a recommendation on the various options and opportunities that exist to ensure that land reform and water allocation reform will take place through the project implementation.</p>

Report Index	Report Number	Report Title and Description of Content
21		Right Bank Canal Cost Analysis Sub-Report Provides an economic modelling approach to quantify the risk of the failure of the existing main canal and the determination of the economic viability of the construction of the new right bank canal to reduce the risk of water supply failure.
22		Socio-Economic Impact Analysis Sub-Report Describes the socio-economic impact analysis undertaken for the implementation of the new irrigation development schemes, for both the construction and operational phases. This includes a description of the social and economic contributions, the return on capital investment, as well as the findings of a fiscal impact analysis.
23	P WMA 09/E10/00/0417/12	Socio-Economic Impact Analysis Synthesis of agricultural economic and socio-economic analyses undertaken, providing an integrated description of agricultural production and farm development and socio-economic impact analysis, as well as the analysis of the right bank canal costs and benefits.
24	P WMA 09/E10/00/0417/14	Record of Implementation Decisions Describes the scope of the project, the specific configuration of the schemes to be implemented, the required implementation timelines, required institutional arrangements and the required environmental and other approval requirements and mitigation measures, to ensure that the project is ready for implementation.
25	P WMA 09/E10/00/0417/1	Main Report Provides a synthesis of approaches, results and findings from the supporting study tasks and interpretation thereof, culminating in the study recommendations. Provides information in support of the project funding motivation to be provided to National Treasury.
26	P WMA 09/E10/00/0417/15	Historically Disadvantaged Farmers Report Describes the activities undertaken by an independent consultant to evaluate existing HDI Farmers policies and legislative context, identify, map and analyse prospective HDI farmers and potential land for new irrigation, as well as propose a mechanism for the identification and screening of HDI farmers.

Executive Summary

Introduction

The objective of the *Post Feasibility Bridging Study for the Proposed Bulk Conveyance Infrastructure from the Raised Clanwilliam Dam* is to provide recommendations on the bulk conveyance infrastructure required for the equitable distribution of the existing and additional water from the raised Clanwilliam Dam.

The additional water will be used to meet the ecological water requirements of the Olifants River, provide irrigation water to existing irrigators at a higher level of assurance and most importantly support historically disadvantaged farming projects and other broad-based black economic empowerment opportunities.

The main objective of this report is to provide clarity on the proposed farming models related to the uptake of additional irrigation water. In terms of the principle of water allocation reform (WAR), preference should be given to historically disadvantaged individuals (HDIs) when allocation of water is considered. The farming models were developed with this principle in mind. Furthermore, a needs analysis of HDI farmers was done, focusing on the agricultural value chain. This report also includes case studies of both land restitution cases and successful commercial Joint Venture (JV) projects. A balance needs to be found between commercial sustainability on the one hand, and the needs of HDIs and destitute communities on the other. Both objectives need to be addressed to obtain the buy-in from all relevant Government Departments and ultimately to motivate the funding and financing of the scheme.

This report also includes an institutional and funding assessment. Various options for financing public water infrastructure were investigated, and a summary of available grants for financing scheme infrastructure is provided.

Study Area

The study area mainly comprises the Clanwilliam Dam supply area, which is within the Cederberg and Matzikama Local Municipalities, and includes the towns of Clanwilliam, Klaver, Lutzville, and Vredendal. The five sub-areas (also referred to as zones) that will be used in this report, together with the proposed commodities to be developed per sub-area, are shown in **Table E1-1**.

Table E-1-1 | Identified Irrigation Zones and Suitable Commodities

Zone	Location	Suitable commodities
1	Olifants River Catchment upstream of Clanwilliam Dam	<ul style="list-style-type: none"> • Citrus (oranges & soft citrus)
2	Clanwilliam Dam, Olifants River catchment from Clanwilliam Dam to and including Bulshoek Weir	<ul style="list-style-type: none"> • Citrus (oranges & soft citrus) • Table Grapes • Potatoes / wheat in rotation
3	Schemes located wholly outside the Olifants River catchment	<ul style="list-style-type: none"> • Not included in Financial Viability investigation
4	Olifants River catchment from Bulshoek Weir to Lutzville	<ul style="list-style-type: none"> • Table grapes – Trawal • Table grapes – Vredendal • Raisins • Wine grapes • Tomatoes
5	Olifants River Catchment from Klawer to the Coast	<ul style="list-style-type: none"> • Table grapes • Raisins • Wine grapes • Tomatoes • Vegetable seed

The main crops that are recommended for new development are indicated in **Table E1-2**.

Table E-1-2 | Crops recommended for new development

Zone	Location	Suitable Crops
1	Olifants River Catchment upstream of Clanwilliam Dam	Citrus (oranges & soft citrus): recommended
2	Clanwilliam Dam, Olifants River catchment from Clanwilliam Dam to and including Bulshoek Weir	Citrus (oranges & soft citrus): recommended
		Table Grapes: Recommended
		Potatoes / wheat in rotation: Profitable in sub-area 2 - farm expansion
3	Schemes located wholly outside the Olifants River catchment	Not included in investigation
4 and 5	4 - Olifants River catchment from Bulshoek Weir to Lutzville 5 - Olifants River Catchment from Klawer to the Coast	Table grapes – Trawal: Recommended
		Table grapes - Vredendal: Recommended
		Raisins: Recommended
		Wine grapes: Not currently recommended but may become profitable
		Tomatoes / brassica seed in rotation: Not currently deemed profitable, but tomatoes may become profitable

Further to the above, the following preferred irrigation development schemes were identified:

- Jan Dissels;
- Clanwilliam;
- Zandrug;
- Bulshoek;
- Right Bank Canal, inclusive of the Zypherfontein 1, Zypherfontein 2, Trawal and Melkboom irrigation areas;
- Klaver phases 1 and 2
- Coastal 1, and;
- Ebenhaeser.

Needs and Best Approach Analyses

In order to determine the best scenarios for the development of the proposed areas, a needs analysis was performed from the perspective of the smallholder farmer. It was determined that a smallholder farmer would need assistance throughout the value chain for its operations to become commercially competitive.

Scenario 1

Various “best approach options” are recommended for the uptake of water and development of the study area. As per Scenario 1, it may be possible to develop one or more Government Water Schemes (GWSs). In this scenario, the Government would buy or expropriate agricultural land within the target geographical area, and this land will be leased to a Community Property Association (CPA) (or Trust). The CPA would be responsible for productive use of the agricultural land, for such a project to be a success. It should be noted that in terms of the lessons learnt from the Joint Ventures in Land Reform project, CPAs should be provided with legal and administrative support to manage their affairs, including commercial agreements, distribution of benefits and to promote democratic participation of their members.

Strategic partnership / mentorship agreements with the commercial sector should also be in place, to ensure that the whole value chain is serviced in order to ensure high yields, competitive prices and a secure off-take of crops. The way the strategic partner or mentor derives benefit from the project should be scrutinised, to ensure that no exorbitant fees are charged, and that project income reaches the communities. It may be possible for the Citrus and/or Table Grape industry to provide a commitment to such projects, where they in turn receive the fruit produced to be marketed. Although small farm sizes have not been found to be financially viable, a productive unit of 7.5 ha could provide a family with a basic income (e.g. the income of R96 000 p/a for a small vegetable growing unit).

If strategic partnerships or JVs are to be undertaken it is important that the suitable group size be chosen – from past experience, the size of the group has been found to be a significant factor of likely success of a project. Further success factors for JVs require that the strategic partner remains accountable to the project and that the HDIs in the project are involved in the management thereof and enjoy a degree of upskilling, both in terms of technical expertise and in terms of management capabilities.

In addition to the above, support would be needed from the Department of Agriculture, Land Reform and Rural Development (DALRRD) in terms of the Comprehensive Agriculture Support Programme (CASP), from Industry Bodies, from the Department of Water and Sanitation (DWS) in terms of Resource-Poor Farmer Assistance, and from DALRRD in terms of the One Household-One Hectare Project and the Agri-Parks project. Note that the CASP used to be a project of Department of Agriculture, Forestry and Fisheries and One Household-One Hectare used to be from Department of Rural Development and Land Reform. Both Departments have however combined to form the DALRRD. It needs to be determined whether these programmes still hold the capacity to undertake an irrigation project at scale.

Scenario 2

Scenario 2 refers to the allocation of water to the Augsburg Agricultural Gymnasium. Although Augsburg has a relatively small water requirement, the use of additional water by the school will have a positive impact given that it is such an important training and upskilling institution in the area.

Scenario 3

Scenario 3 refers to private development. Private development in this instance refers to commercial development with a black-owned counterpart (51-100% black-owned). This was recommended as the most feasible development option in the *Feasibility Study for the Raising of Clanwilliam Dam*.¹ Private development was also identified as the most feasible option in terms of the Land Reform Panel Report.

Scenario 4

In terms of Scenario 4, Ebenhaeser is provided with substantial water for new development. Provision of water to Ebenhaeser is a priority, as there are many land owners that need water for agricultural development. A practical difficulty is the cost of conveying the water to Ebenhaeser, which is reflected in the high scheme cost. Given that capital repayments will either not be levied against the Ebenhaeser water users (or will be phased in), this scenario would require financial

¹ DWS, 2007

input from Government. Further development in Ebenhaeser would also have the same challenges as the development of a GWS, namely a high reliance on strategic partnerships and Government assistance, but this option should be treated as an important development imperative, give the sheer number of destitute households that need assistance in that area.

Funding of Proposed Schemes

The funding mechanisms from a Government perspective are also discussed in this report. It was found that the strategic nature of South Africa's water resources infrastructure, and the typically long payback periods associated with these investments, imply that a predominantly public sector institutional arrangement is the most appropriate, with money coming from the National Revenue Fund.

Recommendations

In conclusion, this report makes the following recommendations:

1. The *Socio-Economic Impact Analysis Sub-Report* concluded that the availability of additional water from the raised Clanwilliam Dam will have a substantial positive impact on the social and economic conditions prevailing in the area, and that there will be substantial poverty alleviation. This is based on the increased security of supply to existing water users, together with the potential expansion because of new water allocations becoming available. It is important to note, however, that the calculation of the socio-economic benefits was based on the *Financial Viability of Irrigation Farming Sub-Report*. This report, in turn, made use of commercial principles and profitability was proven based on very specific circumstances. Some of the factors include economic viable farm sizes, high yields and good market prices. Should the socio-economic benefits of the scheme be realised, equity objectives need to be aligned with the objectives of commercial viability. For this purpose, the commercial JV model with a shared ownership has been found to be the most feasible option, given that it makes provision for black ownership, but could be commercially viable if the correct safeguards are in place;
2. Development of smaller agricultural units has not been found to be commercially viable, and communal land ownership also has many pitfalls. If models like these were to be successful, considerable inputs from Government, the commercial sector and the HDI communities would be required. The scale of such projects is also important – if the whole of the scheme is developed to smaller agricultural units, the socio-economic benefits of the scheme would not be met. If no such units are developed, it would undermine Government policy that allows for “quick wins” through smaller agricultural units. It is therefore recommended that a balance be found between commercial JV projects and smaller agricultural units. It is for this reason that the recommendation has been made to

develop one or more GWSs in the following areas (smallholder 7.5 ha plots): Jan Dissels, Right Bank Canal and Ebenhaeser schemes.

3. It should however be noted that further study may be needed into the feasibility of schemes for smaller agricultural plots, as the financial viability thereof could not be established within the ambit of this current study. Smaller agricultural units do not possess the economy of scale to compete commercially. Should a few smaller agricultural units be farmed together under a central mentoring agent, the issue of group size and weakened decision-making might surface. The case studies presented in this report also do not support such a centralised structure. At best, smaller agricultural units in Ebenhaeser should be provided with water for the restitution claimants to make a living on their land on a subsistence or smallholder basis. As was mentioned previously in this report, a smaller vegetable growing unit of 7.5 ha could provide a family with an income of approx. R96 000 p/a.
4. The most ideal project structure, based on examination of case studies, would be a JV company with at least 51% black ownership, which either owns the land and the business or just the business. This model may provide for the target of 70% of all allocations to be made to HDIs, if licences are allocated to the HDI component of the JV. The HDI component could be a company or a trust and could use the water rights to “buy in” to the project in question.
5. The JV model could be implemented within any of the irrigation design options. Given that a JV is a private initiative by the commercial sector, it would be up to individual applicants to make proposals for their ideal project structure during the Water Use Licence Application process.
6. Various public water infrastructure financing options were investigated, but it was found that allocation through the National Revenue fund is the most feasible option.
7. The recommended type of development per preferred irrigation development scheme is indicated in **Table E1-3**.

