

Impact Assessment report:

TOWARDS COMMERCIALIZATION OF LACHENALIA

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ACRONYMS AND ABBREVIATIONS

ARC:	Agricultural Research Council of South Africa
Bulbils:	Small bulbs developed from leaf cuttings
CBS:	Dutch Central Bureau for Statistics
DLV:	Dutch Agricultural Information office
DST:	Department of Science and Technology
DTI:	Department of Trade Industry
Eurostat:	European Bureau for Statistics
GFK:	Dutch Market Research Agency
HBAG:	Dutch Agricultural Wholesale Board
IDT:	Industrial Development Trust
In Vitro:	Biological studies using isolated components of an organism
In Vivo:	Work conducted with living organisms in their normal state
IRR:	Internal Rate of Return on investment
KAVB:	Dutch Royal Association for Flower Bulb culture
LBO:	Bulb Research Centre in Lisse
LDF:	Local Development Forum
LEI:	Agricultural Economic Institute – of Wageningen University
NAMC:	National Agricultural Marketing Council
NARO:	National Agricultural Research Organization
NBI:	National Botanical Institute
NCPDA:	Northern Cape Provincial Department of Agriculture
NPV:	Net Present Value
PBR:	Plant Breeder's Rights
PFMA:	Public Finance Management Act
RAI:	Royal Administration International
RDP:	Reconstruction and Development Programme
RoR:	Rate of Return on Investment
SAFGA:	South African Flower Growers Association
SANA:	South African Nurserymen Association
SWOT:	Strength, Weaknesses, Opportunities and Threads
USA:	United States of America
VBN:	The Dutch Flower Auction Association
VOPI:	Vegetable and Ornamental Plant Institute of the ARC

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Executive Summary

Study context

The Lachenalia programme has a rich and complex history of more than 45 years. The research programme was unfortunately often interrupted as a result of funding shortages. After initial hybrids were released, problems with virus infection and a lack of production guidelines resulted in all but one grower withdrawing from commercial Lachenalia production. The existing value chain is complex and consists of only four players. The ARC is contemplating further research and specifically further commercial exploitation of new hybrids. The main question therefore is what the impact of the Lachenalia programme was thus far, and if there is scope for growth. Of particular interest is to determine what the impact on the Nieuwoudtville community was, and if further investment is justified. A combined qualitative and quantitative approach was used; asking the how, why, where, when, what and why questions. Five questionnaires that addressed the different role-players in the value chain were used.

Global floriculture industry

Flowers are grown, marketed and bought in more than 80 countries globally. Annual flower trade has a value of at least US\$40 Billion, with the Netherlands accounting for 54% of all exports. Other exporting countries are Colombia (16%), Ecuador (6%), Kenya (6%), Italy (1.6%) and Israel (1.4%). The main importing countries are the Netherlands and USA and Japan in growing prominence. These three countries account for more than half of the world flower trade. Kenya today commands a 38% share of the EU market and is the largest producer of cut flowers in Africa and the 6th largest in the world. Ethiopia is quickly catching up. The Netherland however remains the leading player in the world floriculture industry. Floriculture products imported into the Netherlands are mostly destined for re-export and the country is the central global marketplace for floriculture. The total export value of flowers and plants distributed via the Netherlands peaked in 2005, at €5 064 billion. Lately, the value of pot plants exports is increasing at twice the rate of cut flowers, with the top three export countries being Germany, the United Kingdom and France, responsible for roughly two thirds of exports. Hence Western Europe should be a key focus area for Lachenalia marketing.

South African floriculture industry

South Africa is exceptionally rich in unique indigenous flowers. A huge number of globally traded hybrids and cultivars originate here, mostly from the Cape Floristic Region, home to an estimated 9600 species. Its relatively mild climate favours flower production. The local flower industry developed around the local auction house, Multiflora and exports were traditionally confined to indigenous products such as the Proteacea. However, since democratisation new export-orientated growers have emerged, but the local market is relatively small. The export value of this industry though, has risen from an estimated R77 million in 1995 to R269m in 2002. South Africa exports cut flowers, plants, foliage and bulbs daily, with bulbs comprising 17%. Most of these products are exported to Europe (65%), the USA (9 %) and Asia (5.2%). Whilst Lachenalia constitutes a negligible fraction, the local floriculture industry has much growth potential and is lagging behind in terms of capacity. The total value of SA's flower bulbs and tubers exports in 2010 was R46 million. South Africa faces increasing competition from its African counterparts especially Kenya and Ethiopia. South Africa's top five export destinations by order of importance are the Netherlands, the USA, Sweden, Finland and Japan.

Lachenalia research history

The ARC breeding programme in the late 60's focused on building a gene bank to maintain genetic diversity of Lachenalia, and on breeding varieties. Basic procedures for maintenance and storage of bulbs, growing conditions, crossings, etc., took place. Various hybrids were selected, propagated and shared with the Bulb Growers Association for evaluation.

From 1988 to 1992 the research focus shifted to virus control and application of tissue culture material. Return on investment became a specific issue as did the need to develop previously disadvantaged communities. Another policy change during this stage entailed the complementing of public funding with external income. It became clear that Lachenalia entailed a complex technology, requiring special skills from a grower. Efforts in commercialisation now had an inherent additional motivation to recover cost. The level of technology transfer support from VOPI at this stage was suboptimal and local growers were struggling to successfully produce bulbs, due to virus infections and complex cultivation practices. After 1992 the R&D team was strengthened, as were relationships with stakeholders in the value chain; including a working group of licensees. Guidelines for production were developed and the royalty income process was streamlined. Evaluation trials were initiated in SA, Holland and the USA. Sadly, R&D efforts were again scaled down by the end of 1996 as funding again decreased and sales disappointed. Commercialization, despite significant investment was characterized by significant failures.

From 1997 the Nieuwoudtville commercialisation effort was initiated. At this stage, a number of potential commercial growers had either abandoned Lachenalia or went bankrupt. A short, very narrow, monopolistic value chain developed with a single provider of disease free tissue material (the ARC); a single propagator (Afriflowers) of viable small bulbils; a single grower/multiplier producing market-size bulbs (the Nieuwoudtville project) and a single buyer, the Dutch Lachenalia trader. No competition was evident and practically all sales took place in Europe. The value chain has cartel elements that constitute a serious issue for ARC consideration.

The past few years has seen a further scaling down of R&D, with increased emphasis on commercialization of existing stock and the limited research focused on production systems, the crossing program and some basic research with universities. Since 2005 no breeding has taken place due to limited funding, but six new cultivars were registered with plant breeding rights in 2009.

The Lachenalia R&D and commercialization programme spans more than 45 years, and has resulted in a high quality product with global marketing potential. Quality cultivars were produced, a gene bank built and is being maintained, production of disease-free tissue material has been achieved; sound cultivation guidelines developed and a vast number of academic achievements recorded. Yet, the considerable public investment in Lachenalia resulted in only a few beneficiaries. Commercialisation efforts were limited due to a combination of factors that included gaps in research funding; virus susceptibility; the long process required to establish viable bulbs and the complex cultivation process. The complex, high cost production system and trade requirements for Lachenalia makes it difficult for new entrants to enter the value-chain. This can however be dealt with through a sound commercialisation strategy that considers the lessons from the past. These lessons derived from the Lachenalia study will also have important lessons for commercialisation of other ARC technologies.

Nieuwoudtville bulb project

The Nieuwoudtville flower bulb project was initiated by the ARC, a fact hardly recognised by current stakeholders. The aim was to commercialise the Lachenalia bulb, address unemployment and stimulate local development at an ideal site for Lachenalia production in a community setting. The NCPDA became the implementing agency, initially with various other stakeholders. Apart from the ARC and NCPDA, all stakeholders have since withdrawn. Initially VOPI supplied training and technical support on a monthly basis. A market for 20 million bulbs was envisaged and the first planting took place in April 1997 on 300 m². Infrastructure was established and beneficiaries from the community contracted as labourers. The second planting of more than 0.5 million bulbs in 1998 was on 2228 m², of which 12 000 were exported. The ownership and management of the project soon became problematic, with stakeholders getting into conflict. A lack of business management skills was

evident. All in all Nieuwoudtville produced between 0.2 and 1 million bulbs p.a. of which most were exported to Holland, by John van der Vossen, the Dutch grower.

Whilst the aim was to initiate empowerment and perhaps established other projects, this has not happened yet and there is currently no exit strategy contemplated. None of the initial beneficiaries are still involved. However, a number of the initial beneficiaries have been empowered and today hold employment elsewhere in the area. The current team leader has been with the project since 2000 when she started as a seasonal worker. Earnings vary from R95 per day for the supervisor; R70 for the three permanent staff and R60 per day for the 15 seasonal workers. More than 80% live in RDP houses and only 4 out of 20 interviewed used earnings for anything other than food. None of the beneficiaries have any understanding of the financial aspects of the project and they are effectively casual labourers from January to mid-July – and again from October to December. Soil bed preparation takes place from January, bulbils are planted in March, bulbs flower from end June to September and harvesting occurs in October, after the growth has died off. Bulbs are dried, cleaned and classed by hand; labour intensive, delicate work. Roughly two thirds of the bulbs are marketable, with the rest being smaller bulbs of which some are replanted and others are sold locally. In 2010 a total of 480 000 bulbs were planted, significantly more than in 2009. All input is purchased by the Extension officer, who visits the project twice a week, from his office at Calvinia, ± 70 km from the site. John v/d Vossen visits the project three times a year. Beneficiaries expressed satisfaction with the project, although some indicated that they would have liked to be more informed.

The Nieuwoudtville Lachenalia project is self-sustaining and appears marginally profitable, according to the available data, despite limited sales. In excess of 3 million bulbs can be produced on site per year. Disturbing was that Mr Steenkamp, as the only decision making authority at Nieuwoudtville, told the investigation team that he would not answer all questions. The Department duly also did not provide sufficient project data. The fact that an official, publicly funded project was not open to scrutiny and evaluation is worrying. A letter by the CEO of the ARC to the HOD of the Department, after various other options of communicating with the Department failed, was also ignored. Negotiations with the one major buyer is a farce, as Mr van der Vossen is in full control of the value chain; from his initial request to the propagator for the amount of bulbils to prepare for the year, to the decision on how many bulbs to export to the Netherlands. He also is the only authority on the price to be paid, the limited local sales and the eventual royalties paid, on what he declares as successful sales. An issue of contention is virus infection – which according to the ARC and propagators is not an issue, but which Van der Vossen uses as basis for payment.

Empowerment was evident; the salaries earned contribute to a number of livelihoods. The project employs between 20 and 40 people, depending on the time of year. The workers have a relatively low skill-base and most are functionally illiterate. Skills transfer and general agricultural awareness did take place, contributing today to the human capacity evident at other projects, such as the Rooibos processing unit at Nieuwoudtville. The extensive support rendered by the NCPDA entails a commitment to technical and administrative support. Whilst it does constitute a contribution to the community, it is not sustainable as empowerment is highly limited. VOPI's role is also not optimal and the organisation is not recognised as a provider of services by the beneficiaries.

Bulb buyer: Van der Vossen

Mr Van der Vossen, who owns a nursery in Holland and produces a variety of pot plants, was approached by the ARC on the recommendation of a Dutch Flower Association during the 1980s. He began working with a local flower grower and has over the years been involved in various companies that commercially exploited Lachenalia. He still buys bulbs in October and grows them during the Dutch winter at his nursery, to be sold in the European Spring all over Western Europe. He maintains that Lachenalia is of limited importance in his business and when interviewed could not provide the extent of Lachenalia in the turnover. Yet, in a flower publication he stated that Lachenalia and tulips

are the mainstay of his business. He developed an even growth manipulation process which ensures that bulbs grow evenly. Other stakeholders indicate he probably uses inhibitors, temperature and light manipulation, a process used throughout the industry. Van der Vossen visits Nieuwoudtville three times per year and an oral agreement that all clean bulbs will be bought is reached each year with the Departmental extensionist. Payment is in tranches, based on the bulbs actually sold in Europe, which vary depending on losses due to virus infection that Van der Vossen declares. Apart from bulbs he exports, he also buys the smaller bulbs from Nieuwoudtville and sells these to Hadeco, after which he pays the proceeds into the project's bank account. Van der Vossen meets the ARC occasionally, and he believes its researchers are naïve about Lachenalia potential. He does agree that marketing is critical.

Van der Vossen manages the total value chain; he effectively determines the global market supply of Lachenalia. He presented Lachenalia successfully at many occasions, won many prizes and appeared in many publications. Lachenalia is for all purposes only potted in the Netherlands and sold throughout Europe through an extended Dutch distribution network. Despite various trials in US resulting from the publications mentioned, no production is currently taking place in the USA. Van der Vossen when interviewed repeatedly mentioned that viruses have a huge impact on Lachenalia marketability, inhibiting Lachenalia reaching its significant potential. Currently Lachenalia's cost price is too high due to viruses and uneven flowering, which requires control and screening, in a sterile working environment; all increasing costs. He pays royalties on the bulbs sold to the consumer, according to his calculations. These have never been questioned.

Over the past fifteen years, the ARC has spent ± R3 million in developing cultivars, which has up until now empowered one grower from the Netherlands, one local propagator who is an ex-ARC employee, and has resulted in casual labour opportunities for roughly 40 beneficiaries. The one grower has apparently stated that he would withdraw from the project should bulbs be sold to other buyers. The business model is monopolistic, anti-competitive, restrictive and exclusive; effectively barring new entrants. This poses a severe risk to the ARC, as a public entity mandated to support growth and expansion of the sector. Remedial steps are urgently required to salvage the situation and avoid legal ramifications of the Competition Act of 1998).

Lachenalia market study

A main finding of the study done in collaboration with the Wageningen University's consumer studies department was that Lachenalia, compared to other pot plants, is a relative expensive product. However, the market for flowering pot plants and the amount spent on such pots has been increasing steadily. This constitutes an important niche for Lachenalia, which has won prizes on international flower fairs and in magazines and is perceived as a quality pot plant. Hence limited exposure of Lachenalia in Europe is not due to a lack of unique attributes, but of limited promotion. The study found that there was particular potential for Lachenalia to be marketed as a quality, high value product, sold in upmarket outlets in Western Europe. It is advisable that Lachenalia is sold particularly as a product from SA, grown by communities in the Namaqualand, as part of local development: Selling the bulbs in African branded pots, providing a leaflet or label (i.e. with a link to a website) that describes the history of Lachenalia and its contribution to job creation, would make it highly attractive in the European market, as it is unique, has good colour variety and a long pot life.

SWOT analysis

Lachenalia is a quality, long-life pot plant with unique characteristics and global marketing potential. Local and global flower bulb networks and linkages could be mobilised to market Lachenalia; exploiting its 45 year research history which resulted in a huge gene bank and an effective production system for disease-free tissue material. Sound cultivation guidelines have been established and many lessons have been learnt from the Nieuwoudtville community project.

Despite huge investment, commercialisation has been limited; bankruptcies and poor uptake resulted from the fact that Lachenalia is a relative expensive, complex product that requires particular cultivation skills. The current value chain presents a severe risk to the ARC, as a public entity mandated to support growth and expansion of the sector. Other threats include that the process for synchronised development in Northern Hemisphere is not known here and if the value chain is to be expanded and more growers in Europe are to be engaged, this process should be described and documented. It is critical to expand the value chain. What appears to be maladministration by the NCPDA at Nieuwoudtville in terms of procurement and pricing mechanisms, the lack of empowerment and the exclusive trading with the Dutch buyer, is questionable in terms of the competition act. Current beneficiaries are reduced to short term, casual labourers. The fact that the current buyer provided contradicting, evasive information and threatens to withdraw should bulbs be sold to others is problematic.

The local floriculture industry has significant growth potential and is currently lagging behind capacity, and facing increasing competition from African counterparts. There is a market for Lachenalia bulbs in Western Europe, where the demand for pot plants and the amount spent on such pots is increasing. Lachenalia can attract entrepreneurs from disadvantaged communities and can provide opportunities and employment in a poor area with limited job opportunities. Specifically the gift market had an estimated growth potential of 35% in Europe alone (before the euro crisis). It will be imperative to add value by making Lachenalia a unique African, quality product. The ARC should investigate partnerships with public entities such as the DTI and NAMC to intensify commercialisation

Economic analysis

The economic impact of the investment in Lachenalia, both in terms of research and commercialization was difficult, due to a lack of data from the ARC, NCPDA, propagator and Dutch buyer. Accurate historical data was simply not available and assumptions were required to make any past and future projections regarding rate of return to investment estimates. The indications from the limited data are that there will be potential return on further investment. It would appear that the ARC's income covered at least 30% of the research investment in all but three years, and that covering all costs through income from mother material and royalties is not inconceivable in future, provided that the value chain is expanded and royalty income is managed locally. The Nieuwoudtville Project struggled in certain years to show a positive cash flow, but has been able to earn income to cover costs in most years, despite low bulb sales. Given a more empowering commercialisation mode, more profitable projects can be initiated. It must be noted that the calculations have been made from incomplete data received and certain assumptions, which could not be verified. This might render results achieved incorrect and ideally should be verified.

Conclusions & recommendations

The value of pot plants exports in the global market is increased at twice the rate of that of cut flowers, especially in Western Europe and there is extensive scope for growth in the South African floriculture industry, also for Lachenalia. The Lachenalia programme has resulted in a high quality product with global marketing potential. Still, the considerable public investment in Lachenalia resulted in only a few beneficiaries thus far and at this stage the impact is minimal. The current value chain is manipulated by one buyer, is monopolistic, anti-competitive, restrictive and exclusive; effectively barring new entrants. This poses a severe risk to the ARC, as a public entity mandated to support growth and expansion of the sector.

A market for Lachenalia bulbs exists in Western Europe, where the demand for pot plants and the amount spent on such pots is increasing. Lachenalia can provide employment in areas with limited job opportunities. Lachenalia could reach its significant potential resulting from its long pot-life, many flowers with a variety of colours, if properly promoted. Growers interrogated agreed that if value is added to the pot, its value would be increased. Its competitive advantage has not been fully

exploited thus far. The limited exposure of Lachenalia in Europe is not due to a lack of unique attributes, but a result of limited promotion. This is crucial and has to be addressed in commercialisation efforts. The ARC should investigate partnerships with public entities such as the DTI and NAMC to intensify commercialisation.

What appears to be maladministration by the NCPDA at Nieuwoudtville in terms of procurement and pricing mechanisms, the lack of empowerment and the exclusive trading with the Dutch buyer, is questionable in terms of the competition act. The fact that the current buyer provided contradicting, evasive information and threatens to withdraw should bulbs be sold to others is problematic.

A proposed business model entails that ARC-VOPI keeps its primary function of supplying disease-free tissue culture material. It is suggested that another multiplier is established, complementing the current propagator Afriflowers, to produce bulbils; and that initially, one additional grower is established to compliment output from the Nieuwoudtville community. Targets bulb sales could rise significantly using such an approach of commercialisation, marketing and technology transfer. A dedicated training programme should be developed for producers; empowering groups in technical and business skills. The preference would be to identify other communities within the North-Western Cape area, to align with the strategic direction of the ARC in empowering new entrants into the sector. It is highly advisable that Lachenalia is sold as a South African product, grown by communities in the Namaqualand, as part of local development.

CHAPTER 1: BACKGROUND AND INTRODUCTION

1.1 PROBLEM STATEMENT

In 1965 The Vegetable and Ornamental Plant Institute (VOPI) of the ARC began research on Lachenalia; a unique indigenous winter-growing bulb endemic to an area in the North-Western Cape region. The aim was to produce hybrids for commercialization. Over a period of more than 40 years, various hybrids were developed and a series of commercialisation efforts were launched, with mixed results, despite the obvious potential of the product. Initially, VOPI involved private commercial propagators and whilst some success was recorded, problems were encountered relating to virus infection, the long cycle required to deliver viable bulbs, inexperience in marketing, the complexities of registering plant breeder's rights and limited adoption of the Lachenalia technology.

During the 1980s the ARC decreased its Lachenalia research, due to limited funding and the assumption that bulb growers would develop suitable cultivation practices. Only a few producers adopted Lachenalia and all reported virus infections. VOPI at that stage only supplied propagation material and virus control recommendations did not exist. In Holland, problematic bulb storage techniques and flowering manipulation were investigated. All Lachenalia producers went bankrupt or abandoned Lachenalia production in the Nineties: Hadeco stopped producing Lachenalia as it did not fit in with its other production systems. It still buys a limited number of bulbs produced at Nieuwoudtville, through the single Dutch buyer. Businesses that at some stage sold Lachenalia but went bankrupt include SAFROPA, Schipper, Langberg and Vosbol/Labolia. Problems were also experienced in obtaining agreements for royalties. The owners of Vosbol/Labolia are still involved in production and sales of Lachenalia through new businesses.

Attracting entrepreneurs and producers from disadvantaged communities, to a Lachenalia enterprise is challenging; a general problem in rural development. Christoplos (2008) stated that "with a market-orientation perspective, technology transfer is secondary to the social and institutional innovations required to bring actors together, get products to market, ensure competitiveness and establish linkages". Yet, during the late Nineties, a Lachenalia bulb production project was launched in Nieuwoudtville, aiming to empower the previously disadvantaged.

The main market for Lachenalia is Europe, and the existing value chain is complex and specialised with a limited number of players and linkages. The chain currently involves five role players; the ARC; developer of mother material; Afriflowers, propagating planting material; the Nieuwoudtville community; the Northern Cape Provincial Department of Agriculture (NCPDA), managing the project and the main buyer from the Netherlands, Mr Van der Vossen. The Nieuwoudtville project is currently the only sizable commercial entity producing Lachenalia bulbs in South Africa.

VOPI is contemplating further investment in breeding and commercialisation of Lachenalia lines. However, it is not sure if the project has generated sufficient value for the ARC, the Nieuwoudtville community and society at large. Although the involvement of the Nieuwoudtville community seems to ensure a consistent, reliable supply of Lachenalia bulbs, empowerment of the beneficiaries and the extent of participation in the value chain are questionable. Hence, VOPI approach the Economic Services to request a thorough Impact Assessment.

1.2 OBJECTIVES OF THE STUDY

The first objective was to determine the impact of the *Lachenalia* programme since inception until now (*ex post* impact assessment) with particular emphasis on the Nieuwoudtville community project. The second objective was to determine the programme's viability in terms of continued ARC research and commercialisation - is further investment justified; and would the rate of return to public (ARC) investment be positive. Specifically issues investigated were:

- Value chain levels and value created at each level,
- Commercialization potential locally and internationally,
- Rate of Return of past and future public investment,
- Alternative commercialisation options in partner involvement and expansion,
- Promotion and marketing.

(See Annexures for the Terms of Reference (ToR) of the study)

1.3 METHODOLOGY

The study was based on an in-depth investigation of the value chain, using a combined qualitative and quantitative approach. The strategy was to ask the how, why, where, when, what and why questions. Five questionnaires that addressed issues of the different role-players in the value chain were developed. All role-players were engaged to gain insight into their activities in the value chain and the nature of the relationship between actors. Telephonic interviews were used where required (see abridged questionnaires annexed).

An investigation of the initial breeding and commercial programme took place, including the propagation and multiplication of disease-free tissue material: Interviews were conducted with ARC researchers and the commercial propagator, Ms Fransie Hancke of Afriflowers, to establish the process of obtaining viable bulbils.

Interviews with stakeholders at the Nieuwoudtville community project and collection of data from the extension officer from the NCPDA responsible for administration and management of the project, as well the provincial offices in Kimberley took place. Limited financial records were obtained.

Sales and marketing at local and international level was also dealt with, as was the administration and payments of royalties. A literature review assisted in providing information on the global floriculture industry and the scope for commercialization. A 1997 impact assessment report (Niederwieser, et. al., 1997), provided baseline information as a benchmark for milestones achieved since 1997. A market study was done with the Wageningen University in the Netherlands, through a post graduate study on the market potential of *Lachenalia* internationally. Various telephonic and personal interviews were held in the Netherlands with a variety of role-players and interested experts. Recognised floriculture organisations were engaged, including Preijde Bulbs company; KAVB: Royal Association for Flower bulb culture; VBN: Dutch Flower Auctions Association; Eurostat: European Bureau for Statistics; HBAG: Dutch Agricultural Wholesale Board; Productschap Tuinbouw;

CBS: Dutch Central Bureau for Statistics and DLV: Agricultural Information Office in Holland. The International Hortifair 2010 in Aalsmeer was visited and a follow up interviews held with Gerrit Preijde and John van der Vossen dealing with questions on production, marketing, export, import and financial data. Two florists and a garden centre in Wageningen were visited to verify information obtained in interviews. Questions were asked about consumer behaviour, distributions channels and competition in the market. To get insight in royalty income a telephonic interview with Nellie Hoek of Royalty Administration International (RAI) was held.

After presentation of a draft report a follow-up investigation into the scope for commercialisation was done, in which the NAMC was asked to play a key role. Afriflowers was again consulted whilst Mr Stuart Barnhoorn of Hadecco was also engaged.

The report consists of seven chapters. Chapter 1 deals with the background and introduction. Chapter 2 provides an overview of the evolution of Lachenalia research and commercialisation. Chapter 3 describes global and local floriculture industry and deals with an in depth market study. Chapter 4 describes the Nieuwoudtville project; Chapter 5 provides the SWOT analysis for the Lachenalia value chain whilst Chapter 6 provides the economic analysis of the value chain. Chapter 7 summarises findings and provides conclusions and recommendations.