Table E-1-3 | Recommended development per preferred irrigation scheme

Scheme	Hectares	Recommended type of development
Jan Dissels	462	GWS consisting of a combination of commercial farmers and smallholders on state land. Ideal for smallholder development, being located very close to Clanwilliam Town. Proposed 50% smallholder development.
Clanwilliam	298	Private land. Combination of JVs and smallholder farmers.
Zandrug	1 209	Private land. Combination of JVs and smallholder farmers.
Bulshoek	266	Private land. Combination of JVs and smallholder farmers.
Zypherfontein 1 Zypherfontein 2 Melkboom Trawal	710 614 301 510	Private land located in the Trawal area, that can potentially all, or partly be considered for a GWS, in combination with the construction of a new Right Bank canal. The alternative is a combination of JVs and smallholder farmers.
Klaver phases 1 and 2	850	Private land. Combination of JVs and smallholder farmers.
Coastal 1	89	Private land. Combination of JVs and smallholder farmers.
Ebenhaeser	361	63 Ha of Smallholder development and 250 ha for restitution farms (with 12 000 m ³ /ha/a allocations).

Note: 'JVs' in the table above can potentially include the option of black commercial farmers purchasing private land.

- The Jan Dissels and Ebenhaeser schemes could thus ensure the development of about 5% of the total new development for smallholder farmers. Should the Trawal GWS be considered, this will provide a significant opportunity for the development of an additional 5% for smallholder farmers. The development of private land could alternatively be implemented with the premise that a few smaller agricultural units be farmed together under a central mentoring agent, i.e. a JV or black commercial farmer, to meet Government policy for “quick wins” through smaller agricultural units.

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Acronyms

BBBEE Act	Broad-Based Black Economic Empowerment Act
CASP	Comprehensive Agriculture Support Programme
CPA	Communal Property Association
CPAC	Commodity Project Allocation Committee
DALRRD	Department of Agriculture, Land Reform and Rural Development
DBSA	Development Bank of South Africa
DPAC	Departmental Project Allocation Committee
DWS	Department of Water and Sanitation
GEPF	Government Employees' Pension Fund
GWS	Government Water Scheme
HDI	Historically Disadvantaged Individual
JV	Joint Venture
KOBWA	Komati Basin Water Authority
LORGWS	Lower Olifants River Government Water Scheme
LORWUA	Lower Olifants River Water User Association
MAIFSA	Micro Agricultural Financial Institutes of South Africa
MWIG	Municipal Water Infrastructure Grant
NWRS	National Water Resource Strategy
PIC	Public Investment Corporation
PLA Act	Provision of Land and Assistance Act
PPP	Public-Private Partnership
RBIG	Regional Bulk Water Infrastructure Grant
SALA	Subdivision of Agricultural Land Act
SIZA	Sustainability Institute of South Africa
SPV	Special Purpose Vehicle
TCTA	Trans Caledon Tunnel Authority
URV	Unit Reference Value
WAR	Water Allocation Reform
WCDOA	Western Cape Department of Agriculture
WCWDM	Water Conservation and Water Demand Management
WMA	Water Management Area
WSA	Water Services Authority

1 Introduction

1.1 Background

The objective of the *Post Feasibility Bridging Study for the Proposed Bulk Conveyance Infrastructure from the Raised Clanwilliam Dam* is to provide recommendations on the bulk conveyance infrastructure required for the equitable distribution of the existing and additional water from the raised Clanwilliam Dam. The additional water will be used to meet the ecological water requirements of the Olifants River, provide irrigation water to existing irrigators at a higher level of assurance and most importantly support historically disadvantaged farming projects and other broad-based black economic empowerment opportunities.

1.2 Objective of This Report

The *Agricultural Production and Farm Development Report* includes the relevant findings of the *Financial Viability of Irrigation Farming Report*, but also elaborates further on the inclusion of historically disadvantaged individuals (HDI) in the proposed scheme.

The main objective of this report is to provide clarity on the proposed farming models related to uptake of additional irrigation water. In terms of the principle of Water Allocation Reform (WAR), preference should be given to HDIs when allocation of water is considered. In terms of the previous Clanwilliam Dam Raising Feasibility Study, a target of 70% allocation of new water use entitlements to HDIs has been set. The farming models were developed with this principle in mind. Furthermore, a needs analysis of HDI farmers was done, focusing on the agricultural value chain. This report also includes case studies of both land restitution cases and successful commercial Joint Venture (JV) projects. A balance needs to be found between commercial sustainability on the one hand, and the needs of HDIs and destitute communities on the other. Both motivations are needed to obtain the buy-in from all relevant Government Departments and ultimately to motivate the funding and financing of the scheme.

1.3 Methodology

1.3.1 Study Area and Proposed Commodities

The study area mainly comprises the supply area of the Clanwilliam Dam, which is within the Cederberg and Matzikama Local Municipalities, and includes the towns of Clanwilliam, Klaver, Lutzville, and Vredendal. The study area also includes portions of the Olifants River valley upstream of Clanwilliam Dam. Some areas located outside the Olifants River catchment were also considered, such as the Jackals River and coastal towns. **Figure 1-1** below shows a map of the larger Olifants-Doorn Catchment Area, which includes the Cederberg and Matzikama Local Municipalities, and shows the location of key bulk water infrastructure.



Figure 1-1 | The Olifants-Doorn portion of the Berg-Olifants WMA

The *Financial Viability of Irrigation Farming Sub-Report* of this study identified three zones with homogenous water supply options and suitable commodities. These initial geographical areas were chosen based on the recommendations in the *Feasibility Study for Raising of Clanwilliam Dam*, together with further engagements with industry bodies and local farmers to ensure the accuracy and veracity thereof. The *Suitable Areas for Agricultural Development Report* of this study further elaborated upon the various sub-areas and identified five sub-areas. **Table 1-1** below indicates the five sub-areas (also referred to as zones) of the study area that will be used in this report, together with the proposed commodities to be developed per sub-area.

Table 1-1 | Identified Irrigation Zones and Suitable Commodities

Zone	Location	Suitable commodities
1	Olifants River Catchment upstream of Clanwilliam Dam	<ul style="list-style-type: none"> • Citrus (oranges & soft citrus)
2	Clanwilliam Dam, Olifants River catchment from Clanwilliam Dam to and including Bulshoek Weir	<ul style="list-style-type: none"> • Citrus (oranges & soft citrus) • Table Grapes • Potatoes / wheat in rotation
3	Schemes located wholly outside the Olifants River catchment	<ul style="list-style-type: none"> • Not included in Financial Viability investigation
4	Olifants River catchment from Bulshoek Weir to Lutzville	<ul style="list-style-type: none"> • Table grapes – Trawal • Table grapes – Vredendal • Raisins • Wine grapes • Tomatoes
5	Olifants River Catchment from Klawer to the Coast	<ul style="list-style-type: none"> • Table grapes • Raisins • Wine grapes • Tomatoes • Vegetable seed

The financial viability of the identified commodities was determined in the *Financial Viability of Irrigation Farming Sub-Report*, and these findings informed the *Socio-Economic Impact Analysis Sub-Report*. This report builds further on the above, by making recommendations for specific geographical areas and evaluating the impact of various farming models.

1.3.2 Research Approach

The focus of this report is as follows:

- Provide a summary of the feasibility of irrigation farming as a water use: Given that the raising of Clanwilliam Dam and concomitant bulk infrastructure expansions would be a very costly exercise, financially profitable enterprises should make use of the water. The DWS will pay for the capital costs of expansion, but would recover the bulk of these costs from the water users in line with the user-pay principle (National Water Resource Strategy 2, 2013). It is therefore important that financially profitable, effective and efficient enterprises should make beneficial use of the additional water;
- Provide a summary of the feasibility of water uses for HDI subsistence, smallholder and commercial producers: Although financially viable enterprises are needed to make beneficial use of the water, there is an important responsibility on the Department of Water and Sanitation (DWS) to ensure equitable water access and water allocation reform (NWRS1, 2005 and NWRS2, 2013). In support of these outcomes, water should be allocated to HDI irrigation farmers and water users. These individuals typically have smaller farms and do not grow the same capital-intensive crops as commercial farmers do. It is therefore important to comment on financial viability and capability of smaller agricultural units to improve the livelihoods of HDIs, boost equitable water use and promote water allocation reform.
- Determine the various farming models that may be recommended: Various farming models would be used for the various groups of water users, e.g. smallholder farmers, emerging farmers, and commercial farmers. This should also be informed by the findings of the options analysis undertaken, as documented in the *Suitable Areas for Agricultural Development Report*, as this investigated the specific development potential of the various pockets of agricultural land available in the study area. Note that the planning of on-farm irrigation requirements is not part of the scope of this study.
- Investigate available case studies on the inclusion of HDIs: As part of the study investigation, a meeting was held with officials of the DWS Western Cape Regional Office on 2 December 2019, where additional inputs were received regarding case studies.

2 Policy Background

2.1 Key Policy

In this section, the key policies within the DWS will be discussed because they have bearing on the study approach. The current policy environment speaks to water conservation on the one hand, and water allocation reform on the other.

Water infrastructure investment began to decline in the 1990s, as the South African Government increased their share of public consumption expenditure at the expense of public capital investment, brought about by fiscal policies of budget surpluses and debt reduction.

Government policy continues to shape and influence infrastructure investment in South Africa. South Africa's constitutional system of government imposes unique complexities and constraints on infrastructure investment – National Treasury traditionally has a pivotal role in shaping water infrastructure investment. In order to put in place fresh institutional structures and funding models for effective strategies, leading to efficient water infrastructure development, closing the circle between public and private-sector capital is required.²

2.2 Water for Growth and Development Framework

The Water for Growth and Development Framework³ set in motion a course of action to ensure that there is enough water, in both quantitative and qualitative terms, to support South Africa's path of growth and development. In terms of this framework, not only the supply of new water infrastructure, but also the efficiency of existing infrastructure are important factors in the water security of South Africa going forward. The key theme here is water conservation and water demand management (WCWDM).

A major source of water loss is ageing infrastructure exacerbated by poor operations and maintenance at a municipal level. Analysis shows that this is a multi-faceted problem, including a lack of managerial and technical skills and funding. This is important to note, as the condition of

² Ruiters, 2011

³ DWAF. Water for Growth and Development, version 7, 2009

existing infrastructure is an important factor to be considered when the design of new infrastructure is considered.

2.3 National Water Resource Strategies 1 and 2

The First National Water Resource Strategy (NWRS1) outlined some of the key priorities for the water sector, which include WCWDM, equitable allocation of water resources, appropriate institutional arrangements and strengthening regulation.

The Second National Water Resource Strategy of the DWS (NWRS2) states under Infrastructure Development and Management that the DWS will increase the allocation of funds for the maintenance, rehabilitation and refurbishment of government-owned water infrastructure, through a business plan that is subject to approval by National Treasury. The Clanwilliam Dam Raising Project is seen as the refurbishment and expansion of irrigation infrastructure.

The DWS undertakes in the NWRS2 to implement the Social Assessment and Development Framework and to allocate funds available through the Regional Bulk Infrastructure Grant (RBIG) to assist communities that must be served by new water services infrastructure.

The NWA recognises the pivotal role of WCWDM in water resource management, with the objective of enabling all user sectors to gain equitable access to the desired quantity, quality and reliability of water.

Considering the urgency to protect our water resources and the adverse effects of climate change, the NWRS2 submits that WCWDM should be one of the top national priorities. It states that measures need to be put in place to reconcile water requirements and supply in order to provide for the common national goal of a better life for all through job creation and economic growth.

The strategic themes in the NWRS2 address the issues of the protection, use, development, conservation, management and control of water resources and respond to national priorities. Some of the most important themes are listed below:

- i. Theme 1: The availability of water supply infrastructure to meet the social, environmental and economic water use requirements of South Africa. This necessitates water resource planning, development and infrastructure management;
- ii. Theme 3: Equitable allocation of water resources, in order to facilitate the involvement of HDIs in productive economic practices. This would lead to the social and economic empowerment of destitute South Africans;
- iii. Theme 4: The implementation of appropriate WCWDM measures to meet the social and economic needs of South Africa, both now and in the future.

The principles for water resources planning, infrastructure development and management include the following:

- New water resources infrastructure will not be developed or authorised unless effective WCWDM interventions have been put in place in the affected area;
- Groundwater, water reuse, desalination, treated acid mine drainage, rainwater harvesting and WCWDM interventions are, together with surface water resources, recognised and utilised as integral components of South Africa's water resource reconciliation strategies;
- Water infrastructure is developed for multi-purpose use;
- Poor communities in the vicinity of state-owned infrastructure must benefit from that infrastructure; and
- Water infrastructure planning considers the multiple use needs of communities.

The DWS established the Water Allocation Reform (WAR) programme dedicated to redressing inequity and discrimination based on race and gender, as well as poverty eradication. The WAR programme stipulates that water may be set aside in a catchment for HDIs, including black individuals and women. The principles of the Broad-Based Black Economic Empowerment Act, Act 53 of 2003 ("BBBEE Act"), together with the BBBEE Codes of Good Practice of 2007, provide further guidance in this regard. Accordingly, allocations should be focused on black individuals as defined in the BBBEE Act and Regulations, especially black women, disabled individuals and individuals in the 18-35-year-old age group.

South Africa is a water-scarce country and this fact should be a central consideration in the water use authorisation process. This entails that WCWDM plans will have to be developed and submitted as part of water use applications. Individual water use applications should thus outline the extent to which water will be used efficiently and contribute to water allocation reform, which will be a key consideration in the authorisation process.

2.4 National Water Act, Act 36 of 1998

Water use authorisation applicants must take the following considerations into account in terms of Section 27 of the National Water Act (NWA) and motivate accordingly:

- a) Existing lawful water uses;
- b) The need to redress the results of past racial and gender discrimination;
- c) Efficient and beneficial use of water in the public interest;
- d) The socio-economic impact;
- e) Any catchment management strategy applicable to the relevant water resource;
- f) The likely effect of the water use to be authorised on the water resource and on other water users;
- g) The class and the resource quality objectives of the water resource;

- h) Investments already made and to be made by the water user in respect of the water use in question;
- i) The strategic importance of the water use to be authorised;
- j) The quality of water in the water resource which may be required for the Reserve and for meeting international obligations; and
- k) The probable duration of any undertaking for which a water use is to be authorised.

The application of Section 27 will ensure that water use authorisation applications will be considered in the best possible light so that resources are conserved and used in a sustainable manner, in the interest of water allocation reform, with respect to the reserve needed to sustain the ecological conditions within the catchments concerned. Should the infrastructure be upgraded, allocation of water use authorisations under Section 27 will ensure that the objectives of water conservation and water allocation reform are met.

2.5 Subdivision of Agricultural Land Act, Act 70 of 1970

The Subdivision of Agricultural Land Act (SALA) regulates the subdivision and long-term lease of all agricultural land in South Africa. The purpose of the act is to prevent the creation of pieces of agricultural land that are too small to be farmed economically. As SALA is a national act, applications for subdivision are approved by the Department of Agriculture, Land Reform and Rural Development (DALRRD). The Western Cape Department of Agriculture (WCDOA) administers subdivisions in the Western Cape.

Agricultural land is defined as a residual category of several classes of land. It is defined as any land, except the following classes:

- Land of which the State is the owner, or which is held in trust by the State or any Minister for any person;
- Land which the Minister, after consultation with the executive committee of a province concerned, excludes from the provisions of the Act; and
- Several other categories of land, often specific to individual provinces.

All land outside of a municipal boundary, i.e. all land outside municipal areas is regarded as agricultural land. Thus, all farms which traditionally were located outside municipal areas are classified as agricultural land.

A big factor in the approval of subdivisions or long-term leases, is whether the new portion of land would be an “economically viable unit”. The term “economically viable unit” is not defined in SALA, but the economic viability of each unit is determined by the WCDOA. Although each

application is assessed on its own merits, a minimum economically viable unit would be approx. 30-40 ha with enough water rights at an agreeable quota for the area and the proposed crops⁴

Note that SALA has been subject to criticism, cited as an “apartheid-era law”. It is the opinion of the Advisory Panel on Land Reform and Agriculture that this act should be repealed, due to its impact on minimum farm sizes and the principles of co-operative government.⁵

2.6 Provision of Land and Assistance Act, Act 126 of 1993

The Provision of Land and Assistance Act (PLA Act) was enacted to give effect to land reform obligations in terms of Section 25(5) of the Constitution, which mandates land redistribution.⁶ In terms of this act, the Minister of Rural Development and Land Reform is empowered to acquire or designate State land and to develop such land for the purposes of, *inter alia*, small-scale farming, residential, public, community or business purposes. Section 10 of the PLA Act states that the minister shall rely on funding appropriated from Parliament in order to provide financial assistance to such projects.

It is commonly understood that the PLA Act may be used to approve subdivisions of land that may not conform with SALA, if it has the aim of land reform. This position is however also subject to criticism. With reference to court judgements such as *Maccsand vs City of Cape Town*, the question has been raised whether the PLA Act is unconstitutional inasmuch as it sets aside “*The laws governing land use, (and) the subdivision or consolidation of land*”.⁷

At present, however, the PLA Act remains an option that may assist with redistribution of land or private subdivision transactions with a land reform focus. It is however unclear whether the PLA Act would allow the circumvention of SALA. A safe position would be to assume that all subdivisions for agricultural purpose would have to comply with the principles of an “economically viable unit” in terms of SALA.

⁴ Reference: prior discussions with Cor van der Walt of WCDOA (2016)

⁵ Advisory Panel on Land Reform and Agriculture, 2019: 26

⁶ Constitution of the Republic of South Africa, 1996

⁷ *Maccsand v City of Cape Town* (709/10 & 746/10, 23 September 2011)

3 Farming Models

3.1 Financial Viability of Irrigation Farming

The *Financial Viability of Irrigation Farming Sub-Report* determined the financial viability of identified crops within the study area. The report investigated financial viability in terms of the following categories:

- Financial Viability of Existing Irrigation Farming;
- Financial Viability of the Expansion of Existing Farms;
- Financial Viability of New Farms in the Area;
- Financial Viability of New Black-Owned Farms in the Study Area; and
- Financial viability of smallholder farms.

The report found that the development of new irrigation farms seems to be problematic from a financial viability viewpoint. Given the reality of relatively profitable existing farming operations in the various regions of the study area, the major contributing factors to lower profit margins seem to be the expected relatively high capital cost of the development of new farms and the time taken for new plantings to come into full production. It is anticipated that contributions to the capital cost of raising the Clanwilliam Dam and the bulk distribution infrastructure through raised water tariffs may further impact financial viability of farming operations.

It is therefore important to note that the expansion of existing irrigation farms will in general be financially more viable than the development of new irrigation farms, should more irrigation water become available from the raised Clanwilliam Dam. The main reason for this finding is the cost effectiveness of the improved utilisation of infrastructure on existing farms relative to the costly nature of the development of new farms. For expansion of existing farms, citrus and table grapes appear to be profitable. The other crops that were investigated are only deemed profitable in certain circumstances.

An important footnote to this statement is however that the bulk distribution infrastructure downstream of Bulshoek Weir would need to be upgraded by the construction of a new right bank canal, from Bulshoek Weir up to 'Verdeling', where the canal splits, to replace the existing main

canal section. This may impact the cost of water to the existing water users, which in turn may affect financial viability.

The main crops that are recommended for new development are indicated in **Table 3-1**.

Table 3-1 | Crops recommended for new development

Zone	Location	Suitable Crops
1	Olifants River Catchment upstream of Clanwilliam Dam	Citrus (oranges & soft citrus): recommended
2	Clanwilliam Dam, Olifants River catchment from Clanwilliam Dam to and including Bulshoek Weir	Citrus (oranges & soft citrus): recommended
		Table Grapes: Recommended
		Potatoes / wheat in rotation: Profitable in sub-area 2 - farm expansion
3	Schemes located wholly outside the Olifants River catchment	Not included in investigation
4 and 5	4 - Olifants River catchment from Bulshoek Weir to Lutzville 5 - Olifants River Catchment from Klawer to the Coast	Table grapes – Trawal: Recommended
		Table grapes - Vredendal: Recommended
		Raisins: Recommended
		Wine grapes: Not currently recommended but may become profitable
		Tomatoes / brassica seed in rotation: Not currently deemed profitable, but tomatoes may become profitable

When considering the potential of new irrigation land (barring final confirmation), the expansion potential per sub-area can be summarised as shown in **Table 3-2**.

Table 3-2 | New irrigation crop types per study area

Crop type	Sub-area 2	Sub-area 4	Sub-area 5
Hectares	2 739	2 859	463
Citrus (oranges & soft citrus)	60%		
Table grapes	20%	20%	10%
Wine grapes		55%	30%
Raisins		23%	30%
Potato/wheat in rotation	17%		
Tomatoes			29%
Other fruit	3%	2%	1%
Total	100%	100%	100%

The values included in **Table 3-2** above have been used in the socio-economic impact undertaken, as documented in the *Socio-economic Impact Analysis Sub-Report (2019)*. These values can be further refined.

3.2 Proposed Farming Models

Given that the conditions for financial viability of irrigation farming has been established, it is now possible to elaborate further on the proposed farming models, based on the analysis to date and further inputs. In the section below, the proposed farming models will be discussed. These farming models were informed by the guidelines as set out in the Final Report of the Presidential Advisory Panel on Land Reform and Agriculture (referred to as the *Land Reform Panel Report*), which is considered to be the highest authority on land reform farming models to date.⁸ Further inputs from the DALRRD, the DWS and feedback from existing irrigation projects were used to develop the farming models. The proposed farming models were in turn used to develop the best approach options, further informed by the financial viability investigation, the proposed development areas and the value chain requirements of the proposed expansion. Please refer to **Chapter 7** for the best approach options.

The Land Reform Panel Report discusses the viability of various land reform farming models that should be considered. The analysis is done from the perspective of the land owner, namely public land, private land, commonage land or land owned by a community. The viability of farming models in respect of these land ownership structures was investigated. The specific models are unpacked further below.

3.2.1 Group Operations on Communal Land⁹

“Communal land” in this instance refers either to land owned by the Government and leased by a Communal Property Association (CPA) or Community Trust, or land owned by a CPA or Community Trust directly. A CPA could be defined as a juristic person with the power to acquire, hold and manage property on a basis as agreed to by the members of a community in terms of a written constitution.¹⁰ A Community Trust is similar to a CPA, in that property is also held in a trust, but the trust does not conform to the CPA Act. For the purposes of our study, the term “CPA” would be used to refer to both a CPA and a community trust. The specific legal structure of the entity should be considered on an *ad hoc* basis and is therefore not relevant for the purposes of this study.

⁸ Advisory Panel on Land Reform and Agriculture, 2019.

⁹ Advisory Panel on Land Reform and Agriculture, 2019: 120

¹⁰ Communal Property Associations Act, Act 28 of 1996

Communal property ownership does have a purpose within the context of this study, namely to protect land ownership for HDI communities, but in practice there are several issues to be considered. While these are appropriate vehicles for black land ownership, difficulties emerge due to the lack of state support for these institutions as required by the Communal Property Associations Act, Act 28 of 1996.

According to the Land Reform Panel Report, business planning for these projects is lacking which leads to problems with managing labour, input and investment. Further problematic factors include poor incentive to work hard and invest in group ventures, the intricacies of large farming operations, and the need for critical and timely decisions.

A review of land reform projects in the North West Province confirms the problems canvassed above.¹¹ Surveys were conducted amongst land reform projects in 2005 and again in 2010, and the data was compared. The success of projects was investigated based on the number of individual participants. Successful projects were deemed to be those that have a stable production, or those that show an increase in production. See a summary of the findings in **Table 3-3** below.

Table 3-3 | Success of land reform projects based on group size

Number of participants	Success rate
Less than 5	78%
6-10	50%
11-20	44%
21-50	38%
More than 50	33%

According to the study, the main reason for unsuccessful projects is conflict within the group. This leads to the conclusion that the bigger the number of land reform beneficiaries in a project, the greater the chance of conflict which may hamper project success. This finding is important to note, not only for CPAs or community trusts, but also when the number of beneficiaries or shareholders for other farming models are considered.

Projects on communal land may act as a safety net for the poor and increase food security. Examples of successful subsistence farming communities on communal land exist in Mexico, Brazil and Malawi. A problem with communal ownership however is that communal land could not be used as security for obtaining access to credit. This limits the financial viability of such projects and creates a reliance on grants or other forms of institutional support for farming

¹¹ Kirsten et al., 2014 as per Land Reform Panel Report

success. It is doubtful whether projects of this kind will lead to increased household income and food security. According to the Land Reform Panel Report, low output from communal projects has an impact on total agricultural output and value adding, which negatively impacts economic growth.

3.2.2 Individual Smallholder Farmers on Land Owned by Government¹²

In terms of this model, the state would buy land under the Pro-Active Land Acquisition Strategy (PLAS) and then lease the land to individual smallholders under the conditions of the State Land Lease and Disposal Policy.