CHAPTER 2: LACHENALIA PROGRAMME EVOLUTION

2.1. INTRODUCTION

Lachenalia is an annual winter-growing bulb that occurs naturally in a part of the winter rainfall area of South Africa. The genus consists of 110 species. The Lachenalia research program at ARC-VOPI started in 1965 and has gone through several phases. In 1983, 17 hybrids were registered for Plant Breeders Rights. Trials were conducted in Holland and the USA (California, Beltsville, Maryland). From 1988 to 1992 the ARC initiated a plant improvement scheme focused on virus control and application of tissue culture material. Scientific outputs include 3 PhD, 7 MSc studies and more than 45 scientific publications. In 2009 six new cultivars, with more competitive traits were released. No sales contracts have yet been secured.

Despite huge investment, commercialisation success of the Lachenalia R&D programme has been limited. As the R&D environment becomes more competitive, the need not only to indicate a return on investment, but also to ensure technology uptake becomes critical. Core funding of the ARC declined in the 1990s, and in 2001 it reached 55% of what it was in 1990 (Flaherty, *et. al.*, 2010). A priority of the ARC is to contribute to the development of previously disadvantaged communities. In line with government policy, the ARC strives to demonstrate the value and impact of public investments in research; and collect external revenue through commercialization of research results.

In conducting an impact assessment on the Lachenalia programme, both in terms of R&D and commercialisation, the history of the past 45 years can be divided into five phases:

- Phase i: The initial breeding program (1965-1972)
- Phase ii: Development of improved hybrids (1973-1982)
- Phase iii: Exploring commercial potential (1983-1992)
- Phase iv: Revitalization of the research program (1993-1996)
- Phase v: Commercialization through a community-based project (1997-2010)

Information presented in this chapter is based on a literature review, which includes a previous impact assessment (Niederwieser, *et. al.*, 1997), as well as interviews conducted with the objective to document the history of the programme and define the Lachenalia value-chain.

2.2 THE INITIAL BREEDING PROGRAM (1965-1972)

Initially, research focused on building a gene bank to maintain the genetic diversity of Lachenalia, after which it moved towards breeding varieties for commercialization. According to Niederwieser *et al* (1997), the gene bank initially had 17 accessions, which was increased to 59 by the end of phase I. Basic procedures for maintenance and storage of bulbs, growing conditions, crossings, pollen storage, germination, seeding growth, and propagation were established. An initial evaluation of hybrids, and characterization of species accessions, was carried out and a total of 177 species-species crosses were made during this period. Consequently it was decided that certain hybrids could have

commercial potential and roughly 20 were selected and propagated in the late 1960s, and handed to the South African Bulb Growers Association for evaluation in 1972. Of these selections, three were chosen by the Growers, for commercial propagation. Using the Association to evaluate hybrids was a strategy premised on stimulating market activity where farmers would then be in the forefront of marketing and selling *Lachenalia*. Another 39 hybrids were identified for evaluation in 1972. Whilst publicly funded, the aim of agricultural R&D, as it is today, was to grow the sector and increase income of farmers and other role-players. Collaboration between VOPI and the Bulb Growers Association was a step in the right direction, but the poor uptake of the technology was puzzling.

2.3: DEVELOPMENT OF IMPROVED HYBRIDS 1973-1982

In this phase, R&D efforts were focused on making *Lachenalia* more commercially attractive. Niederwieser *et al* (1997) indicated that the emphasis was on producing as many hybrids as possible to select those suitable for pot-plant production. Roughly 645 crosses were made during this phase. Criteria such as the growing period, flowering time, uniformity and appearance of the inflorescence were used for evaluation and characterization of accessions. Propagation by growers led to the identification of severe susceptibility to virus infection. Subsequently, meristem culture for virus elimination and tissue propagation of virus-free propagation material was initiated. Preliminary trials on propagation by leaf cuttings were carried out. Hybrids produced during Phase II were superior to those of the previous phase, and 47 were selected for evaluation. After evaluation by bulb growers, applications for five hybrids were made to obtain plant breeders' rights (PBR) in 1980.

Despite the involvement of the Bulb Growers Association, *Lachenalia* as a new technology faced competition from other bulbs in the market. Commercialization efforts would probably have been more successful if more funds were dedicated to marketing. A general concern with commercialization of research results is a failure by R&D institutions to commission market research and align the research to consumer preferences (Anandajayasekeram, P. and Puskur, R. 2010), but given the involvement of the Bulb Growers association, this concern was not fully valid for *Lachenalia*. Still, the programme was inherently a supply-led technology, which often is not backed by comprehensive market intelligence. To some extent criticism can be levelled towards the initially limited effort in terms of marketing and commercialization. Whilst R&D work started in 1965, commercialisation efforts only started in the 1980s.

2.4: EXPLORING COMMERCIAL POTENTIAL (1983-1992)

Phase III was marked by intensified marketing efforts. VOPI supported growers by addressing the virus infections that became common. Growers were also more actively engaged in trials, to stimulate interest in commercialization. Collaboration with international agencies with a view of broadening the *Lachenalia* market outside South Africa was also initiated and Plant Breeders' Rights were registered to obtain income from royalties. The ARC relied heavily on the South African Flower Growers Association to commercialize *Lachenalia*, resulting in the appointment of Multiflora Pty, (Ltd) as the sole licensee for all of ARC-VOPIs' *Lachenalia*. The responsibilities of Multiflora were limited to sub-licensing to South African growers, and eventual management of a research fund

(licence fees and collected royalties). At the recommendations of the growers, Fides BV (Holland), a strong chrysanthemum breeders company with experience in administration of plant breeders' rights, was appointed as exclusive international agent for Lachenalia in 1988 (Niederwieser, *et. al.*, 1997). Some quotes from the 1997 impact study include:

“Positive developments during this phase were the initiation of a plant improvement scheme to control virus infection, as well as the development and application of tissue culture to propagate selections to obtain enough bulbs for evaluation by bulb growers. Applications for plant breeders rights (PBR) were made in 1983 for an additional 17 hybrids, and at the same time, these hybrids were tested by South African growers.”

“Fides realized the necessity for developing techniques for pot-plant production and subsequently signed a trial agreement in 1988 with the USDA’s Floral and Nursery Crops Research Unit in Beltsville, Maryland who were willing to carry out research on Lachenalia”.

It became clear that the Lachenalia technology was complex, requiring special skills from a grower to deliver quality plants. Furthermore, contractual relationships among the actors in the value chain are required, as is quality control, continued R&D and technical support as well as monitoring and evaluation. Licencing is a necessary tool for quality control although it restricts participation. Given the complexity of the value chain, administration of royalties are difficult to manage, especially if calculations for royalty income are based on sales in the overseas markets.

The relationship between VOPI, the Grower’s Association and Fides later collapsed due to limited progress in commercialization; continued problems with viruses and a lack of uniformity in flowering. Also contributing was a lack of guidelines for cultivation and handling of Lachenalia; a lack of expertise and experience among growers locally and in the Netherlands and effectively a poor level of technology transfer, with VOPI only supplying propagation material at this stage. Since virus control guidelines did not exist, plants grown at Hadeco and Schipper became heavily infested. VOPI was not able to make recommendations regarding large-scale cultivation as no agronomic studies were carried out at the time. Local growers, except for Hadeco and Schipper, did not have the resources to conduct in-house cultivation trials. Lachenalia production did not fit Hadeco’s massive propagation system, unsuited for a specialist product. Whilst eight growers received bulbs for trials during this phase, only three growers had Lachenalia bulbs (Hadeco, Safropa and Schipper) at the end of this phase. The relationship between VOPI and Fides was terminated and a new contract established with Royal Administration International (RAI) with a benefit sharing structure for royalty income set at (25/75) in favour of the ARC. VOPI decided to actively explore commercialization and support commercial production with continuous supply of virus-free propagation material. Defining consumer preferences remained challenging.

2.5: REVITALIZATION OF THE RESEARCH PROGRAM (1993-1996)

The aim to grow the agricultural sector and increase income of farmers and other role-players within the economy remained valid with the establishment of the ARC, but was broadened to include a new client; previously disadvantaged black farmers. Another policy change was that the ARC aimed to

complement public funding with external income. Efforts in commercialisation now had an inherent additional motivation to recover cost through administration and collection of royalty income. Hence, intensified R&D efforts and commercialization activities took place. The R&D team at VOPI was strengthened, as were relationships with stakeholders in the value chain. Two plant breeders, two horticulturists, a botanist, a bio-technologist (for tissue culture) and supporting staff were appointed for the Lachenalia project. Interaction with the licensees was established through a working group consisting of researchers, propagators and pot-plant growers. Priorities were on flower manipulation studies, optimal temperature for pot-plant cultivation, elimination of viruses, a hybrid evaluation system, production of propagation material, and trials on vegetative propagation. Guidelines for production were finally developed.

Interaction with South African and Dutch growers became consistent. Processes relating to administration and collection of royalty income were streamlined. This included registering of Plant Breeders Rights in Holland to protect ten varieties and evaluation trials carried out in SA, Holland, and in California, Beltsville, and Maryland in the USA.

Unfortunately, R&D efforts were again scaled down towards the end of 1996 due to funding limitations and disappointing Lachenalia sales. R&D input was limited to a few critical areas, such as the gene bank maintenance, and evaluation of the remaining hybrids. Commercialisation, despite significant investment remained limited. This curtailing of research funding again resulted in a loss of momentum.

If the programme is to continue, it is critical that resources, especially in terms of HR capacity, are available. An appreciation of the costs of driving commercialisation is also needed. Obtaining funding from the private sector, specifically from the flower industry locally and abroad, could also be explored. Colombia exports the majority of its flowers to the United States with significant private investment from the latter. Hence the Colombians continuously innovate and supply floriculture products responsive to their customers (White, 2007).

The budget allocated to Lachenalia commercialization during this phase was insufficient. When Schipper Flowers was liquidated in 1994, the bulbs in the estate were obtained by Langberg Nursery in 1996 after drawn out negotiations. Eventually it was agreed between Langberg and VOPI that Langberg would, as chief licensee, be responsible for the protection of ARC PBR at Langberg's cost. Langberg went bankrupt in the late 1990s.

Commercialisation of Lachenalia has been characterized by significant failures. All growers that at some stage grew Lachenalia stopped Lachenalia at some stage. Hadeco and SAFROPA in 1993; Schipper went bankrupt in 1994 and Langberg went bankrupt in the late 1990s. Vosbol/Labolia, a previous effort from Afriflowers and Van der Vossen, went bankrupt in 2006.

In 2010 only one trader, Mr Van Der Vossen commercially exploits Lachenalia. A legitimate question would be why none of the other initiatives mentioned bore any fruit and what the ARC should do to effectively commercialise Lachenalia.

2.6 COMMERCIALIZATION (1997-2010)

VOPI significantly scaled down R&D in *Lachenalia* from 1997 onwards, emphasising commercialization. Remaining research focused on a production system, a limited crossing program and basic research in cooperation with universities. Additional commercial growers were established and the first bulbs were sold commercially: In 1999, a company called Labolia (owned by Francis Hancke and Eliza Louw, erstwhile ARC employees) produced marketable size *Lachenalia* bulbs, VOPI provided this company with disease free tissue. Bulbils from Labolia were sold to Vosbol International, also owned by Francis Hancke, Eliza Louw and John Van Der Vossen. Vosbol went bankrupt in 2006, partly due to a failure of the market to absorb the amount of *Lachenalia* products created and the emergence of a new set of viruses on *Lachenalia*.

Between 2006 and 2009, Afribulb replaced Labolia as commercial propagator, which was again replaced by Afriflowers, who bought roughly 1000 units of stock material annually from the ARC since 2010. Since 2005 no breeding has taken place at the ARC, due to limited funding, apart from a mutation breeding project which included *Lachenalia*. Hybrids were evaluated and 6 new cultivars were registered. Sales decreased due to challenges around marketing. Other achievements include academic advancements through 20 publications and 5 MSc's. Co-operation was established with other higher education institutions and agencies at local (UFS, UP) and global level (agencies in Italy and Poland). The Department of Science and Technology funded the mutation breeding.

A short, very narrow, value chain of a monopolistic nature developed involving a community based project, established in 1997 in Nieuwoudtville in the Northern Cape. This value chain comprised a single provider of disease free tissue material (ARC); a single propagator (Afriflowers) of viable small bulbs (through multiplication of bulbils from mother material); a single grower/multiplier producing market-size bulbs (the Nieuwoudtville project) and a single buyer, the Dutch *Lachenalia* trader. Apart from a few minor *ad hoc* sales from Nieuwoudtville, this buyer effectively became the only *Lachenalia* marketer. Although initiatives to include other role-players took place, there is no competition evident and the considerable advantage of significant public investment in terms of R&D and technical support and advice is available only to the few actors in the short value chain.