Land acquisition via PLAS has proven to be very inefficient as land could be bought at rates that far exceed a fair market value. Further difficulty with this model is that production finance could not be obtained easily. Formal financial institutions would generally require that security needs to be provided in the form of a bond against immovable property. The timing of access to funds in terms of CASP or the Micro Agricultural Financial Institutes of South Africa (MAIFSA) is also an issue, namely that access to these funds may be delayed or are not secured at all.

The chance of success in a project like this is also low, unless operational funds are made available immediately when a lease is awarded in terms of PLAS. According to the Land Reform Panel Report, all beneficiaries should receive written lease agreements within at least five years.

3.2.3 Individual Smallholders on Land Not Owned by Government¹³

This scenario may lead to increased employment, agricultural production and growth, based on both local and international examples. It includes individual smallholders on privately owned land, which is rented or leased from a private land owner. In this instance, the rights to the land are provided on a contractual basis. Permitted that the constraints to production finance are dealt with, this may be a viable option. Mentorship agreements and contracts for secure off-take of produce would further assist such projects to become successful.

Alternatively, the smallholder farmer would be the individual operator as well as the land owner. This option would be ideal, given that access to finance could be secured, since security could be provided. Although access to finance could increase vulnerability and risk, this risk could be mitigated by creating strong links throughout the agricultural value chain. This would include links with agribusinesses, input providers and financiers, as well as solid off-take agreements.

¹² Advisory Panel on Land Reform and Agriculture, 2019: 121

¹³ Advisory Panel on Land Reform and Agriculture, 2019: 121

3.2.4 Individual Commercial Operations on Land Not Owned by Government¹⁴

This is the landholding model for commercial agriculture. The land is owned by private entities and operated by the same entity, or the land is owned by a private entity and leased to a separate operational company. Variations of this structure may be used for commercially viable black-owned businesses. Global experience indicates that this model is highly appropriate for commercial farms of all sizes. The reason is that work, management and investment incentives are all aligned because of the private profit objective of the project. When the business is profitable, it is also able to provide financial assistance to farm workers in the form of housing, schools, medical assistance, transport, retirement savings, etc. Note that commercial producers for an export market must comply with various consumer protocols like the Sustainability Initiative of South Africa (SIZA) and Fairtrade, which also includes socio-economic compliance for the assistance mentioned above.

The amount of post-settlement support needed under this model depends on the size and beneficiaries of the commercial operation. Small farms settled with poor beneficiaries will need support with extension support from DALRRD, marketing, and start-up and investment grants, which they may supplement with credit.

3.2.5 Summary

A summary of the various models is given in **Table 3-4**, indicating the land ownership, best application and viability of each.

Table 3-4 | Merits and viability of different land reform models

#	Model name	Land ownership	Best application	Viability
1	Group operations on communal land	HDI community	Protecting land ownership for HDI communities	Viable for communal grazing Large scale operations viable if secure long-term leases are in place
2	Individual smallholder farmers on land owned by Government	Government	PLAS projects	Not viable - leaseholders rarely get ownership
3	Individual smallholder farmers on land not owned by Government	HDI farmers / non-HDI farmers	HDI farmers to lease land from non-HDI farmers	Highly viable for both small- and large-scale commercial farms
4	Individual commercial operations on land not owned by Government	HDI farmers / non-HDI farmers	Commercial operations	Highly viable for both small- and large-scale commercial farms

¹⁴ Advisory Panel on Land Reform and Agriculture, 2019: 122

4 Study Area Analysis

The farming models mentioned in Chapter 3 will assist in providing a template for development of the study area. In this chapter, the study area will be elaborated upon in order to determine the best approach options in Chapter 7. For this reason, the various geographical areas and the needs or capabilities of each, the various groups of water users, including smallholder and subsistence farmers, and the assistance available or needed for projects to be successful, will be discussed.

4.1 Opportunities Per Geographical Area

The *Suitable Areas for Agricultural Development Report* discussed the various options for development of the study area in detail, taking into consideration bulk water infrastructure needs. Several options were *inter-alia* recommended for further (feasibility) investigation. These potential schemes will be discussed below (inclusive of further evaluation outcomes), together with an explanation of the potentials and pitfalls of each development scheme for agricultural development.

4.1.1 Jan Dissels Scheme

The scheme includes potential irrigation land of 462 ha, located South-East of Clanwilliam town in the Jan Dissels River Valley. This consists of a greenfields irrigation portion, as well as a smaller area of existing irrigation, located on both sides of the Jan Dissels River. The land is government owned and may *inter-alia* provide significant potential for smallholder (7.5 ha) agricultural plots. The Jan Dissels River Valley is also close to Clanwilliam town, which makes it ideal for accessing formal and informal markets. The scheme's power supply could be augmented from a proposed new hydropower plant at the raised Clanwilliam Dam, should the hydropower plant be constructed.

This scheme is ideal for the development of farms to the benefit of HDIs. Refer to **Figure 4-1** for an aerial photograph of the Jan Dissels Scheme and the proposed bulk water infrastructure. It is a financially attractive scheme.



Figure 4-1 | Layout of the Jan Dissels Scheme

4.1.2 Clanwilliam Scheme

The identified irrigable areas for this scheme are located very close to the Clanwilliam Dam on the Western side. Irrigators can pump water directly from Clanwilliam Dam. The irrigable area is estimated at 298 ha. There is existing irrigation in the area, with an existing scheduled allocation. This scheme has a good location and a medium unit reference value (URV). There is also potential for 7.5 ha plots as it is located close to Clanwilliam town, although located on private land. This scheme (refer to **Figure 4-2**) also lends itself to the development of own schemes for directly pumping from Clanwilliam Dam. This provides opportunities for black-owned commercial irrigators or Joint Venture development in this area.

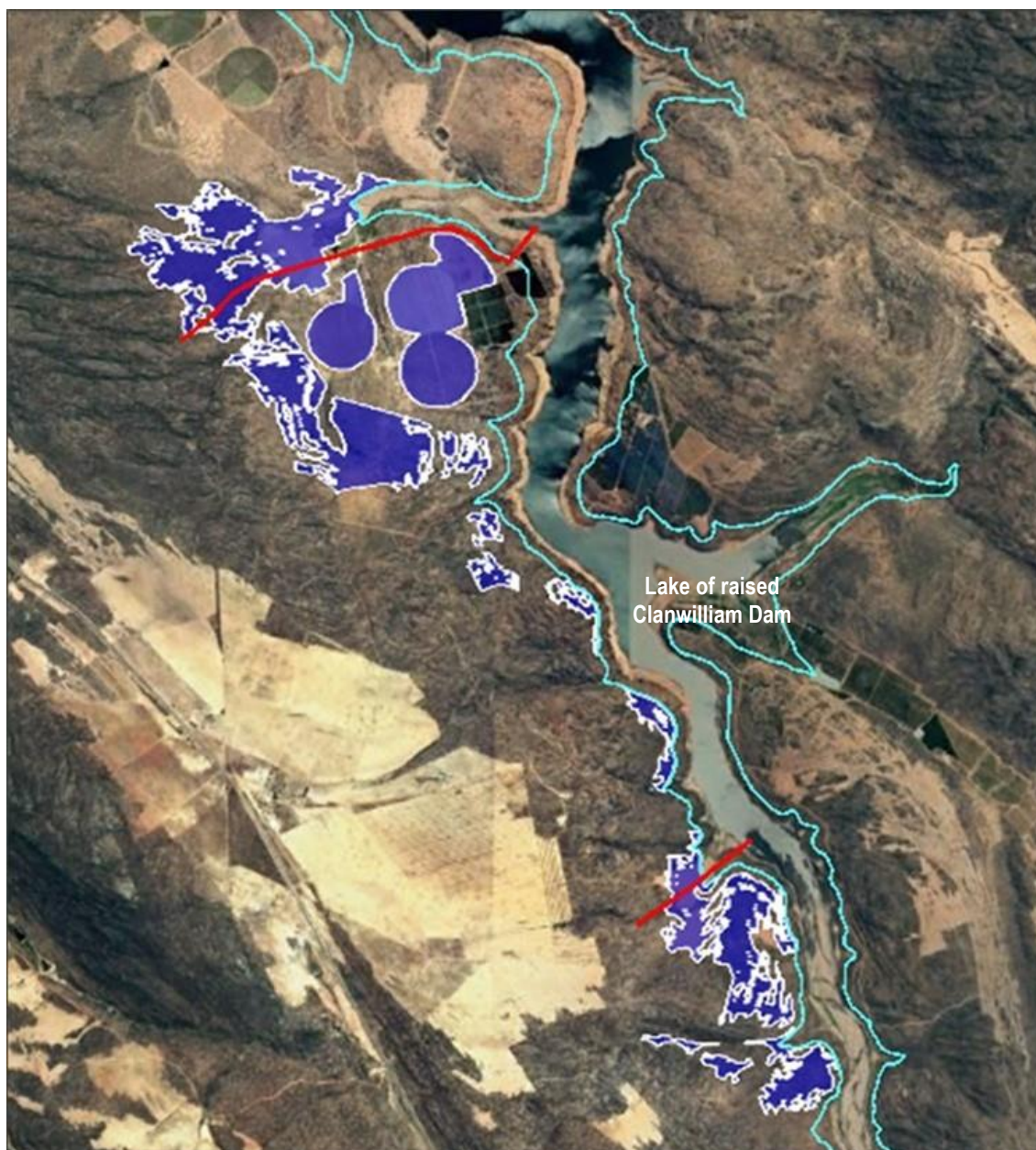


Figure 4-2 | Layout of the Clanwilliam Scheme

4.1.3 Zandrug Scheme

The southern portion of this potential irrigation area (**Figure 4-3**) is located 3 km from Clanwilliam town. There is a potential for smallholder plots of 7.5 ha, considering the proximity of the area to Clanwilliam town and existing formal and informal markets. Water would be pumped from the Olifants River to farm dams, with irrigation under gravity. The land is privately owned, and the assumed irrigable area is 1 209 ha, but this will be significantly influenced by the extent of existing irrigators' willingness to change a portion of the existing irrigation (mostly potato/wheat) to higher-value crops. The scheme has a good location and is a financially attractive scheme, but there are environmental concerns related to new development. There are no water quality concerns and the water losses are very low.



Figure 4-3 | Layout of the Zandrug Scheme

4.1.4 Bulshoek Scheme

For this scheme (Figure 4-4), irrigators could pump water directly from the lake of the Bulshoek Weir, although abstraction points will be affected by the rise and fall of the water level. There are also existing crop fields located in the identified area. The irrigable area is 266 ha, which will be influenced by the extent of existing irrigators' willingness to change a portion of the existing irrigation (mostly potato/wheat) to higher-value crops. The environmental impacts for this scheme are of medium significance, but it is noted that botanical and freshwater impacts should be considered, which may impact available land and irrigation infrastructure. The scheme however has a good location and is financially attractive, there are no water quality concerns and water

losses are low. This scheme also lends itself to private water schemes for irrigation development, which may suit black commercial farmers or Joint Ventures.



Figure 4-4 | Layout of the Bulshoek Scheme

4.1.5 Right Bank Canal Scheme

This scheme (**Figure 4-5**, indicating a preliminary canal route) involves the replacement of the main (Trawal) canal section with a new canal on the right bank of the Olifants River. The Trawal section of the canal poses the biggest risk to the downstream irrigators, and this scheme is aimed at mitigating that risk. The new canal would be sized to allow for all current and future existing Lower Olifants River Government Water Scheme (LORGWS) irrigation flows, as well as the new

irrigation areas in the Trawal area (Zypherfontein 1, Zypherfontein 2, Trawal and Melkboom irrigation areas) and new irrigation development further down the Olifants River valley. The combined assumed irrigable area for the four new areas is 2 339 ha. This scheme has a good location and a medium URV, although there are moderate opportunity costs as a result of the moderately-high water losses. Environmental concerns are moderate and there are no water quality concerns. The potential need for additional drainage to mitigate impacts on lower-lying irrigation areas have not yet been included in the cost estimates. This scheme will provide the benefit of significantly reducing the risk of failure of the whole LORGWS and removing the first bottleneck caused by the current limiting capacity of the Trawal canal section. The scheme would however only be viable if funding for betterment work is secured.

The Right Bank canal lends itself to both black commercial or Joint Venture projects (e.g. Trawal and Melkboom) and subsistence and smallholder farming Government Water Schemes (GWSs) (e.g. Zypherfontein 1 and 2), although is not located close to towns.