2.7 CONCLUSION

The history of the *Lachenalia* R&D and commercialization programme spans more than 45 years from its initial identification and selection from its natural habitat in the North-western Cape to a high quality product with global marketing potential. VOPI has discharged its R&D responsibilities in line with its mandate as defined in the Agricultural Research Act (No. 86 of 1990). Sound R&D results were achieved under difficult funding conditions. A number of cultivars were produced, a *Lachenalia* gene bank was built and is being maintained, production of disease-free tissue material has been achieved; sound cultivation guidelines have been developed and a number of academic achievements were recorded, whilst technical support was rendered to various actors. Less positive aspects include the lack of consistent R&D funding leading to shortages of skilled researchers and consequently many interruptions in research. The lack of empowerment of growers, and hence commercialisation, despite significant investment, is troubling.

Limited commercialisation success resulted from a combination of factors, including limited resources and commercialisation skills. The Lachenalia bulb's susceptibility to viruses and the long process of researching and developing cultivation practices also played a role. The narrow value chain must be addressed. Given the complex, drawn out process of Lachenalia cultivation, the problems with commercialisation should not be unexpected. The lack of production guidelines, solutions for recurrent virus infestations and poor marketing, limited impact. The assumption that private growers would deal with the complex Lachenalia production system was mistaken and the ARC did not have the resources and technology transfer skills to support growers. This led to market distortion: the narrow value chain with monopolistic, cartel aspects, an example of market failure that contributed to the low uptake of the Lachenalia technology.

Actors in the Lachenalia value chain require specific skills and access to expert support. Lachenalia producers should probably be licensed and their production activities certified to ensure quality control. Practically, the complex, high cost production system and trade requirements for Lachenalia makes it difficult for new entrants to enter the value-chain. Between 1970 and 1997 various companies have fallen bankrupt or stopped producing Lachenalia.

Limited collaboration with public and private institutions in South Africa and internationally, also impacted on business and social development. Lessons can be derived from the Protea industry, known by working relations between all actors in the value chain, its local and international networks and sound logistical management (Knoesen & Conradie, undated; Matthee, et al., 2005). In Colombia, consumers of floricultural products are important stakeholders in the industry, to the extent that they provide funding for infrastructure development (White 2007). The complex nature of the Lachenalia technology must be appreciated in efforts to build a viable market. Commercialization of Lachenalia should not only be confined to elements of IP management and collection of royalties but should consider the entire value chain and should stimulate enterprise development. The lessons derived from this Lachenalia study will also have important lessons for commercialisation of other ARC technologies with similar characteristics.

CHAPTER 3: GLOBAL & LOCAL FLORICULTURE INDUSTRY

3.1 INTRODUCTION

This chapter provides an overview of the floriculture industry, both globally and in South Africa, exploring the potential market share of *Lachenalia* within the established flower market value chain.

3.2 GLOBAL FLORICULTURE INDUSTRY

Floriculture as an industry began in the late 1800s in England, where flowers were grown on a large scale on estates. The industry continued to advance into a profitable agri-business throughout the world. The present day industry is dynamic and fast growing. In the 1950s, the global flower trade was less than US\$3 Billion. Flowers are grown, marketed and bought in more than 80 countries globally. Annual flower trade has a value of at least US\$40 Billion, with the Netherlands accounting for 54% of exports (Getu, 2009). Other exporting countries are Colombia (16%), Ecuador (6%), Kenya (6%), Italy (1.6%) and Israel (1.4%). Importing countries are mainly European and the USA, although Japan is increasing in prominence. Major individual importers are Germany (18%), UK (17%), USA (16%), France (9%), Netherlands (9%), Italy (4%), Japan (4%) and Switzerland (3%). The Netherlands, Japan, and the USA account for the major share of the world flower trade (Kargbo *et. al.*, 2010).

The flower farming and export industry is experiencing growth, especially in Africa. With several African countries struggling with poverty, policy makers and entrepreneurs are seeking opportunities in this industry. A number of countries are becoming major exporters to Europe and Kenya commands a 38% share of the EU market. Others include Zimbabwe, Uganda (36%), South Africa (2%), Zambia (2%), Ethiopia (1%) and Tanzania (1%). Especially the growth potential of Ethiopia's flower sector is seen as remarkable (Pricewaterhousecoopers & GRET, 2006).

Kenya is the largest producer of cut flowers in Africa and the 6th largest in the world: Flowers accounted for 52% of the shillings value of export in 2009 but exports fell due to drought and the recession in Europe. The Netherlands has increased its export of planting materials by 17.2% and 36.6%, to Kenya and China respectively and provides a market outlet for the Chinese and Kenyan flower products. China has emerged as a large producer and exporter of floriculture products in Asia. China's value of production in 2009 was US \$1.17 million (Kargbo, *et. al.*, 2010).

The Netherlands has the largest market share and remains the leading player in the world floriculture industry. The country has a population of ±16.4 million, of which a growing percentage (roughly 35% in 2007), are single person households that buy less flowers and plants. However an aging population do tend to buy more flowers and in 2030, it is expected that 25% of the Dutch population will be 65 years or older. Research also showed that 75% of all Dutch organizations acquire flowers or pot plants on a regular basis. Particularly organizations in the service sector, for example hotels and restaurants, spend significantly on flowers and pot plants. In companies of more than 50 employees, flowers and pot plants are more common than in small companies (Productschap Tuinbouw, 2007).

The production share of floriculture stands at 27% in the agriculture sector of the Netherlands. The number of ornamental plants cultivated under glass, production of flower bulbs and propagation material decreased considerably between 2003 and 2008. The Dutch consumer market for flowers and pot plants has decreased for several years reaching a low point in 2003. After 2003 the market has recovered. Floriculture products imported into the Netherlands are mostly destined for re-export. The Netherlands is a central marketplace for floriculture, because of its flower auctions. Figure 1 shows that an increasing number of products are imported. Cut flowers are easier to sell via the Netherlands than pot plants, because of lower transportation costs. Pot plants constitute 28% and cut flowers 62% of floriculture export from the Netherlands.

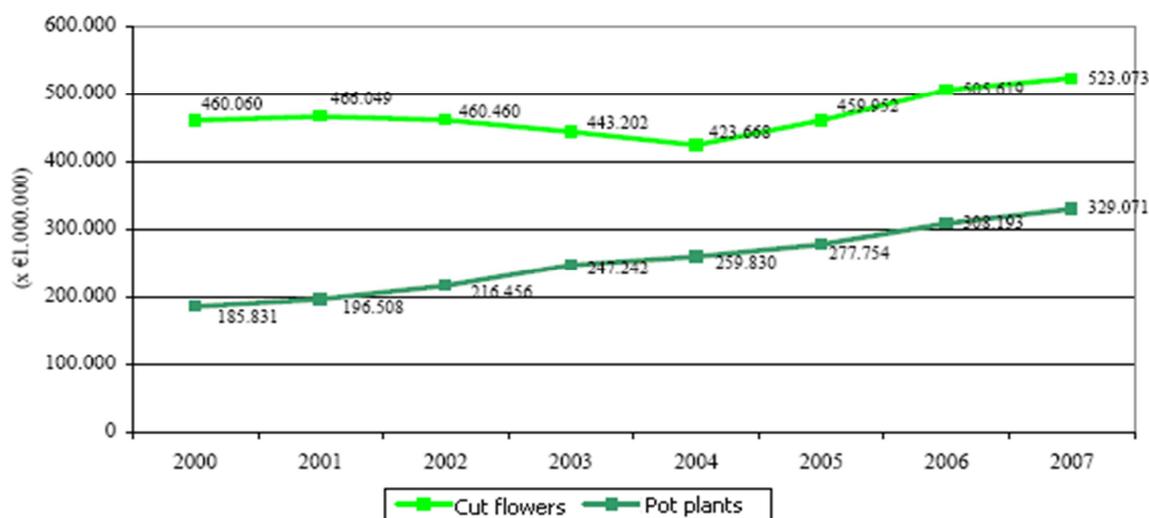


Figure 3.1: Import of flower products to Netherlands (Productschap Tuinbouw, 2007)

Table 3.1: Important export countries for Dutch exporters in 2007 (HBAG, 2008)

Cut flowers		Pot plants	
Germany	26.1%	Germany	34.1%
United Kingdom	21.7%	France	11.8%
France	13.6%	United Kingdom	9.5%
Italy	5.4%	Italy	8.3%
Belgium	3.2%	Belgium	5.2%
Other	30.0%	Other	31.1%

Export markets trends from the Netherlands are important within the global floriculture market: Germany, France and the United Kingdom are the biggest export markets for cut flowers, pot plants and flower bulbs, whilst Poland and Russia are the fastest growing export markets. The total export value of flowers and plants distributed via the Netherlands peaked in 2005, at €5 064 billion. The value of pot plants between 2000-2005 increased with 6.5%; twice the rate of cut flower exports, reaching a value of €1 715 billion in 2005. The top three export countries, Germany, the United Kingdom and France, were responsible for 59% of the Dutch export. In global floriculture production and trade, the Netherlands functions as a central marketplace because of its flower auctions and worldwide network. The Netherlands is also the biggest pot plant producer, followed by Germany, who however produces mostly for the local market.

In Japan, the role of the Netherlands as import source has been decreasing for years, due to other producing countries in the region. In Germany, France and the UK, flowers and pot plants are

distributed mostly via florists, garden centres and supermarkets, while in Poland and Russia the florist and the open air market have a leading role. Given that spending on flowers in Germany, France and the UK is comparable with that in Holland, Lachenalia has the most potential in these countries. Again, as in Holland, these markets are saturated, but given a continuous demand for novelties and less-known varieties, Western Europe should be the focus of Lachenalia marketing and again florists and garden centres are the most lucrative distribution channels. This was confirmed by pot plant growers interviewed in the Netherlands.

3.3 SOUTH AFRICAN FLOWER INDUSTRY

South Africa is a major repository of floristic diversity. It harbours 24 000 plants, equivalent to 10% of the world's species, in an area of less than 1% of the planet's surface area. South Africa is located in an area known as the 'high tropics'; a high elevation combined with tropical and subtropical latitudes. It is a mega-diverse country, one of the most biodiverse countries on the planet. It has seven major biomes of which the Cape Floristic Region (CFR) is the richest floristically, home to an estimated 9600 plant species of which 70% are endemic. The area has a relatively mild climate throughout the year, favourable for flower production.

Despite South Africa's exceptional wealth in unique flowers, relatively little effort has been made to commercialize these natural resources. The flower industry initially focussed on the local market, around the establishment of a local flower auction, Multiflora, in 1945. A few large producers have been dominating the industry since. Exports were traditionally confined to indigenous products such as the Protea, but since the lifting of sanctions in the mid-Nineties, new export-orientated growers have emerged (Van Rooyen, J. 1998; Matthee *et. al.*, 2005).

The value of the South African flower industry increased from R100 million in 1985/6 to R332 million a decade later. The nominal export value was estimated at around R70 million in 1995/6 (Niederwieser *et al.*, 1997). At this stage South Africa maintained the 21st position in the index of world floriculture exporters. According to Matthee *et. al.* (2005), the value of floriculture exports increased from R77 million in 1995 to R269m in 2002, a growth of 20% per annum. South Africa currently exports cut flowers, plants, foliage and bulbs daily, across the world by air. The top floral products in terms of volume and value are roses, chrysanthemum, carnations, gladioli, lilies and irises. Cut flowers account for \pm 60% of floral exports, foliage about 20%, bulbs 17% and plants around 3%. The major markets for South Africa's floriculture products are Europe (65%), the USA (9 %) and Asia (5.2%), according to Matthee *et. al.* (2005).

South Africa has advantages for the production of floricultural products, such as a facilitating infrastructure and climate. Unfortunately, disadvantages include high labour costs and expensive plant material. An important limitation is the lack of transparency in the market and information regarding sales, prices, etc. Still, the local industry has significant growth potential and is regarded as lagging behind in terms of production capacity. Investment is limited and often uninformed: greenhouses and varieties produced are often outdated. South Africa's floriculture market share is only 0.44% of the total world import market, a fraction of its true potential. Reasons for the low share in world exports are the relatively large domestic market, resulting in producers avoiding international quality standard issues by selling locally. This limits the local market's turnover which is

becoming saturated. In order for the industry to survive, exports will have to increase. South Africa also faces increasing competition from its African counterparts especially Kenya and Zimbabwe in terms of cost factors, as these countries have advantages in for example, export volumes and cheap labour. Kenya’s market share of world exports is 2.6%, which is significantly higher than South Africa’s market share of 0.44%. South African producers should develop a competitive advantage by focusing on non-cost factors (e.g. quality) and compete in terms of innovative value chain aspects (i.e. products, production, packaging, logistics, marketing, sales and markets).