Figure 4-5 | Layout of the Right Bank Canal Scheme

4.1.6 Klawer Scheme, Phases 1 and 2

This phased development scheme (**Figure 4-6**) involves the use of spare flow capacity in the right bank distribution canal, both before (Phase 1) and after (Phase 2) the completion of the new Right Bank main canal. The size of the scheme for Phase 1 is determined by the extent of the canal flow that can be routed to and abstracted from the Karoovlakte canal section, passing through flows destined for the Ebenhaeser Scheme.

For this scheme, irrigators could pump water from the canal section during weeks with surplus flow in the Karoovlakte canal section, into a small balancing dam adjacent to the canal, and from there to a large balancing dam. The area that can be irrigated is 412 ha for Phase 1 and 438ha for Phase 2. Significantly more land is available for irrigation, if water could feasibly be conveyed to the area.

This scheme has low environmental concerns. Water quality will vary from ideal to acceptable. There is some concern of the effect of the additional head on the integrity of the existing canal sections as a result of the increased flow.

This scheme may hold potential for the development of 7.5 ha plots, given its relative closeness to Vredendal.

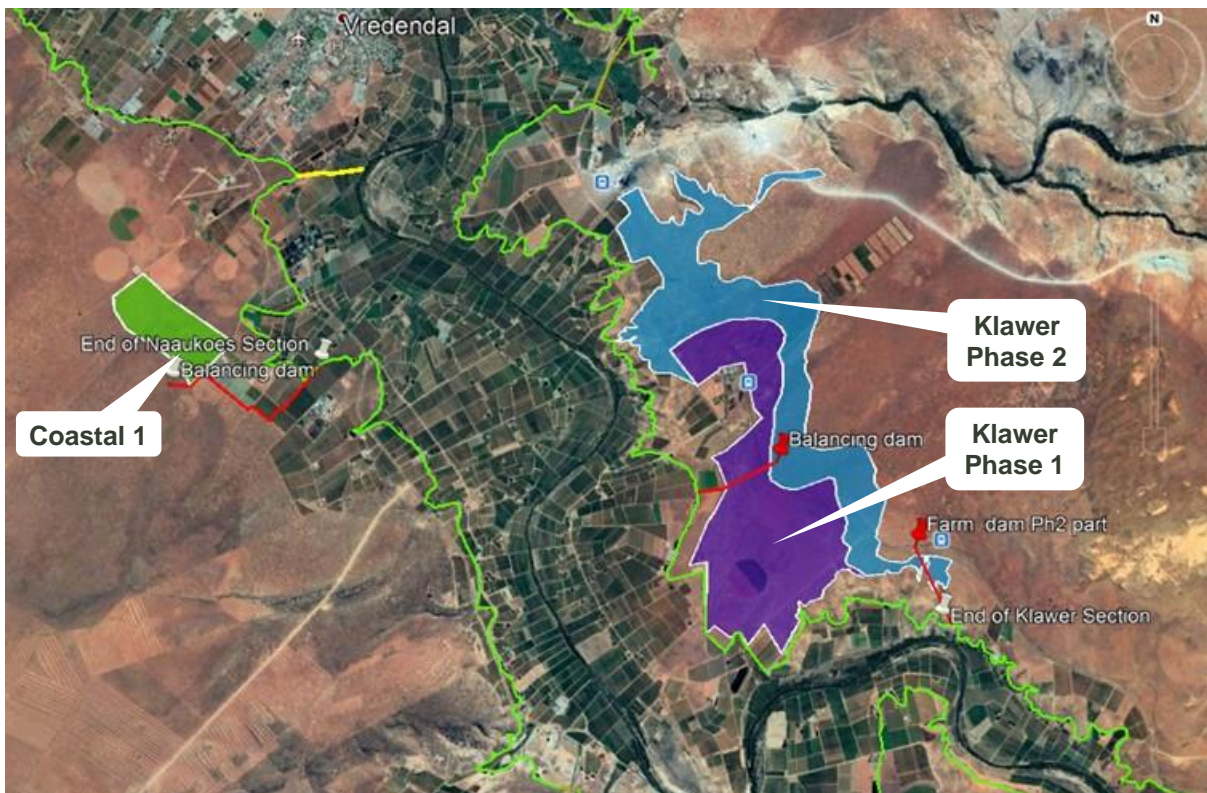


Figure 4-6 | Klawer and Coastal 1 schemes areas

4.1.7 Coastal 1 Scheme

This scheme (**Figure 4-6**) involves the use of spare flow capacity in the left bank distribution canal, following the completion of the new Right Bank main canal. The size of the scheme is determined by the extent of the canal flow that can be routed to and abstracted from the end of the Naaukoes canal section, passing through flows destined for the Ebenhaeser Scheme.

For this scheme, irrigators could pump water from the canal section during weeks with surplus flow in the Naaukoes canal section, to a large balancing dam. The area that can be irrigated is 89 ha. Significantly more land is available for irrigation, if water could feasibly be conveyed to the area.

This scheme has low environmental concerns. Water quality will vary from ideal to acceptable. There is some concern of the effect of the additional head on the integrity of the existing canal sections as a result of the increased flow.

This scheme may hold potential for the development of 7.5 ha plots, given its relative closeness to Vredendal.

4.1.8 Ebenhaeser Scheme

The existing Ebenhaeser Community Project is located approximately 12 km from Lutzville. Ebenhaeser is scheduled under LORWUA for 257 ha of water use entitlements, which needs to be distributed to 153 plots (1.68 ha each) plus a commercial farmer with 8.6 ha. The water is delivered to an existing balancing dam at the end of the canal system. A pumped scheme to deliver the water under pressure is currently being constructed.

The successful land claim lodged by the Ebenhaeser Community has resulted in thirteen farm parcels being handed over to the Ebenhaeser Community Project Association during March 2019, with further farms to be handed over in the future. These farms have a need for additional water, and some land parcels have no water allocation at all. Five water requirement clusters to augment the supply to restitution farms have been identified, that will use 80% of the scheme's water supply, with an area of 250 ha that can be irrigated, at an allocation of 12 000 m³/ha/a, to match that of surrounding commercial farms. The remaining 20%, which is a total of 62 ha, will be used for expansion of the Ebenhaeser Community Project irrigation area. Significantly more land is available for irrigation, if water could feasibly be conveyed to the area.

For this development scheme, irrigators could pump water from the canal sections during weeks with surplus flow, from the end of the Vredendal canal section on the left bank canal, as well as from the Retshof canal section of the right bank canal, to a large balancing dam on the left bank. The balancing storage includes a volume of 150 000 m³ to be used by the LORWUA for stabilising

the operation of the lower sections of the right and left bank canals. From the balancing dam, water will be pumped to a reservoir and gravitated to the irrigators.

This scheme has low environmental concerns and a high cost. Water quality will vary from ideal to acceptable. High water losses will be experienced, because of very high canal losses and a high leaching requirement, although losses will decrease once the Right Bank canal has been built. This scheme has high opportunity costs because of high water losses.

This scheme, albeit relatively expensive, provides an opportunity to meet the needs of the Ebenhaeser community, both for incremental provision of water to farms handed over to the community in terms of a successful restitution process, as well as to augment the existing community project. **Figure 4-7** shows the proposed irrigation land and required bulk water infrastructure.

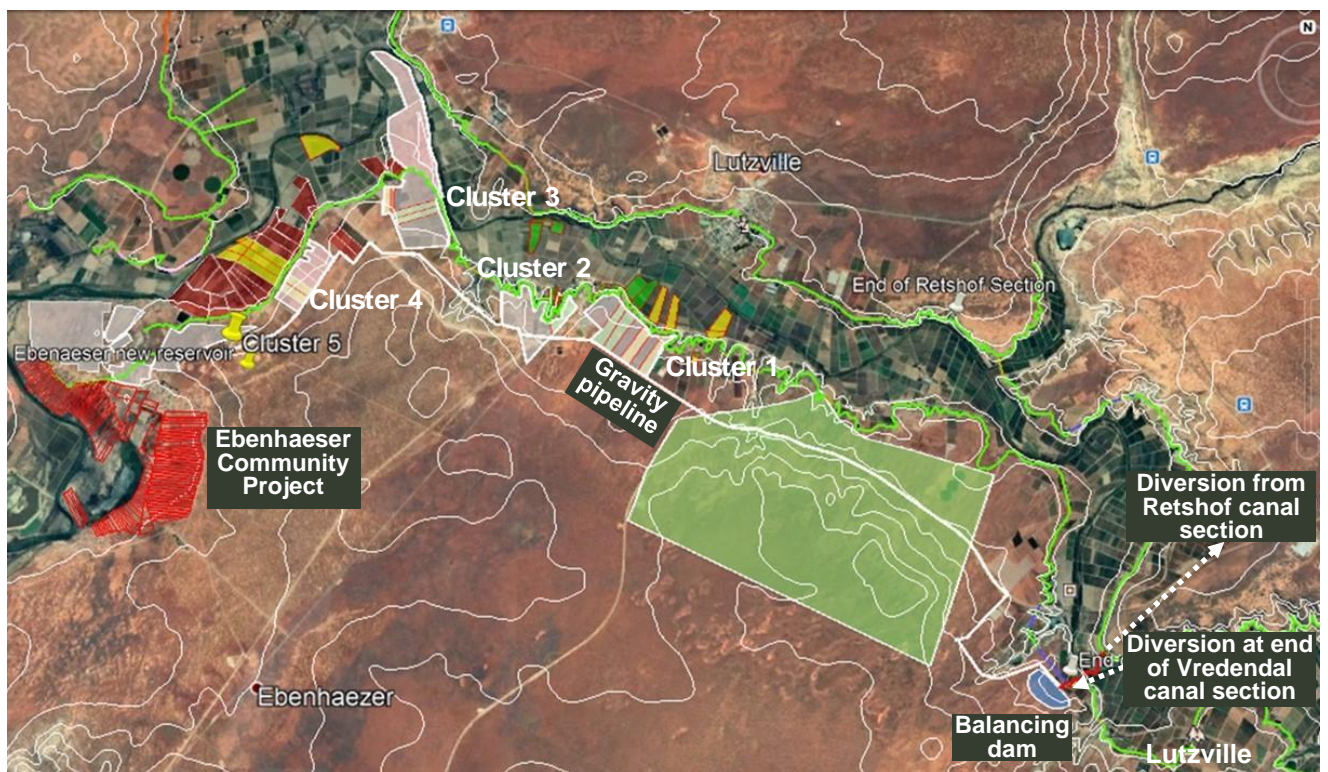


Figure 4-7 | Layout of the Ebenhaeser Scheme

4.2 Scheme Recommendations

DWS has approved that the feasibility design of three recommended schemes should proceed, as part of this study, namely the Jan Dissels River, Right Bank Canal and Ebenhaeser schemes.

The preferred scheme upstream and including Bulshoek Weir (Jan Dissels, Clanwilliam, Zandrug and Bulshoek schemes) will require less intensive design work, as the only bulk water infrastructure required are rising mains and balancing dams. From the balancing dams, water

will either gravitate to the proposed agricultural land, or further private irrigation infrastructure would be required.

The required on-farm irrigation infrastructure was considered in the *Financial Viability of Irrigation Farming Sub-Report*, especially for new developments. It is envisaged that smallholder farmers and government water schemes would also require additional on-farm water infrastructure. On-farm water infrastructure would mostly include pipelines and balancing dams, similar to the bulk water infrastructure required, but on a smaller scale. On-farm developments do not form part of this study, as these cannot be investigated at this stage, given the high uncertainty regarding the specific parcels of land that will be developed at farm level (pending detailed farm planning), as well as the detailed environmental impacts and mitigation measures required. Factors that could not be addressed at present include the environmental impact of new developments, and the fact that on-farm irrigation design will likely only be done once it is certain that additional irrigation water would become available and be affordable in the short to medium term.

From a smallholder farming perspective, the models showed that the current average farm sizes are ideal to compete in a commercial market. The farm sizes required for various crops are as follows:

- Citrus: 90 ha;
- Table grapes: 50 ha;
- Wine grapes: 64 ha;
- Raisins: 64 ha;
- Potatoes: 90 ha; and
- Tomatoes: 50 ha.

Under certain circumstances smaller agricultural units could be competitive, but only if consistent high yields are produced and/or land, implements and irrigation infrastructure are provided by means of grant assistance. It has been indicated that such plots have been found to be unviable from a smallholder farming perspective as is mentioned below. The possibility however exists for such projects within the design of the Jan Dissels, Clanwilliam, Zandrug, Right Bank Canal, and Ebenhaeser schemes.

From a subsistence and smallholder perspective, it was found that an agricultural unit in Ebenhaeser could potentially provide the farmer with an income of over R8 000 per month, if irrigation infrastructure and implements are covered by grants, and the growers possess the inputs, skills and expertise to produce commercial-grade yields. This finding could also be extrapolated to other areas that may be able to receive new water use allocations, e.g. municipal commonage schemes or other peri-urban or subsistence farming operations. The possibility exists to develop government water schemes for the specific purpose of subsistence and

smallholder HDI farming, especially in respect of the Jan Dissels, Right Bank Canal, and Ebenhaeser schemes.

Given that the viability of smaller agricultural units could not be established, the following chapter will provide an explanation of the sources of assistance that may be available to smallholder farmers, in order to determine whether further potential could be unlocked.

From a commercial perspective, the production of citrus and table grapes by HDIs on new farms could be profitable in the study area, if land is provided at no cost. A possibility exists to develop suitable areas with these crops at scale. Raisins, tomatoes and wheat could also be profitable, if high yields are produced.

Note that the recommendations in this Chapter do not fully explore the financial implications of the proposed developments to the benefit of subsistence and smallholder HDI farmers. The HDI farming models mentioned have not been found to be commercially competitive, which means that their development would also not make sense from a planning perspective. The reason for this is that the proposed socio-economic benefits of the scheme, which is an important motivating factor to unlock funding from National Treasury, were based on the premise that all agricultural developments would be commercially competitive. If a large portion of the developments are not commercially competitive, the socio-economic benefits would not be realised. This may impact on the desirability of funding the proposed developments. This issue will be elaborated on further in Chapter 7 (Best Approach Options).

5 Needs analysis for smallholder farmers

In this Chapter, the various sources of assistance that may be available to subsistence and smallholder farmers are discussed. An analysis would be needed of most of the elements of the agricultural value chain, including input supply, technical production assistance, grants, loans, marketing assistance and satisfaction of export and consumer protocols in order to become competitive. **Figure 5-1** provides an illustration of a typical agricultural value chain.

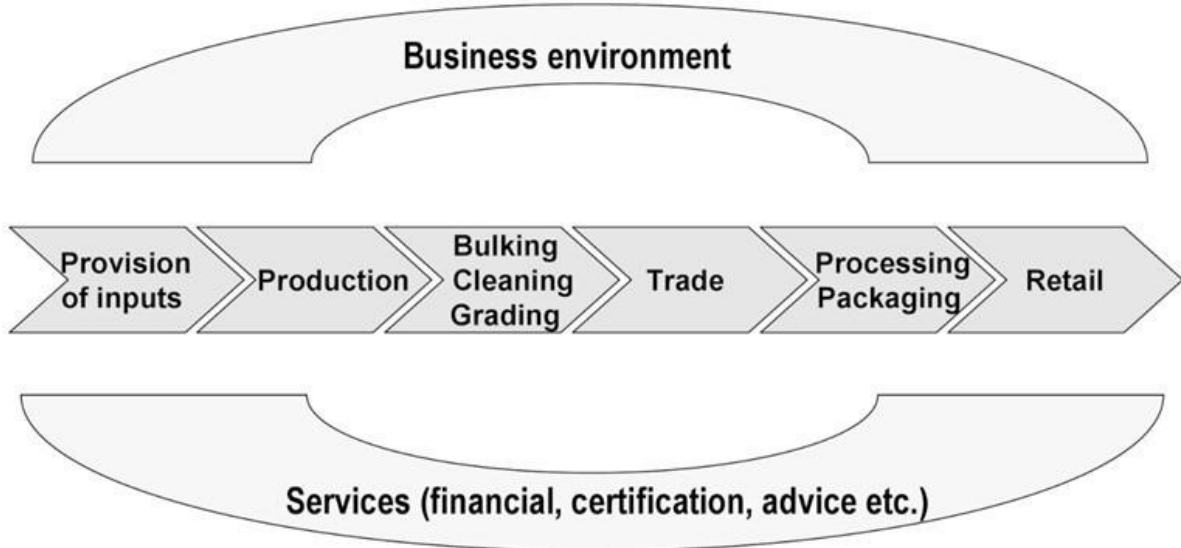


Figure 5-1 | Typical Agricultural Value Chain

Each of the elements in the agricultural value chain is discussed below, clustered under separate headings.

5.1 Provision of Inputs

Most agricultural inputs could be viewed as consumables, which are needed to ensure crop growth per season. This includes pesticides, fertilizers and seed. It also includes the packaging

materials where crops are processed or packed on farm.¹⁵ Tools and implements could also be grouped under inputs.

Inputs are mostly purchased from farming co-operatives or special dealers. Given that the volume of inputs may be high, and the inputs must be stored on-farm before use, proper recordkeeping is important. For the purchasing of production inputs, it is important that smallholder farmer operations are located close to major towns in the study area. This has been noted for the various zones comprising the study area (refer to discussion on Options in Chapter 4). In the commercial agricultural sense, inputs must be purchased on a production loan or similar credit facility, which is to be paid back within a relatively short timeframe. This poses a problem for smallholder farmers, as they may not possess enough security to ensure that loans are available to them.

The Comprehensive Agriculture Support Package of DALRRD may provide grant support to smallholder farmers for the purchasing of certain agricultural inputs, including implements. This is regarded as indispensable for the success of smallholder farmers, as many of them are not able to procure loans to purchase inputs.

Industry bodies are also assisting with providing funds towards the aims of CASP, through the vehicle of the Commodity Project Allocation Committees (CPACs) and the Departmental Project Allocation Committees (DPACs). Various CPACs exist for the fruit industry, the citrus industry, the table grape industry, etc. It is understood that industry bodies contribute towards projects identified via the CPACs, by means of allocating a portion of export levies for such a purpose. These funds could then be allocated to HDI projects via CASP. Note that other sources of funding (not only inputs) may also be available from industry bodies through the CPACs, DPACs and CASP.

5.2 Production including Land and Water

The production portion of the value chain constitutes most on-farm activities. Before production can even start, the development project would need enough agricultural land with enough water rights. The models of communally-owned land have been discussed in Chapter 3, but the salient issue remains to be the mechanism by which land will be bought on behalf of the smallholder farmers or leased to them, given that smallholder farmers do not possess access to credit on a large enough scale.

Regarding water access, the Resource-Poor Farmer Assistance (RPF Assistance) programme of the DWS may assist farmers to procure various forms of assistance related to water access.

Table 5-1 indicates the various forms of assistance, together with a description of each.

¹⁵ AgriSETA, 2006: 9

Table 5-1 | Resource-Poor Farmer Assistance

Resource-Poor Farmer Assistance Programmes¹⁶	
Name of Grant	Description
Capital Cost of Water Distribution Infrastructure	A contribution to the capital cost of off-farm bulk water distribution infrastructure.
O&M, WRM and Depreciation charges	A contribution to the Operation & Maintenance, Water Resource Management and Depreciation charges levied from the water user by the DWS
Acquisition of Water Allocations	Assistance with obtaining water use licence authorisations, specifically for water users that will form part of a GWS or WUA
Socio-economic Viability Studies of Schemes	Assistance with socio-economic viability studies for the development of irrigation schemes
Training of Management Committees	Assistance with training of Resource-Poor Farmers to become part of management committees, e.g. WUAs
Rainwater Tanks for Household Productive Use by the Poor	Contribution to the capital cost of construction of storage tanks for rainwater harvesting and related works.

As could be seen in **Table 5-1** above, there are several options available to “resource-poor” farmers as defined in the policy. Limited resources however currently remain within the DWS to follow up on this policy, and very limited grants were paid out since the inception of the policy. During a meeting with Thembisa Torch of the DWS in December 2019, it was reported that the Resource-Poor Farmer Assistance programme has been transferred to the Regional Bulk Water Infrastructure Grant (RBIG) within Government. This would assist management of the policy and may lead to more funds becoming available in terms of the policy.

5.3 Packing and Cold Storage

The value chain elements of bulking, cleaning, grading, processing and packaging are grouped together as “packing and cold storage”. In the study area, there are mostly private facilities for packing and cold storage, and smallholder farmers would need access to these facilities if they are to become commercially competitive. For most subsistence farmers, packing and cold storage is non-existent, as the produce gets consumed on farm after harvest. For smallholder farmers, access to packing and cold storage is key, however there are limited facilities servicing smallholder farmers at acceptable rates. Proximity to market is also an important factor here.

The Department of Rural Development and Land Reform (now DALRRD) has initiated an Agri-Parks project. An Agri-Park is defined as a networked innovation system of agri-production,

¹⁶ Department of Water Affairs and Forestry, 2004

processing, logistics, marketing, training and extension services located in district municipalities. As a network it enables the growth of market-driven commodity value chains and contributes to the achievement of rural economic transformation. An Agri-Park is subdivided into Farmer Production Support Units with a primary production focus, Agri-Hubs and Rural Urban Market Centres.¹⁷ An Agri-Park is planned for the West Coast District, but at present this Agri-Park is not in existence yet.

Should a functioning Agri-Park exist for the West Coast District, it may be able to assist smallholder farmers with packing and cold storage which would in turn allow them market access and increased profitability. It is however recommended that the success of the Agri-Parks initiative be evaluated before it could be determined whether it is a model that could be implemented.

5.4 Trade and Marketing

Marketing and trading of produce is a key element in the agricultural value chain, as the sale of produce is the source of income for agricultural operations. Many commercial producers already have agreements for the secure off-take of their products, which decreases risk to a large degree. Smallholder farmers however do not necessarily enjoy a secure off-take, as they may not be able to produce the volumes required, at the quality required, in order to be commercially competitive. Commercial marketing institutions may also charge fees which the smallholder farmers may not be able to pay.

There is thus a big need for centralised marketing to the benefit of smallholder farmers. As mentioned in Par. 5.3 above, the Agri-Parks model may aid smallholder farmers for the marketing of their produce, if they become operational.

5.5 Finance, Export Protocols and Advice

Smallholder farmers would need access to finance to become commercially profitable, including capital loans, production loans and revolving credit. The problem however is that they do not possess enough assets to provide security for such credit. This hampers their ability to be competitive.

Export protocols also require stringent compliance to various safety, environmental and other standards, which may be impossible for smallholder farmers to adhere to on their own.

Lastly, smallholder farmers mostly need advice, either in the form of extension services from the WCDOA or other advice in the form of mentorship agreements with commercial producers.

¹⁷ Department of Rural Development and Land Reform, 2016

6 Lessons from Other Projects

In this section, available case studies on land reform projects are discussed, in order to learn from them for the development of projects within the study area.

6.1 Land restitution projects

Three case studies on the successes and failures of land restitution projects are discussed below.

6.1.1 Levubu Case Study¹⁸

The Levubu River is a tributary of the Limpopo River, and the Levubu Valley is situated East of the town of Makhado (formerly Louis Trichardt) in the Limpopo Province. Prior to 1994 land ownership in the Levubu Valley was reserved for white people. The African population of the area was gradually removed from the best agricultural land, and their assistance mainly used as labour on the white-owned farms.

Virtually the entire irrigated area in the valley, which is more than 400 properties, has been reclaimed by local communities under the Restitution of Land Rights Act between 2004 and 2008. The communities constituted various tribal entities, which have been all formally established as CPAs or trusts. The farms in question are mainly planted with perennial fruit orchards, although sizeable areas were also used for annual crops such as cabbage, maize and sweet potatoes.

The various projects were managed in terms of strategic partnerships, and the push came from the Regional Land Claims Commissioner in Limpopo, working with the Restitution Support branch of the provincial Department of Agriculture. The communities also expressed the need for strategic partnerships, as they argued that they must not be saddled with elaborate enterprises that they are unable to manage effectively. The state agencies proposed that a single company, South African Farm Management (SAFM), controlled by the Boyes Group, would become the strategic partner for all the claimant properties in the Levubu Valley. SAFM was set up specifically to engage in such partnerships by established white interests in the agricultural sector and new

¹⁸ Lahiff, Dacis and Manenzhe, 2012

black empowerment partners. The Regional Land Claims Commissioner subsequently selected a second company, Mavu Management Services (Mavu), formed by several white farmers in Levubu, with individual black partners, as a second strategic partner for the Levubu claimants. SAFM proceeded to manage five claimants, and Mavu the remaining two claimants. By 2007, however, a new strategic partner replaced the SAFM and Mavu, namely Umlimi Holdings.

From the outset, the farms were reportedly in poor condition due to neglect by previous owners, largely due to delays in release of purchase payments by the State and consequent delays in transfer of ownership to the communities. Initial harvests were below optimal, due largely to the lack of maintenance and necessary investment. While wages and agricultural inputs were available, no funds were available for new plantings or long-term investments. By late 2009, the farms were in serious financial trouble and by 2010; the management company was bought out by the community.

The ongoing difficulties experienced by the communities and the failure of financial benefits to materialise over a five-year period, contributed to growing tensions within the communities.