The South African floriculture industry can add value through commitment to exporting and by being reliable suppliers of consistent quality products. A supporting environment needs to be established, with the aim to assist exporters in the export of high quality and innovative products to opportunity markets (Kaiser Associates, undated).

According to the International Trade Probe of the National Agricultural Marketing Council of September 2011, the total value of flower bulbs and tubers exports in 2010 was R46 million whereas that of imports during the same period was R27 million. The top 5 countries from which South Africa imports bulbs by order of importance are the Netherlands, New Zealand, Taiwan, Nigeria and Ghana. The Netherlands contributed 98% of imports, followed by New Zealand, Taiwan, Ghana and Nigeria.

The top five important export destinations by order of importance are: the Netherlands, the USA, Sweden, Finland and Japan. In figure 2 the trade balance relating to export and import of Bulbs and Tubers in SA is illustrated.

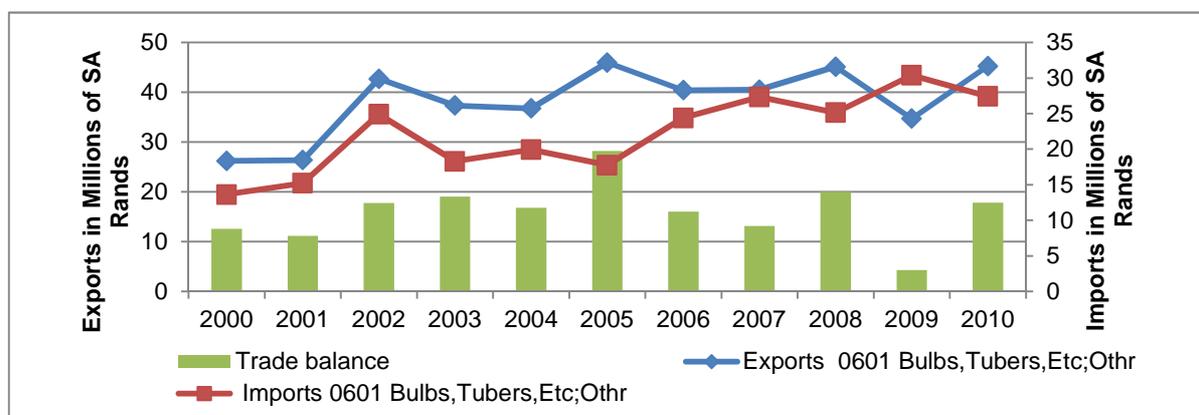


Figure 3.2: Trade Balance for South African Bulbs and Tubers (NAMC, 2011)

The South African Floriculture market for all extent and purposes consists of Multiflora and Flora Direct auctions, as well as the major supermarkets. The supermarkets buy via Flora Direct, selected farmers and import limited quantities in peak months. It should be noted that only Multiflora sales data is available, representing ± 70% of the local market, and that Multiflora is wholly owned by producers. In the 2009/2010 trade season the total turnover of Multiflora was R350 million, dealing in more than 100 species of flowers. Roses represent about 27% of Multiflora’s interest, chrysanthemums ± 16%, lilies 10% and carnations roughly 5%.

The South African Flower Export Council (SAFEC) is a federation of associations, which includes the KwaZulu-Natal Cut-flower Growers Association, the SA Flower Growers Association (representing

Gauteng, Limpopo, and Mpumalanga growers), the SA Protea Producers and Export Association, the dried flowers exporters, a variety of input suppliers and freight companies. In total there are 45 producers, 15 input suppliers and 14 export agents. SAFEC acts as an umbrella body to coordinate industry development and develop exports. These bodies represent more than 90% of all bulb, cut flower and foliage growers (NAMC 2011).

3.4 THE PLACE OF LACHENALIA

Given this background of the Dutch market, Lachenalia, compared to other pot plants, is a relative expensive product. However the market for flowering pot plants and the amount spent on such pots has been increasing steadily. Whilst price could be a limiting factor, there is a niche market for higher priced pot plants. This was endorsed by Gerrit Preijde; a Dutch producer and marketer consulted, who states that the gift market is attractive for Lachenalia because consumers spend significantly more on gifts. By adding value through for example selling the plant in an African branded pot instead of the normal plastic pot, would make it attractive for the Dutch consumer.

Flowers in the Netherlands are distributed through a diversity of channels. The florist is the most important outlet for cut flowers. However, most Dutch consumers only buy cut flowers at a florist when buying them as a gift. When flowers are bought for own use, they are bought at the supermarket or open air market, where it is cheaper. Only 6% of total cut flower sales take place at garden centres, but when it comes to pot plants, garden centres are the market leader with a share of 43% because of their broad assortment. The florist is the second biggest distribution channel for pot plants at 27%, because pot plants are rated as a luxury product and the florist is seen as a high quality distribution channel. Supermarkets play an increasingly important role in Dutch society and especially younger consumers buy products in general, including plants at the supermarket. However whilst the share of supermarkets is large in the UK and Switzerland (50 and 65% respectively), in the Netherlands, France and Germany this share is between 15% and 20%. Especially when flowers and pot plants are bought as a gift, consumers tend to favour florists and garden centres.

The flower and pot plant market is largely driven by the demand of the different distribution channels - effectively representing consumer's preference. Pot plants are divided into spring (January till May) and summer pot plants (starting from May). Research indicated that spring pot plants sales are growing. Usually the offer of summer pot plants is less diverse. According to van Santen (2009) competition in the pot plant market is limited to what consumers see as a value addition. Hence, pot plant growers should pay attention to unique attributes and focus on communicating these attributes. When a novelty is not clearly introduced, the consumer will not recognize it as a novelty. If a pot plant can also be used as a garden plant, this attribute must be clearly communicated to provide a performance differential compared to other pot plants.

In short, competitive advantage is reached through effectively communicating of distinguishing attributes which the consumer sees as value addition (van Kooten and Kuiper, 2009). According to LEI (2006) competition between growers is limited to increase in production scale. In 2005, 1 362 pot plant growers were active, a number which has been decreasing since the nineties and will further decrease because of an increasing production scale per pot plant grower.

It should be noted that quality is rated by the Dutch consumer as the most important purchase criterion. Lachenalia is a unique, quality product compared to other pot plants, if cultivated properly. Its colour variety and long pot life makes it highly attractive, endorsed by several growers in the Netherlands. Mr Preijde felt that Lachenalia currently is the pot plant with the most beautiful colour diversity and best pot life. An additional advantage is that Lachenalia is relatively new and unknown, a characteristic which always draws consumers. The market study confirmed, from the input of various traders, that European consumers are prepared to pay a premium for a unique, quality product, with colour being the most important criteria.

Because the market for pot plants in the Netherlands is largely driven by the demand at the distribution channels, the aim with Lachenalia should be to satisfy these channels. As a novelty, Lachenalia should evoke interest. This was endorsed by interviews with a number of interested parties, including growers at the International Hortifair 2010 in Aalsmeer. This was also emphasized by Nellie Hoek, responsible for Royalty administration and an authority on the flower industry in Holland. According to the RAI the last breeding rights for Lachenalia were given in 1999 and currently only 8 cultivars are registered. This could be a factor in why Lachenalia is currently selling poorly.

Lachenalia’s value would therefore be heightened by establishing a focus on its uniqueness, its colour and long pot life. Introduction of new varieties is imperative in a continuously changing market. This study confirmed that growers aim to supply new colours or attributes that add value. To create new attributes is costly, but if you cannot add value to your product, it is competing simply on the basis of price, which would be highly detrimental for Lachenalia which is relatively expensive.

According to Mr Van der Vossen, the main buyer of Lachenalia from Nieuwoudtville, the product is sold exclusively at the more pricey florists and garden centres. Lachenalia is therefore aimed at the right distribution channels, but fails to fully adhere to the requirements of these channels, specifically in terms of adding value and creativity. This was endorsed not only by the interviews held with various growers and role-players during this study, but also by Research of Productschap Tuinbouw (2010), florists and a garden centre in Wageningen.

Data obtained from the VBN (the Dutch Flower Auctions Association) and Geert van Diepen of DLV (Agricultural Information Office) confirmed that florists and garden centres are the most attractive distribution channels for Lachenalia, with the auction only used products not sold through other distribution channels. Whereas Mr Van der Vossen usually sells Lachenalia for 1.65 euro per pot, this price is not reached at auction (table 3.2).

Table3.2: Auction sales of Lachenalia (VBN)

Year	Price per pot (€)	Pots sold
2000	0.92	39000
2001	1.31	55000
2002	1.19	49000
2003	0.87	83000
2004	0.79	65000
2005	0.99	54000

As stated, Lachenalia pots were sold for €1.65 at the florist or Garden Centre. A major constraint experienced during this study was to determine the cost price of a Lachenalia pot. Mr Van der Vossen was reluctant to provide specific cost, price and profit margins for Lachenalia. He maintained that he 'made very little' with Lachenalia, which was confirmed by one of his employees at the International Hortifair. It can be assumed that selling Lachenalia through auction does barely cover costs, and that that florists and garden centres; i.e. high end distribution channels should be targeted for Lachenalia marketing.

Since Lachenalia has won a variety of prizes on international flower fairs and in magazines, the product has clearly proven itself as a quality pot plant. Lachenalia is currently the only pot plant sold in the Netherlands, produced in South Africa. All other pot plants are produced in Holland, although a number of these such as *Zantheschia* originate from SA. This is another aspect of Lachenalia that could be used in marketing the product.

Hence, it appears that the limited exposure of Lachenalia in Europe is not due to a lack of unique attributes, but more as a result of limited promotion. The competitive advantage that Lachenalia clearly offers, not only as a beautiful, colourful and long life pot plant, but also as a uniquely South African product, has not been fully exploited. Interviews held in the Netherlands confirmed that Lachenalia is a quality product with good colours and a long pot life, compared to other pot plants. This is not effectively communicated to the consumer, to distinguish Lachenalia from its competitors. According to growers, florists, other distribution channels and other role-players, the Dutch consumer, and probably all consumers, would be sensitive to the fact that Lachenalia is produced as part of community development and has a history of 45 years.

According to growers interviewed at the Hortifair 2010 in Aalsmeer, price is of minor consequence, if value adding aspects are highlighted. The sole Dutch buyer of South African Lachenalia last year sold Lachenalia pots for €1.65 euro, Narcissus for €0.90, Hyacinthus for €1.15 and Tulips for €0.92. Lachenalia is more expensive, but according to growers this price is not of importance in the gift market. When sold in a plastic pot in a garden centre, Lachenalia will cost around €5. When value is added, for example through a typical African pot, it is sold for €10.

Mr Van der Vossen is a fairly innovative pot plant grower, compared to his competition, because he does invest in new flower species. He has, according to other growers, developed specialised production knowledge in this regard. However, his weakness is a lack of focused marketing. Lachenalia is currently sold as a normal pot plant and can easily be confused with Hyacinth, which has resembling characteristics but less distinctive qualities and colour variation.

Mr Preijde as a pot plant grower stated that he would market Lachenalia much more aggressively. He would for instance market Lachenalia *as part of a product range, called 'Out of Africa' offering a variety of African pot plants, with product information and a website which will inform the client on where product origin. This product range will be aimed at the gift market, because consumers spend significantly more on gifts. Only by adding value Lachenalia can distinct it from other pot plants. Lachenalia has won many prizes and the experts are very positive about it. But it is sold in plastic pots which limits its competitiveness. Furthermore no information regarding other competitive traits of the flower, such as its place of origin and so forth are communicated to the consumer.*

There is definitely potential for Lachenalia as a high value pot plant on the European market, provided that value is added and that a concerted promotion campaign is launched. In 2005 the export value of pot plants in the Netherlands was €1 715 billion, growing at 6.5% p.a. The flower and pot plant market in Eastern Europe is also growing rapidly, but consumption is still low compared to Western Europe, where potential for Lachenalia is higher. The gift market is most attractive, whilst the florist and garden centre are the most attractive distribution channels. Competition in the pot plant market is fierce, but focused on perceived value addition. It would be imperative to distinguishing Lachenalia from competitors. All distribution channels and consumers are interested in new varieties or colours. Consumers in other countries could be reached through the same distribution channels. The potential in the rest of Western Europe far exceeds that in Eastern Europe.