The restitution process at Levubu has restored large areas of land to its original owners. The high-value activities based on the land have, however, posed enormous challenges to the new owners, who lacked access to capital and technical expertise. Interventions by the state agencies responsible for restitution and post-settlement support, led to the consolidation of holdings into large centralised units and the introduction of strategic partners. Without exception, the communities' experience of strategic partnerships was negative – productive capacity on the farms was run down, jobs were lost, state grants were expended with little benefit, and the communities were saddled with large debts. Both the strategic partners and the communities were vocal in their criticisms of the state agencies involved. The failures were due to the imposition of an elaborate and untested commercial model, excessive delays in the release of development grants and the lack of monitoring the performance of the projects (and even appreciating the need thereof).

6.1.2 Moletele Case Study¹⁹

The Moletele community is in the South-Eastern portion of the Limpopo province. The Moletele community enjoyed communal customary rights, which were reduced to beneficiary occupation rights under Apartheid. The Community launched a Land Claim in 2003, of which only 10% was transferred by 2012. Initial experiments with joint ventures involving former land owners gave rise to major difficulties, especially around access to working capital, with two out of three projects collapsing. Unlike Levubu, where development grants were exhausted, and communities left with

¹⁹ Lahiff, Dacis and Manenzhe, 2012

large debts, the problem at Moletele was that the bulk of the grants was never actually provided by the State although it was promised. This has, however, led to the negotiation of new community-private partnerships with better-resourced commercial partners.

Granting exclusive control of commercial operations to external partners makes such deals more attractive to commercial partners and the banks. From the perspective of the community leadership, participation in all aspects of commercial operations remains the ideal, but there is a growing awareness that the community is not well prepared for this role and that full joint ventures may not actually be workable under current conditions. While profitability and the need for investment are uppermost in the minds of community leaders and their business partners, the ordinary membership is undoubtedly more concerned with the delays in distributing any material benefits among the community.

In summary, the Moletele case study shows the importance of commercial involvement on the one hand and taking the needs of the community into account on the other. The community may not be able to understand the requirements of commercial viability, therefore communication with project beneficiaries becomes very important.

6.1.3 Amangcolosi Community Trust

The Amangcolosi community is situated in Kranskop in KwaZulu-Natal. In 2004, about 401 families were successful with a land claim through the Commission on Restitution of Land Rights. Over the years, this community was able to build a successful business, called Ithuba Agriculture, which employs at least 500 people from the area. The land is owned by the Amangcolosi Community Trust, and the business is owned by Ithuba Agriculture. The business was initially operated in a JV structure with a strategic partner, Crystal Holdings (Pty) Ltd. The strategic partnership with Crystal Holdings (Pty) Ltd has since ended, but Ithuba Agriculture is still a successful business in the sugar cane industry.²⁰

Despite the challenges faced, Amangcolosi Community Trust and Ithuba Agriculture are regarded as a success due to the following factors:

- a. Good, fertile land in a “land reform-friendly industry”;
- b. Strong JV partnership; and
- c. Strong and united leadership, including support from the traditional authority in the area.²¹

²⁰ Tekie, 2016

²¹ Tekie, 2016: 87

According to Amy Tekie of the University of the Witwatersrand, the trust did manage to avoid most of the factors leading to failure. Please refer to the quote below:

“The farms were managed through Ithemba Agriculture, a separate legal entity, rather than through the Trust itself (which often leads to entangled finances and reporting structures, insufficient technical capacity, and failed farming operations). Even if the decision-making did not meet the ideal standard of democracy, members were sufficiently involved and informed to retain their support for the Trust. As the farms were run commercially, and the land not accessible to claimants for individual use, the issue of claimant rights and benefits was simpler. The right human resource systems were in place and there was enough unity of purpose amongst the leadership to avoid significant conflict. Crystal Holdings (Pty) Ltd helped to bring management skills, and some of the Trustees had business experience as well; furthermore, they had the foresight to identify and engage the current CEO due to his financial expertise.”²²

This case study of the Amangcolosi Community Trust is unique, as it shows that a land restitution project could be successful within a JV structure where HDI land ownership is protected.

6.2 Joint Venture Projects

Three examples of successful JV projects are discussed below. Note that these examples are not based on detailed case studies, but rather on the consultant’s understanding of the industries in question and available online information.

6.2.1 Bosman Adama (Pty) Ltd and Adama Wines (Pty) Ltd

Bosman Family Vineyards in Wellington empowered their workers and families through the Adama Appollo Workers Trust. The Adama Appollo Workers Trust holds a 26% ownership in Bosman Adama (Pty) Ltd, while Bosman Family Vineyards holds 74%. Bosman Adama (Pty) Ltd owns 500 ha of land, the Bosman Wines cellar and a vine nursery. Another project, Adama Wines (Pty) Ltd, is a black-women owned wine label that is produced in the Bosman Wines cellar.

The Adama Wines project is a good example of a successful commercial JV project, especially given its vertical integration in the wine value chain. Not only do the HDIs draw benefit from on-farm activities, but also the cellar, nursery and marketing of a unique black-owned wine label. Black-owned wines are an emerging sector in the wine industry, one which should also be explored in the study area.

6.2.2 De Goree Farming (Pty) Ltd

The De Goree Farming project is a JV between the De Goree Employees’ Trust and Van Loveren Vineyards (Pty)Ltd. The De Goree Employees’ Trust holds 52% ownership, while Van Loveren Vineyards holds 48% ownership. The project started in 2006 and includes 116 HDIs that are also

²² Tekie, 2016: 86

employed by Van Loveren Vineyards. De Goree Farming owns the land of 138 ha and the operating business. A long-term supply contract is in existence between De Goree Farming and Van Loveren Family Cellar. This means that all produce enjoys a secure off-take and allows for access to more segments of the wine value chain.

The project earned the national AgriBEE project of the year award for 2008, and the National Landcare Award for clearing of alien vegetation in 2009. The farm also obtained Fairtrade accreditation in 2009. It should be noted that this project is still in existence, some 14 years after its inception. The vineyards are likely in full production which allows for maximum dividends to the 116 beneficiaries.

Note that the De Goree Workers Trust was formed in 2006, when so-called “broad-based” empowerment trusts were supported by Government. Broad-based trusts typically include many beneficiaries. While this position is still supported by Unions, the current trend in JVs is to focus on smaller groups of beneficiaries, hence allowing for more benefit per individual.²³

6.2.3 Zandberg Citrus Landgoed (Pty) Ltd

Zandberg Citrus Landgoed (Pty) Ltd is an empowerment project in the study area. The company is 50% owned by Suiderland Plase (Pty) Ltd, and 50% owned by the Zandberg Trust. The Zandberg Trust represents 49 beneficiaries that are permanent employees of Suiderland Plase. Zandberg Citrus Landgoed (Pty) Ltd bought a farm of 250 ha from Suiderland Plase, which purchase was funded in equal amounts by Suiderland Plase and the Zandberg Trust. The trust obtained a grant from the DRDLR (now DALRRD) for the transaction.

This project is a good example of a successful application of DALRRD funds to purchase both land and shares in a commercial business. During stakeholder engagements as part of this study, representatives of Zandberg Citrus Landgoed were present, and attested to the success of their project.

6.3 Conclusions

Both the Moletele and the Levubu case studies represent unsuccessful projects. While they were not successful, they may provide insight why certain models worked or not. The Moletele case study acknowledges the need for commercial involvement to ensure competitiveness, while the Levubu case illustrates clearly how such models were largely untested at the time and led to various pitfalls. One of the more important aspects may be that the projects in these case studies were undertaken on a large scale, with community-wide involvement. The later Land Reform

²³ As per discussions with Prof. Mohammad Karaan of the University of Stellenbosch

Panel Report confirmed that smaller groups have a much bigger chance of success than the community-wide projects.

The Amangcolosi case study is helpful, as it provides a good example of a land restitution project with a successful commercial agricultural focus. For this project a JV structure was used to get the project off the ground, but it is understood that the commercial partner had left the partnership due to allegations of fraud. Despite this fact, the project is still successful.²⁴ Important success factors include suitability of the crop and location, strength of the JV partnership before its demise and strong leadership (including support by the tribal authority).

Bosman Adama (Pty) Ltd, De Goree Farming (Pty) Ltd and Zandberg Citrus Landgoed (Pty) Ltd are good examples of successful JV projects with a commercial focus. Their structures are similar, namely that a private company owns the land and the production business, an HDI trust receives benefit and the project is integrated into the whole of the agricultural value chain.

Note that all three of the above examples were formed when so-called “broad-based” empowerment trusts were supported by Government. Broad-based trusts typically include many beneficiaries. While this position is still supported by Unions, the current trend in JVs is to focus on smaller groups of beneficiaries, hence allowing for more benefit per individual.²⁵

Note that the BBBEE Commission needs to audit all BBBEE transactions with a value of more than R25 million. The BBBEE Codes has strict rules for accepting a trust as a vehicle in a broad-based ownership scheme and to avoid circumvention of the Codes. This includes excisable voting rights, and that economic interests and net value remain in the hands of black people as a result of direct or indirect participation in the measured entity (refer to Statement 100, Annexures (B)-(D) of the BBBEE Codes of Good Practice for more detail). According to the BBBEE Commission, of the 341 ownership transactions submitted to it for registration from 9 June 2017 to December 2018, 33% involved broad-based structures in the form of Trusts, Broad-Based Ownership Schemes and Employee Share Ownership Schemes. When assessed against the ownership rules, most schemes did not meet the requirements as set out in the Codes.

If strategic partnerships or Joint Ventures are to be undertaken, it is important that a suitable group size be chosen, that the strategic partner remains accountable to the project, and that the HDIs in the project are involved in the management thereof and will enjoy a degree of upskilling, both in terms of technical expertise and in terms of management capabilities.

The author of the Amangcolosi case study mentions research from the Centre for Applied Social Research (UK) which identifies factors contributing the success and failure of land reform projects.

²⁴ IDC, 2016

²⁵ As per discussions with Prof. Mohammad Karaan of the University of Stellenbosch

Please refer to the list of factors in **Table 6-1** below, together with additional factors as were identified in the case studies.

Table 6-1 | Factors contributing to land reform success and failure

Factors contributing to success	Factors contributing to failure
Skilled and experienced leadership and good communication	Attempts to manage business enterprises under communal management
Active participation of claimant structure in project steering committees	Project steering committees that close out participation of members
Availability and utilisation of settlement planning and discretionary grants	Inappropriately structured and supported legal entities
Sustained support from Government and NGOs	Unclear determination of individual rights and benefits
Strategic partnerships, special purpose vehicles, mentoring and appointment of managers	Lack of clarity about roles and responsibilities leading to conflict
Avoiding delays in hand-over of productive farms to new beneficiaries	Lack of management and financial skills to run commercial enterprises
Vertical integration in the value chain in question	Poor quality / inadequately monitored service provisions

In Chapter 7 below, the lessons learnt in this chapter regarding the successes and pitfalls of empowerment projects will be applied to this study.

7 Best Approach Scenarios

In Chapter 3 of this report, the financial viability and various land reform farming models were discussed. Chapter 4 provided insights into the geographical areas, and the potential of each, while Chapters 5 and 6 provided insight into ideal assistance needed for HDIs and proposed project structures. This Chapter provides options for the implementation of Water Allocation Reform in the study area.

7.1 Scenario 1: Development of New Government Water Schemes

This scenario entails the development of one or more GWSs. This could be for subsistence and smallholder farming, but also for commercial farming. The Jan Dissels River and Ebenhaeser schemes to be designed are very suitable for the development of smallholder agricultural plots (7.5 ha each), but the irrigation areas associated with the Right Bank Canal Scheme less so. According to Mr Ernest Malatsi of DALRRD²⁶, the prioritisation of options for a potential GWS should be based on the following:

- Irrigable soils;
- Proximity to targeted groups to minimise traveling costs;
- Access to irrigation infrastructure;
- Cost of water;
- Proximity to available infrastructure such as roads, markets, etc.

The identified options for a potential GWS were chosen based on these criteria. The Jan Dissels, Right Bank Canal and Ebenhaeser schemes will proceed to feasibility design as part of this study. For the purposes of this study, the desirability of a GWS in general will be focussed on.

In this scenario, the Government would acquire agricultural land within the target geographical area, and this land will be leased to a CPA (or Trust). The CPA would be responsible for productive use of the agricultural land, for such a project to be a success. It should be noted that

²⁶ DAFF, 2019

in terms of the lessons learnt from the JVs in Land Reform projects, CPAs should be provided with legal and administrative support to manage their affairs, including commercial agreements, distribution of benefits and the promotion of democratic participation of their members.