CHAPTER 4: NIEUWOUDTVILLE COMMERCIALISATION PROJECT

4.1 INTRODUCTION

The Nieuwoudtville flower bulb project was initiated by the ARC in collaboration with Northern Cape stakeholders, as a commercialization effort that would simultaneously address unemployment and development in the area. Nieuwoudtville was identified in 1996 as the ideal site for *Lachenalia* production in a community setting: the climate was suitable, water and communal land was available. The Northern Cape Department of Agriculture was appointed as the implementing agency. Other stakeholders included the Nieuwoudtville Local Development Forum (LDF), the Industrial Development Trust (IDT), the reconstruction and development trust (RDP) office, the Northern Cape Provincial Cabinet as well as the ARC. Apart from the ARC, none of the stakeholders are still involved. VOPI was contracted to supply training and technical support on a monthly basis and an amount of R690 000 was made available for the project. A market for 20 million bulbs was envisaged.

The first planting was made in April 1997 on 300 m², and the initial objectives were training and evaluation of the production system. Infrastructure including irrigation for 1 ha, a large building with working area, store rooms and an office, a moveable shade net structure, wind breaks, fencing and a bulb sorting system was established by contracting people from the community. In the second season (1998) the production area was increased to 2228 m². More than half a million bulbs were planted. At the end of the season, the first 12 000 bulbs were exported. Institutional problems became evident: Ownership and management of the project, the establishment of a company, differences between the management and the municipality, identification of devoted project members, and a lack of knowledge of business management skills were identified. To date, Nieuwoudtville has produced between 200 000 and 1 million bulbs per annum, most of which is exported to the Netherlands, by the Dutch bulb farmer, John van der Vossen. The project receives bulbils for further production into marketable-size bulbs from a propagator (Afriflowers).

The main objective of this chapter was to determine the impact of the Nieuwoudtville commercialization effort: what value has been created for the ARC, actors in the value chain and for South African society. The model was evaluated in terms of potential for replication to other communities. In combination with the results with market potential, the value chain was analysed. The IP (e.g. royalties) regime for *Lachenalia* was also explored.

4.2 LACHENALIA VALUE CHAIN ANALYSIS

The data and information discussed and analysed in this section was obtained through interviews with all actors in the *Lachenalia* chain and the various documents submitted to the team. Based on this data the *Lachenalia* chain is described in figure 4.1. The phases of the value chain and the actors involved are described in this chapter.

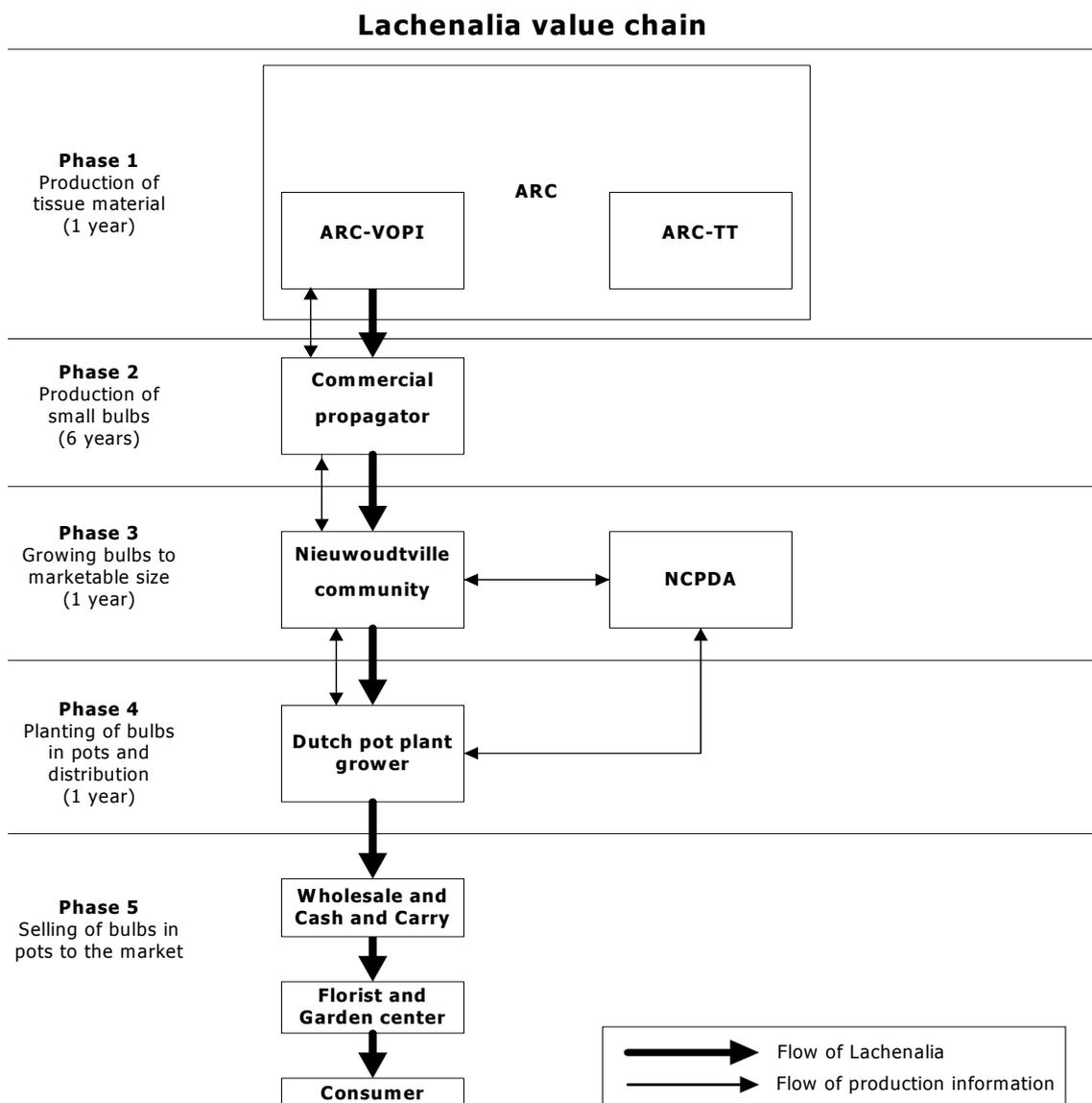


Figure 4.1: The Lachenalia value chain (Mangnus, 2010)

The Lachenalia value chain consists of five distinct phases. Except for phase 5, where various actors (consumers) are involved, all other phases consist of single actors.

4.2.1 ARC-VOPI – MOTHER MATERIAL

The Vegetable and Ornamental Plant Institute (VOPI) of the ARC has developed all commercially available Lachenalia varieties and owns the available intellectual property that is still valid. At this stage its main function in the value-chain is to produce disease free tissue material, which is sold to one propagator; Afriflowers, once per year. The development of this mother material takes roughly 1 year. The institute further renders technical support to different actors in the value-chain. Research is limited to investigation of a production system, a limited crossing program and basic research in cooperation with universities. Currently institutions in Poland, Germany and Italy are researching

Lachenalia cultivation and there is on-going collaboration with VOPI. Current income generated from Lachenalia commercialization entail sales of disease-free tissue material and royalty income.

4.2.2 AFRI-FLOWERS – COMMERCIAL PROPAGATOR

Initially the multiplication of mother material into bulbils was handled by the ARC. During 2000, VOPI decided to stop the multiplication of disease-free tissue material on the basis of costs. Especially labour cost was prohibitive and could not be offset by income. Bulbils are currently sold at 20 cents each (R20 for 100 bulbils) whereas one unit of disease-free tissue material is sold at R4, from which 100 bulbils can be produced. Labour costs involved are significant, and since the ARC employs relatively expensive labour, the ARC multiplication process was terminated.

Initially, private multiplication was done by Labolia, to be followed by Afribulb. Labolia was owned by Ms Fransie Hancke and Ms Eliza Louw, both former ARC researchers. Afribulb was owned by Ms Fransie Hancke who became sole owner of Afriflowers, currently responsible for multiplication. Both Labolia and Afribulb no longer exist, indicating the tight economic margins within the value chain, specifically in the propagation of mother material.

Apart from Lachenalia, Afriflowers also propagates other indigenous flowers such as Zantedeschia and Eucomis. It buys Lachenalia tissue material from the ARC and grows this for six years to produce small bulbils. These types of bulbs are typically then grown to marketable sized flower bulbs by private nurseries, in this case the Nieuwoudtville project. Afriflowers has 6 permanent and 4 temporary workers. There is a direct link between the number of bulbs Afriflowers produces, and the Lachenalia bulbs sold in the Netherlands. Afriflowers receives bulbil orders from the extension officer at Nieuwoudtville, who receives guidance in this from Mr Van der Vossen.

4.2.3 NIEUWOUDTVILLE COMMUNITY – BULB PRODUCER

The Nieuwoudtville project was initially seen as an exit strategy for the Lachenalia research programme. The plan was to initiate this and perhaps other projects, and to eventually hand over all responsibilities to the communities involved. However, this study established from project members and the NCPDA representatives that no exit strategy has been planned or is being contemplated.

None of the initial beneficiaries are still involved, but a few initial beneficiaries were interviewed and they agreed that the project had empowered them, contributing to their current professional employment. The current project leader, Anna, has been with the project since 2000, when she started as a seasonal worker. Most of the workers joined to gain employment, but state they enjoy the work because it is close to home, deals with a nice product and is fulfilling, despite being hard work. Most of the workers had no other source of income at the time of joining. In most cases the beneficiaries come from an extended family of 4 to 7 members. Apart from income from the project, social grants and pensions are additional sources of income of most households. Anna earns R95 per day, and the other three permanent workers earn R70 per day, whilst the 15 seasonal workers earn R60 per day. More than 80% of participants live in RDP houses. Only 4 people out of 20 interviewed used the income earned to buy anything other than food or pay municipal rates.

The age composition varied from 21 to 58 years. The four permanent workers are aged between 45 and 58 years. More than 80% of participants in the project are female. According to the supervisor, the delicate nature of the business is ideal for women who tend to be more accurate in handling bulbs. Most (96%) of the women have children of school-going age. Whilst child-support-grant from government is an important source of income, it supplements their earnings from the project.

Neither the project leader nor any other workers had an understanding of the financials of the project. They do not know what the costs or income elements of the project entail. Whilst workers know what the day to day management of the plantings entail, no one has a grasp on the financial implications. Beneficiaries have no awareness of the ARC and its role in the project, and as far as they are concerned, it's a project run by the Departmental and Mr van der Vossen. All beneficiaries state that they gain meaningful income and skills from the project. A limited number of bulbs are sold to tourists at R40 per 100 bulbs, after the higher quality bulbs have been exported.

The bulbils bought by Mr Steenkamp (on behalf of the Nieuwoudtville project) from Afriflowers are between 3 and 5mm. Fransie from Afriflowers visits the project occasionally. The beneficiaries do not know at what price the bulbils are bought. Other inputs such as fencing, fertilizer, chemicals, etc., are brought by Mr Steenkamp, who visits the project twice a week. The offices of the Department of Agriculture are based in Calvinia, roughly 70 km from Nieuwoudtville.

The workers are transported to and from the project (roughly a 7km trip) by a transport business in Nieuwoudtville. They work from 8 to 5, but the first group arrives at 7am. It was calculated that the transport cost would entail ± R1700 per month, paid from project funds. The casual workers work from January to mid-July – and again from October to December.

During January the soil is ploughed and prepared manually into a very fine seedbed that is treated with pesticide. Subsequently holes are pressed in the soil and a bulbil is planted in each hole, from the 15th of March onwards. Aftercare includes fertilizing and watering, and disease treatment. Bulbs start flowering from end June until September. Bulbs are harvested in October after the growth has died off. After harvesting, bulbs are dried, cleaned by hand and classed; a process that is labour intensive and requires care. The bulbs harvested are not counted, but losses are minimal. Roughly two thirds of the harvested produce is directly marketable, with the rest being too small. These smaller bulbs are replanted the next year or sold locally. In order for the bulbs to be sold internationally, a phyto-sanitary certificate is required, which is duly supplied by the relevant authority. In 2010 a total of 480 000 bulbs were planted, significantly more than in 2009.

Whilst the answers from the beneficiaries were guarded, almost too positive, some did indicate that they would like to know more about the project so that they could understand the business. According to the workers John v/d Vossen visits the project three times each year - and checks if the bulbs are properly cultivated. The team leader does not know what Van der Vossen pays for the bulbs. She did mention another nursery from the Cape (Showers of Flowers) that regularly bought bulbs after the bulk was exported.

According to Mr Gert Steenkamp, the NCPDA project manager, he has been with the project since 1997, shortly after its inception earlier that year. The Lachenalia project is self-sustaining and profitable. In February 2010, the project had a positive bank balance of roughly R370 000.

Steenkamp stated that marketing and negotiating with buyers is his main contribution. The project could easily produce in excess of 3 million bulbs p.a. There is currently one major buyer, but a number of small local buyers do exist, which supposedly provides leverage to negotiate with Mr van der Vossen on the price paid for bulbs. Expanding sales to tourists is not a good idea according to Mr Steenkamp, as the workers would not do their work.