Strategic partnership / mentorship agreements with the commercial sector should also be in place, to ensure that the whole value chain is serviced in order to ensure high yields, competitive prices and a secure off-take of produce. An example of this required arrangement could be the JV agreement in the Amangcolosi case study. The way the strategic partner or mentor derives benefit from the project should be scrutinised, to ensure that no exorbitant fees are charged, and that project income reaches the communities. It may be possible for the Citrus and/or Table Grape industry to provide a commitment to such projects, where they in turn receive the fruit produced to be marketed. Although small farm sizes have not been found to be financially viable, a productive unit of 7.5 ha could provide a family with a basic income (e.g. the income of R96 000 per annum for a small vegetable growing unit).

If strategic partnerships or Joint Ventures are to be undertaken it is important that a suitable group size be chosen, that the strategic partner remains accountable to the project, and that the HDIs in the project are involved in the management thereof and enjoy a degree of upskilling, both in terms of technical expertise and in terms of management capabilities.

In addition to the above, support would be needed from the DALRRD in terms of CASP and the One Household- One Hectare Project and from DWS in terms of Resource-Poor Farmer Assistance. It needs to be determined whether these projects still hold the capacity to undertake an irrigation project at scale.

It is important to understand that developing a new GWS with smaller plots has not been found to be financially viable, because smaller plots themselves have not been found to be viable. Therefore, support and/or subsidies are required to ensure continuity of such a project. If a large portion of the scheme is developed to smaller plots, the socio-economic benefits of the scheme would not be realised. Given this reality, it is recommended that a smaller portion of water rights should be allocated to smallholder farmers. The balance of water rights may have to be taken up by commercial projects with a part black ownership, in order to ensure profitability. This will assist the socio-economic benefits of the scheme to be realised. It is therefore recommended that about 10% of the total new irrigation area be reserved for smallholder farmers, which is expected to amount to about 100 smallholder farmers. These can form portions of new irrigation developments.

7.2 Scenario 2: Provision of Water to Augsburg Agricultural Gymnasium

The Augsburg Agricultural Gymnasium is a key training and upskilling institution in Clanwilliam. During the stakeholder workshops of June 2019, they indicated their willingness to institute an out-grower project to the benefit of HDIs. This may be a key project in the training of farm workers in the area, but further detail needs to be confirmed with the school.

7.3 Scenario 3: Provision of Bulk Irrigation Infrastructure for Private Development

Private development in this instance refers to commercial development with a black-owned counterpart (51-100% black-owned). This was recommended as the most feasible development option in the *Feasibility Study for the Raising of Clanwilliam Dam*.²⁷ Private development was also identified as the most feasible option in terms of the Land Reform Panel Report.

The three JV case studies, mentioned in Chapter 6, are good examples of black-owned projects that are also commercially viable. The land could be owned by the company with the black shareholding or by a separate company and leased to the project. If the land is owned by a separate company, this company could be either black-owned or non-black-owned. Given that most of these projects are for new development, the company is structured in such a way that the water use authorisation is seen as a capital contribution to the project, which allows for black ownership from the project outset (e.g. 51%). Many of these projects also make provision for an increase in black ownership of up to 100%, if further contributions could be made on behalf of the entity holding the black ownership (e.g. by means of grants or other contributions). A mentorship agreement would also be in place for provision of technical assistance, and the involvement of a commercial partner also ensures that the whole value chain is serviced, and a secure off-take could be guaranteed.

As was mentioned in Chapter 6, the BBBEE Commission views a private company structure in a positive light, where the HDI beneficiaries are in fact shareholders of the company. Further to this, the empowerment of smaller groups of individuals has been found to be ideal.

7.4 Scenario 4: Ebenhaeser

Provision of water to Ebenhaeser is a priority, as there are many land owners that need land or additional water for agricultural development. A practical difficulty is the cost of conveying the water to Ebenhaeser, which is reflected in the high scheme cost. Given that capital repayments will either not be levied against the Ebenhaeser water users (or will be phased in), this scenario

²⁷ DWS, 2007

would require financial input from Government. Further development in Ebenhaeser would also have the same challenges as the development of a GWS, namely a high reliance on strategic partnerships and Government assistance, but this scheme should be treated as an important development imperative, given the sheer numbers of destitute households that need assistance in that area.

Currently DALRRD has a caretaker agreement with the Ebenhaeser community, and Stellar Winery has a mentorship agreement with certain Ebenhaeser farmers, as well as an agreement for off-take of their wine grapes. This type of positive involvement, from both Government and the private sector, would be needed to make any smaller agricultural plots a success.

8 Institutional and Funding Assessment

8.1 Scope of the Institutional Assessment

A brief assessment was performed of the various structures available to finance bulk water infrastructure projects. This excludes on-farm infrastructure, which is considered to fall outside of bulk water infrastructure.

For the purposes of this institutional assessment, it is important to distinguish between the concepts of infrastructure financing and funding. The definitions used for this project are:

- **Financing:** Financing refers to managing cash-flow related to infrastructure development. It is concerned with raising the capital required to enable the initial investment in infrastructure; and
- **Funding:** Funding refers to the payment for infrastructure. It relates to paying for that capital (over time) as well as the subsequent operating costs required to sustain the infrastructure.

The institutional options must enable the financing of various types of infrastructure and different sources of capital finance, each of which may have different requirements related to funding by water users (tariffs), the fiscus (taxes) or external grants (transfers). Furthermore, the institutional options must reflect government's fundamental principles related to water management, fiscal prudence and institutional viability.²⁸

8.2 Options for Financing Infrastructure Investment

Various alternative structures were investigated that could be used to finance capital infrastructure investments. These structures will not be explained in detail, as most innovative infrastructure financing options rely on sectors with a higher profitability (and hence repayment ability) than agricultural water users.

The following options were investigated:

²⁸ Pegasys, 2014: 2

- DWS Infrastructure with Fiscal Support: This option refers to the “standard” means of financing infrastructure, namely through an allocation from the National Revenue Fund;
- Ring-Fenced Projects with Commercial Funding: A Special Purpose Vehicle (SPV) is created, with which to raise money from alternative sources, e.g. commercial loans, bonds, and development finance loans (World Bank, DBSA, etc.);
- Public-Private Partnerships with Shared Equity: A SPV is created, with a shared ownership between Government and financiers. The financiers obtain equity in the project and would also expect high returns on their investment.

The conclusion is however made that, due to the strategic nature of South Africa's water resources infrastructure and the typically long payback periods associated with these investments, a predominantly public sector institutional arrangement is the most appropriate (namely an allocation from the National Revenue Fund).²⁹

8.3 Potential Funding Mechanisms

Table 8-1 below provides a summary of potential infrastructure financing and cost recovery options. Although the most feasible option remains an allocation from the National Revenue Fund, the various options should be presented in order to provide a clear picture of the public infrastructure investment landscape.

²⁹ Pegasys, 2013

Table 8-1 | Potential Funding and Cost-Recovery Sources

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 HDI 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 wastewater 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 	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 ("SPVs") 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"> SPVs need to be set up, e.g. TCTA 	SPV

9 Conclusion and Recommendations

The *Agricultural Production and Farm Development Report* includes the main findings of the *Financial Viability of Irrigation Farming Report*, but also elaborates further on the inclusion of HDIs in the proposed scheme. The main objective of this report is therefore to provide clarity on the proposed farming models related to the uptake of additional irrigation water, together with the affordability of the scheme for all water users and all other elements that should be considered, i.e. support throughout the entire agricultural value chain.

These findings include lessons from other successful projects, where a balance needs to be found between commercial sustainability on the one hand, and the needs of HDIs and destitute communities on the other. Both objectives need to be met to obtain approval from all relevant Government Departments and ultimately to motivate for the funding and financing of the scheme.

The main recommendations of this report are the following:

1. The *Socio-Economic Impact Analysis Sub-Report* concluded that the availability of additional water from the raised Clanwilliam Dam will have a substantial positive impact on the social and economic conditions prevailing in the area, and that there will be substantial poverty alleviation. This is based on the increased security of supply to existing water users, together with the potential expansion because of new water allocations becoming available. It is important to note, however, that the calculation of the socio-economic benefits was based on the *Financial Viability of Irrigation Farming Sub-Report*. This report, in turn, made use of commercial principles and profitability was proven based on very specific circumstances. Some of the factors include economically viable farm sizes, high yields and good market prices. Should the socio-economic benefits of the scheme be realised, equity objectives need to be aligned with the objectives of commercial viability. For this purpose, the commercial JV model with a shared ownership has been found to be the most feasible option, given that it makes provision for black ownership, and could be commercially viable if the correct safeguards are in place;
2. Development of smaller agricultural units has not been found to be commercially viable, and communal land ownership also has many pitfalls. If models like these were to be

successful, considerable inputs from Government, the commercial sector and the HDI communities would be required. The scale of such projects is also important – if the whole of the scheme is developed to smaller agricultural units, the socio-economic benefits of the scheme would not be met. If no such units are developed, it would undermine Government policy that allows for “quick wins” through smaller agricultural units. It is therefore recommended that a balance be found between commercial JV projects and smaller agricultural units. It is for this reason that the recommendation is made to develop GWSs (that include 7.5 ha plots) inclusive of the Jan Dissels and Ebenhaeser schemes. In addition, a GWS can be considered in the Trawal area, associated with the proposed implementation of the new Right Bank canal.

3. It should however be noted that further study may be needed into the feasibility of schemes for smaller agricultural plots, as the financial viability thereof could not be established within the ambit of this current study. Smaller agricultural units do not possess the economy of scale to compete commercially. Should a few smaller agricultural units be farmed together under a central mentoring agent, the issue of group size and weakened decision-making might surface. The case studies presented in this report also do not support such a centralised structure. At best, smaller agricultural units in Ebenhaeser should be provided with water for the restitution claimants to make a living on their land on a subsistence or smallholder basis. As was mentioned previously in this report, a smaller vegetable growing unit of 7.5 ha could provide a family with an income of approximately R 96 000 p/a.
4. The most ideal project structure, based on examination of case studies, would be a JV company with at least 51% black ownership, which either owns the land and the business or just the business. This model may provide for the target of 70% of all allocations to be made to HDIs, if licences are allocated to the HDI component of the JV. The HDI component could be a company or a trust and could use the water rights to “buy in” to the project in question.
5. The JV model could be implemented within any of the irrigation design options. Given that a JV is a private initiative by the commercial sector, it would be up to individual applicants to make proposals for their ideal project structure during the Water Use Licence Application process.
6. Lastly, various public water infrastructure financing options were investigated, but it was found that allocation through the National Revenue fund is the most feasible option.
7. The recommendation per preferred irrigation development scheme is indicated in **Table 9-1**.

Table 9-1 - Recommended development per preferred irrigation scheme

Scheme	Hectares	Recommended type of development
Jan Dissels	462	GWS consisting of a combination of commercial farmers and smallholders on state land. Ideal for smallholder development, being located very close to Clanwilliam Town. Proposed 50% smallholder development.
Clanwilliam	298	Private land. Combination of JVs and smallholder farmers.
Zandrug	1 209	Private land. Combination of JVs and smallholder farmers.
Bulshoek	266	Private land. Combination of JVs and smallholder farmers.
Zypherfontein 1 Zypherfontein 2 Melkboom Trawal	710 614 301 510	Private land located in the Trawal area, that can potentially all, or partly be considered for a GWS, in combination with the construction of a new Right Bank canal. The alternative is a combination of JVs and smallholder farmers.
Klaver phases 1 and 2	850	Private land. Combination of JVs and smallholder farmers.
Coastal 1	89	Private land. Combination of JVs and smallholder farmers.
Ebenhaeser	361	63 Ha of Smallholder development and 250 ha for restitution farms (with 12 000 m ³ /ha/a allocations).

Note: 'JVs' in the table above can potentially include the option of black commercial farmers purchasing private land.

8. The Jan Dissels and Ebenhaeser schemes could thus ensure the development of about 5% of the total new development for smallholder farmers. Should the Trawal GWS be considered, this will provide a significant opportunity for the development of an additional 5% for smallholder farmers. The development of private land could alternatively be implemented with the premise that a few smaller agricultural units be farmed together under a central mentoring agent, i.e. the JV or black commercial farmer, to meet Government policy for “quick wins” through smaller agricultural units.

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Aurecon South Africa (Pty) Ltd

1977/003711/07

Aurecon Centre
1 Century City Drive
Waterford Precinct
Century City
Cape Town
7441

PO Box 494
Cape Town
8000
South Africa

T +27 21 526 9400

F +27 21 526 9500

E capetown@aurecongroup.com

W aurecongroup.com