Mr Steenkamp was not willing to provide exact numbers of bulbs sold, only that more than 50% of the bulbs produced are bought by Van der Vossen. According to other stakeholders, it might be close to 90%. Three payments are apparently made but it was not clear when these payments were received. This depends on the extent of virus infection, which apparently only manifests itself in Holland. Van der Vossen would indicate the extent of virus infection (supported by a picture sent electronically), on which final payment was based.

Mr Steenkamp mentioned that the agreement with V/d Vossen was that bulbs under a certain size could be sold locally. Apart from Hadeco, he refused to name other buyers. He indicated that he was not going to answer all our questions, and that he had informed the head of the NCPDA accordingly. Mr Steenkamp is the decision making authority for the project, reporting to Ms Jackie Maisela, a chief director in the NCPDA. He could not provide data on the initial investment and was sceptical if the Department would provide such data. This proved to be true as various attempts to obtain project data for the project from the offices of the Department had been unsuccessful. Personal calls and letters, even from the ARC's CEO to the HOD of the Department, were ignored. The extension office in Calvinia did fax datasheets with cost and income data to the ARC, but this was incomplete and not sufficient for cost benefit analysis. It is concerning that no data can be provided for an official, registered Departmental project, which supposedly is audited.

Mr Steenkamp acknowledged that empowerment at the project is lacking, but maintained that this was the only viable model at this stage. He argued that capacitating a local person would not be sufficient, as the project required sophisticated networking abilities that someone local could not have or develop. Especially with regard to the marketing of Lachenalia and what he perceives as the on-going battle against viruses, external management is required.

Mr Steenkamp does all the procurement for the project himself. He deals with the Cooperative in Calvinia only, who assist him to obtain quotes from the required other suppliers. The Coop then provides the required inputs at cost plus 3%. All transactions are recorded in the project's account and all revenue is directly paid into the project account, apart from the cash sales to tourists, which is used for the end of year function. This was apparently \pm R2000 per year. The project workers' salaries are paid by the local municipality, who bill the Department for the amount and a 5% handling fee. This is done so that Mr Steenkamp does not have to handle the cash.

As mentioned, the NCPDA was not forthcoming in sharing financial data on the project even after repeated requests and high level communication. It also appears reluctant to empower local beneficiaries on the fear that the project will collapse. The relationship within the value chain is worrying, and procurement and payment procedures are questionable. The lack of transparency and response to requests for information of a publicly funded project, from a public institution is unacceptable.

Some positive socio economic gains can be reported. Empowerment did occur through the project, whilst the salaries earned contribute significantly to a number of livelihoods in Nieuwoudtville. Skills transfer and general agricultural awareness has been developed, which also contributed to other projects in the area, such as the Rooibos project.

The project employs between 20 and 40 people, depending on the time of year. Income entails roughly R18 000 p.a. for the 4 permanent workers and R10 500 p.a. for the casual workers, if employed three months in the beginning of the year (preparation of beds and planting) and three months late in the year (during harvesting). Beneficiaries described working at the project as decent employment, as Nieuwoudtville is a relatively poor town where job opportunities are limited. Most of the workers have a low skill-base and have never been employed and most are illiterate. Hence the bulb-production project provides a unique opportunity to earn a livelihood.

Support rendered by the Northern Cape Provincial Department of Agriculture (NCPDA) is noteworthy. The Department was involved with facilitation of the initial grant from the Reconstruction and Development Programme, used to finance establishment of the project. The Department provides technical support and fulfils administrative functions on behalf of the beneficiaries. While this arrangement is not ideal as it limits empowerment, it does indicate that the Department is committed to the project.

The role of the ARC-VOPI in the project is not optimal – it is not recognised at all as an important provider of technical know-how and the material on which the project is based. It should also contribute more effectively in empowering beneficiaries and marketing output.

4.2.4 BULB BUYER - VAN DER VOSSEN

Mr Van der Vossen was initially approached during the 1980s by the ARC, on the advice of a Dutch Flower Association. In an interview Van der Vossen indicated that he saw the potential of Lachenalia and started working with a South African flower grower. Lachenalia was at the time tested at various localities at the time, of which Nieuwoudtville proved to be the best. Van der Vossen owns a nursery and produces a variety of pot plants; including Tulips, Narcis, Hyacints, Chionodoxas, Aloha Lilies, Crocosmias, Puschkinias, Eucomis, Crocus, Muscaris, Glaminis, Freesias and Irises. He states that Lachenalia is of limited importance in his business and constitutes less than 5 % of his production, but he could or would not provide more exact figures.

Van der Vossen grows Lachenalia during winter, to be sold in the spring in Europe. To ensure synchronized (even) development he explained that he uses inhibitors and temperature manipulation. Light manipulation, as suggested by the market study, was not mentioned. He confirmed that he visits Nieuwoudtville 3 times per year, where he negotiates with Mr Steenkamp. The amount of bulbs bought is based on an oral agreement that all clean bulbs produced will be bought. Yet, he only pays for the bulbs he actually sells again. Van der Vossen also meets with ARC staff, but not as regularly. He believes the ARC view of Lachenalia as a 'money machine', is mistaken, but agrees that marketing is critical.

According to Van der Vossen, Lachenalia is only potted in the Netherlands. Two partners in the USA run production tests with Lachenalia, but he is sceptical. More than ten growers in the USA, who experimented with Lachenalia, have subsequently abandoned it. The number of bulbs he buys in South Africa varies extensively each year. Between 4 and 5 million bulbs were grown in 2000, most of which were lost due to virus infection. He suggested scaling down and gradually increasing production to eliminate viruses. Due to sound control most viruses were eliminated and bulb production grew to roughly 500 000 bulbs in 2010, but the virus risk remains. Hence he visits Nieuwoudtville three times per year, to pre-select clean bulbs, but he maintains that virus infections are again found in the Netherlands.

Van der Vossen trusts Mr Steenkamp, whom he negotiates with. Van der Vossen accepts that there is no control mechanism for the agreement and therefore he respects Mr Steenkamp, without whom the project in his opinion would have long been shut down. Van der Vossen confirmed that he also each year buys most remaining bulbs of a certain size and quality, whilst he himself sells to Hadeco in South Africa, after which he transfers the full payment to the NCPDA. He didn't want to discuss this transaction in depth, maintaining that it dealt with low quality bulbs of less importance.

Van der Vossen presented Lachenalia successfully at many occasions, won many prizes and appeared in many publications, leading to much interest from growers in the USA, with no real commercial production resulting as yet. Lachenalia is sold throughout Europe through the extended Dutch distribution network and Van der Vossen has no problem selling the pots. A small number of bulbs are sold to a firm in Holland that sell plastic bags of five bulbs per package. Van der Vossen sells these at cost price and states that he doesn't earn anything from this transaction. He has many Lachenalia pictures taken by specialized flower marketing bureaus to interest distributors. He also states that it won't be a problem to sell more potted bulbs, whilst moments later contradicting this by stating that the demand isn't high, but that his extended network across Europe entails a huge market for export of potted plants.

Van der Vossen repeatedly mentions the virus problems as having a huge impact on the potential of the product. Only once these problems are solved, Lachenalia will reach its potential. It has a long pot-life, a high amount of flowers and a beautiful variety of flower colours. Currently the virus problems overshadow its potential. The limiting factor is cost price. Virus problems are prevented by constant, costly control and screening of the bulbs. The sterile working environment required drives up the cost price. This according to Van der Vossen means that the bulbils bought from Afriflowers are currently too expensive.

Van der Vossen stated that another problem is uneven flowering. Uneven flowering is not an issue if the difference is a few days, but with Lachenalia it can be two weeks. He used to sell three bulbs per pot, but flowers grew unevenly and now he plants five bulbs per pot, to ensure that at least three start flowering at more or less the same time. Still, the appearance of the pots isn't perfect.

Van der Vossen has invested heavily in Lachenalia, but up to now it has only cost him money, and he only remains involved as he still believes in its potential. Once the virus problem is solved, Lachenalia can reach its potential, but there is a long way to go. He views his involvement at Nieuwoudtville as his contribution to development and maintains that Lachenalia is of very small financial importance to his company. However, when confronted with an article in the journal *Bloembollen visie* (2010),

where he stated that pot tulips and Lachenalia are his primary products, he was unwilling to explain this, or answer further questions, on the basis that he did not have time and does not know all the figures by heart. John van der Vossen was in general reserved in giving information and evasive in giving exact numbers. As far as he was concerned, for Lachenalia to reach its significant potential, the virus and uneven flowering problems need to be eliminated.

Van der Vossen pays royalties on the bulbs sold to the consumer – and not on those obtained from Nieuwoudtville. Royalty income amounts to 2.5 eurocent per bulb, which he perceives as high, but acknowledges that it is probably insufficient to cover ARC research costs. There is no checking mechanism on the amount of bulbs sold by Mr Van der Vossen and only he knows how many bulbs are lost. However, according to Nellie Hoek from RAI, the control system for royalty payments works perfectly. Royalties received over the past five years from 2005 to 2009 have been low; R40 000, R30 000, R35 000, R33 000 and R20 000 respectively. In contrast, the ARC investment on the Lachenalia programme exceeded R1 million p.a.

Mr van der Vossen sells bulbs to wholesalers and retailers throughout Europe. Florists and garden centres order Lachenalia directly from Van der Vossen, after which it is sold to the consumer. What is not sold to wholesalers and cash and carries is sold through auction. The bulbs are sold throughout Europe, mostly at luxury distribution channels like garden centres and florists.

4.4 CONCLUSION

The fact that the value chain is effectively dependent on a verbal agreement with Mr Van der Vossen as the only buyer is problematic. The monopolistic business model is anti-competitive, restrictive and exclusive, effectively barring new entrants into the Lachenalia value chain. This poses a severe risk to the ARC, as a public entity mandated to support growth and expansion of the sector. Over the past fifteen years, the ARC has spent at least R3 million in developing six new cultivars, which has up until now empowered one grower from the Netherlands, one local propagator who is an ex-ARC employee, and has resulted in casual labour opportunities for roughly 40 beneficiaries, of which none has currently have any entrepreneurial skills as a result of the investment. Whilst this is a very harsh conclusion, it is clear that remedial steps are urgently required to salvage the situation. Urgent steps need to be taken to avoid legal ramifications (Competition Act, 1998), even despite the fact that the current arrangement does maintain exports. It does however clearly fail to promote further exports; the ability of small businesses owned by historically disadvantaged persons, to become competitive.

According to Albinger (2009) a monopoly entails a lack of competition; where one company owns a significant portion of the market place. Case and Fair (2004) define a cartel, as a business model where a group of firms collectively make price and output decisions to maximise joint profits. Partners in the cartel system collude on price. From the information obtained, and the interviews conducted, the existing value chain clearly resembles both monopolistic and cartel elements, which is forbidden by South African law (Competition Act of 1998).

The contradiction between Van der Vossen's insistence that Lachenalia's importance in his company is small, and the article in Bloembollen visie (2010) is concerning. The apparent contradiction

between Steenkamp and Van der Vossen on the one hand, who argued that Lachenalia sales are limited by virus infestations, and the ARC and Afriflowers on the other hand, who as convincingly argue that virus problems no longer exist, is puzzling. According to Hancke from Afriflowers: *“There are no virus problems in South African Bulbs. I supply bulbs to Nieuwoudtville that are clean and any one is welcome to visit my farm at any time for inspections. I also visit Nieuwoudtville once a year to inspect their plants for virus infections. Since I have adapted my multiplication system the virus problems are something of the past.”* This is supported by Geert van Diepen of DLV who states: *“when tissue material and small bulbs are virus free, chances of virus problems are limited to a minimum”*. Nonetheless, the contradicting answers received at a minimum illustrates that information flow within the value chain is not optimal.

Van der Vossen has the complex know-how on how to grow high quality Lachenalia pot plants in the Northern hemisphere and represents the only distribution channel available currently. What is of grave concern is his commitment as buyer, as he apparently made it clear at Nieuwoudtville that he would withdraw if bulbs are not exclusively sold to him. He is currently the only notable commercial Lachenalia pot plant grower. His response to questions about the business, especially as regard to financial information and the way in which the pot plants are produced, suggest that this is a profitable situation. He views the Lachenalia production practices he developed for Europe as his trade secret, although these are probably variations of treatments used throughout the industry, dealing with application of light intensity and temperature, to stimulate even plant growth and flowering. This information would be highly relevant to new entrants into the value chain, especially regarding growing Lachenalia in Europe, where the seasons are reversed to those in South Africa.

Lachenalia production is a sophisticated business, requiring specific climatic conditions, expertise, and management skills. Various companies attempted to produce Lachenalia over the past 14 years, all of which experienced severe problems at some stage. With one exception, all of these withdrew or declared bankruptcy. One can draw the conclusion that Lachenalia is not profitable. Still, the people active in the value chain, as well as role-players in the industry interviewed both in R&D and in the flower business, are convinced that Lachenalia has unique characteristics and economic potential for commercialisation. The difficulties experienced by all actors in the value chain might have contributed to the current nature of the value chain.

Signs of maladministration were observed at the Nieuwoudtville project. Various procurement and pricing mechanisms found were highly questionable in terms of the competition act. Community beneficiaries are currently reduced to short term, casual labourers, not registered with the Department of Labour. The critical question is if the current value chain is serving the interest of the South African Society, the ARC, the community involved and potential participants in Lachenalia production. It could even be asked if the current value chain is legal.

Strategic issues include the need for re-orientation or expansion of the value-chain to stimulate competition; a transparent, collective agreement on pricing, payment based on product delivered and not sold; the administration and collection of royalty income; and facilitating ownership of beneficiaries. There is also need to develop a monitoring and evaluation system. VOPI should consider partnership with public entities such as DTI and NAMC, to intensify commercialisation and marketing efforts locally, in Europe where expansion is likely, and in the US and Asia.

CHAPTER 5: SWOT ANALYSIS OF LACHENALIA CHAIN

5.1 INTRODUCTION

A SWOT analysis describes the Strengths, Weaknesses, Opportunities and Threats of an intervention and can assist in strategic, long term planning (Keller et al., 2006), and involves the collection and portrayal of information about internal and external factors which impact on business (Pickton, et al., 1998). In this chapter the results of the market study and value chain analysis were integrated and evaluated through a SWOT analysis to identify strategic issues on which a corrective strategy could be based. Internal factors are evaluated in terms of relative strengths and weaknesses whilst external factors are evaluated in terms of opportunities and threats. The question dealt with is what issues the ARC can address to improve access into the Lachenalia value chain.

5.2 Strengths

1. Lachenalia research history of 45 years – quality cultivars registered with PBRs
2. Complete Lachenalia gene bank established and built maintained
3. Production system for disease-free tissue material - positioned to supply market
4. Sound cultivation guidelines established
5. Self-sustaining, profitable community project, impacting on ± 40 livelihoods
6. High quality plant, long pot-life, beautiful colour variety - global marketing potential
7. Extensive local & global network, linkages with growers, agencies, higher education
8. Infrastructure supporting export excellent

5.3 Weaknesses

1. R&D effort poorly sustained; regular funding interruptions
2. Despite huge investment, commercialisation limited - poor uptake, bankruptcies
3. Lachenalia a relative expensive, complex product requiring technical skill
4. Programme inherently supply-led, not backed by comprehensive market intelligence
5. Insufficient marketing and technology transfer support to value chain.
6. Lack of empowerment and community ownership in Nieuwoudtville
7. Value chain a severe risk to the ARC, as a public entity mandated to support growth and expansion of the sector – currently not serving the interest of Society
8. Process for synchronised development in Northern Hemisphere not known here

5.4 Opportunities

1. Global flower trade worth in excess of US\$40 Billion p.a. –market for Lachenalia bulbs
2. Market for pot plants and amount spent on such pots increasing – gif market - estimated growth in European pot plant consumption foreseen
3. Florists and garden centres - the most attractive distribution channels for Lachenalia
4. SA floriculture industry has significant growth potential - lagging behind capacity.
5. Can attract entrepreneurs from disadvantaged communities and provide employment in a poor area with limited job opportunities
6. Lachenalia has won prizes on international flower fairs and in magazines – can do so again
7. Add value with product information – consumers will be sensitive to Lachenalia story
8. Partnership with public entities (DTI, NAMC), to intensify commercialisation

5.5 Threats

1. Funding of the ARC
2. Virus infections
3. Complex, specialised, exclusive difficult value chain – several bankruptcies
4. Increasing competition from African counterparts
5. Maladministration at Nieuwoudtville - procurement and pricing mechanisms questionable in terms of the competition act
6. Beneficiaries reduced to short term, casual labourers
7. Buyer providing contradicting, evasive info, threatens to withdraw, has vital info
8. Lack of empowerment and community ownership in Nieuwoudtville

5.6 CONCLUSIONS AND RECOMMENDATIONS

If a strategy to continue commercialization is to be developed, it should be built on the advantages inherent to the product and the local environment; and it should address the issues that threaten to derail growth and commercialization. A number of issues should be recognized:

Lachenalia is a high potential, unique, prize winning product that with the right marketing has extensive potential for profitable release on the European market, where growth in especially pot plant sales is foreseen. Entry into the European market, through the Dutch system which controls the world floriculture market, makes most sense at this stage. The ARC should use its extensive network to expand commercialization and should explore partnership with other relevant stakeholders such as the DTI and NAMC. The ARC can provide guidelines and support for local growers, assuming sufficient funding. Whilst there are empowerment and management issues to be addressed at Nieuwoudtville, the project has proved that community based production is possible. Empowerment of local growers from disadvantaged communities is a specific challenge that needs to be addressed. National infrastructure required for an export oriented business, is in place.

Commercialisation will require dedicated and focused support, perhaps through development of SMME's, to ensure that skills development and complex technical processes are mastered. Empowerment and ownership at Nieuwoudtville and other potential sites will be crucial. A main issue to be dealt with, perhaps in collaboration with existing and new growers in the Northern hemisphere, would be to establish and document the process followed to ensure synchronised bulb development, which is currently a trade secret held by the only buyer. It will also be critical that the Lachenalia breeding programme continues as the market continuously demands new varieties.

Given the size and scope of the flower bulb market, in Europe alone, there is potential to produce and market far more bulbs than is currently taking place, and at least one more local grower or community could be involved in Lachenalia production in the short term, with possible expansion as the market expands. It will be important to involve growers and agencies in Europe, and to ensure that the distribution channels identified for Lachenalia (florists and garden centres), are targeted. The full Lachenalia story should be told, which would add value and improve sales. Value adding has been established in the market study as crucial, given the competitive nature of the European flower bulb market.

Finally, threats to the programme have to be recognised and dealt with: Funding of the continued R&D and commercialisation programme is crucial – without adequate resources the mistakes of the past will be repeated. The commercialisation programme should recognise the need for skills development, empowerment and social mobilisation in order to ensure ownership of local growers, particularly in poor communities. The current value chain needs to be expanded and reoriented. Issues of maladministration at Nieuwoudtville need to be investigated. The current buyer has to be engaged and either convinced to cooperate in expanding the value chain, or given the option to withdraw. An appeal should be made to obtain the procedure for synchronised bulb development in the northern hemisphere, crucial for attractive pot plants.

Economic analysis, required to provide quantitative answers, was difficult, due to a lack of data to calculate return on investment accurately. However, the qualitative data clearly indicates significant scope for expansion of the Lachenalia programme.

CHAPTER 6: ECONOMIC ANALYSIS OF LACHENALIA CHAIN

6.1 INTRODUCTION

A key objective of the study was to determine the viability of expanding the commercialization of Lachenalia. The Lachenalia R&D constitutes an investment, made on behalf of the public, and the returns to this investment are relevant to the ARC and society. Hence decision makers and project managers need an understanding of the rate of return on this investment, in order to correctly allocate resources on the basis of informed decision making. Practically, the question is if it will be economically viable to continue investment, or if the programme should be terminated.

By virtue of its mandate the ARC is not expected to generate profit, however it is expected to ensure that public investment is used to expand knowledge and contributes to economic development and growth. A general rule within the ARC is that a 30% cost recovery is aimed for and the percentage cost recovery will therefore be specifically noted.

Of concern was that many of the cost and income items for the ARC, the propagator and the Nieuwoudtville project were not available, or not made available. This severely limited the economic analysis, and to some extent the conclusions drawn. However, common sense was used in interpreting the various results that were obtained, especially through the market study.

Economic analysis was done for two parts of the value chain; the R&D and commercialisation investment and the Nieuwoudtville project. Performance of Lachenalia over the past 13 years is loosely evaluated against targets projected during the Impact Assessment of 1997. The average real interest rate between 1997 and 2010 was 8.3% and the average inflation rate was 7% (Statistics South Africa). Table 6.1 defines the financial indicators examined. Whilst the Lachenalia value chain consists of four distinct phases, only the two under discussion are elaborated upon.

Table 6.1: Framework for financial analysis

	ARC	Nieuwoudtville Project
Sources of income	disease-free tissue material, royalties & consultancy services	Bulb sales
Inputs	cost of research, infrastructure, overheads, labour cost, interest rate, inflation	Infrastructure, marketing, overheads, interest rate, inflation, taxes
Policy Benchmark	30% rate of cost recovery, break-even point	Profitability
Financial indicator	NPV	Gross Margin, profit
Economic Indicator	RoR, job creation, academic achievements	RoR, job creation, environmental impact

6.2 Value analysis of ARC-VOPI – Lachenalia programme

Based on the information provided by ARC-VOPI, income at the beginning of the project was relatively high, but declined sharply since 2001 (Table 6.2).

Table 6.2: Income and expenditure stream for Lachenalia technology at ARC-VOPI

	Royalty income	Sales	Total Income	Expenditure	Profit/Loss
1997	R 0	R 62 665	R 62 665	R 38 533	R 24 132
1998	R 0	R 99 897	R 99 897	R 47 790	R 52 107
1999	R 0	R 319 094	R 319 094	R 65 415	R 253 679
2000	R 0	R 296 801	R 296 801	R 170 498	R 126 303
2001	R 0	R 1 541 669	R 1 541 669	R 503 297	R 1 038 372
2002	R 0	R 265 323	R 265 323	R 184 721	R 80 602
2003	R 0	R 214 203	R 214 203	R 211 394	R 2 809
2005*	R 44 344	R 3 964	R 48 308	R 56 224	-R 7 916
2006	R 0	R 960	R 960	R 23 349	-R 22 389
2007	R 40 166	R 480	R 40 646	R 62 846	-R 22 200
2008	R 56 435	R 0	R 56 435	R 45 037	R 11 398

Since income and expenditure data have been provided in nominal terms these were converted to real terms in table 6.3.

Table 6.3: Summary of deflated expenditure streams for Lachenalia at ARC-VOPI

	CPI Index 2000 = 100	Total Income	Expenditure	Profit/Loss
1997	84.4	R 74 248	R 45 655	R 28 592
1998	90.2	R 110 751	R 52 982	R 57 768
1999	94.9	R 336 242	R 68 930	R 267 312
2000	100.0	R 296 801	R 170 498	R 126 303
2001	105.7	R 1 458 533	R 476 156	R 982 377
2002	115.4	R 229 916	R 160 070	R 69 846
2003	122.1	R 175 432	R 173 132	R 2 301
2005	128.0	R 37 741	R 43 925	-R 6 184
2006	134.0	R 716	R 17 425	-R 16 708
2007	143.5	R 28 325	R 43 795	-R 15 470
2008	160.2	R 35 228	R 28 113	R 7 115

Based on a 30% recovery rate of cost, the Lachenalia programme can be deemed sustainability (table 6.4). Only during 2006 the 30% threshold could not be reached. However, it should be argued that income was far from optimal and that improved cost recovery should be aimed at, if the Lachenalia programme is to continue: It could be argued that the ARC should be able to demonstrate to its shareholders that the organization is able to recover cost of its R&D work and more importantly, that its R&D enables the beneficiaries of its technologies to attain competitiveness in the market place, and run their businesses in a sustainable manner. In this argument, it should be indicated that

resources invested in R&D bear opportunity costs (areal-time value for money); hence when analysing R&D investment the results should be benchmarked against other possible investments such as earning interest from investment in government retail bonds.

Table 6.4: Cost recovery threshold analysis on direct cost

Year	30% Direct deflated cost recovery threshold	Threshold made yes/no
1997	R 13 697	Yes
1998	R 15 895	Yes
1999	R 20 679	Yes
2000	R 51 149	Yes
2001	R 142 847	Yes
2002	R 48 021	Yes
2003	R 51 940	Yes
2005*	R 13 178	Yes
2006	R 5 227	No
2007	R 13 139	Yes
2008	R 8 434	Yes

The deflated figures in table 11 (2000 as base year) indicate losses in 2005 – 2007. Average income and expenditure indicate sustainability over time as illustrated in Table 6.5.

Table 6.5: Average income, expenditure and profit/losses for the period 1998 - 2008

	Total Income	Expenditure	'Profit/Loss'
Average for the last 10 years	R 270 968	R 123 503	R 147 466

Figure 6.1 illustrates the total income, expenditure and profit loss of the ARC. The spike in 2001 was a result of high sales, which also serves as an illustration of Lachenalia’s potential in the market.

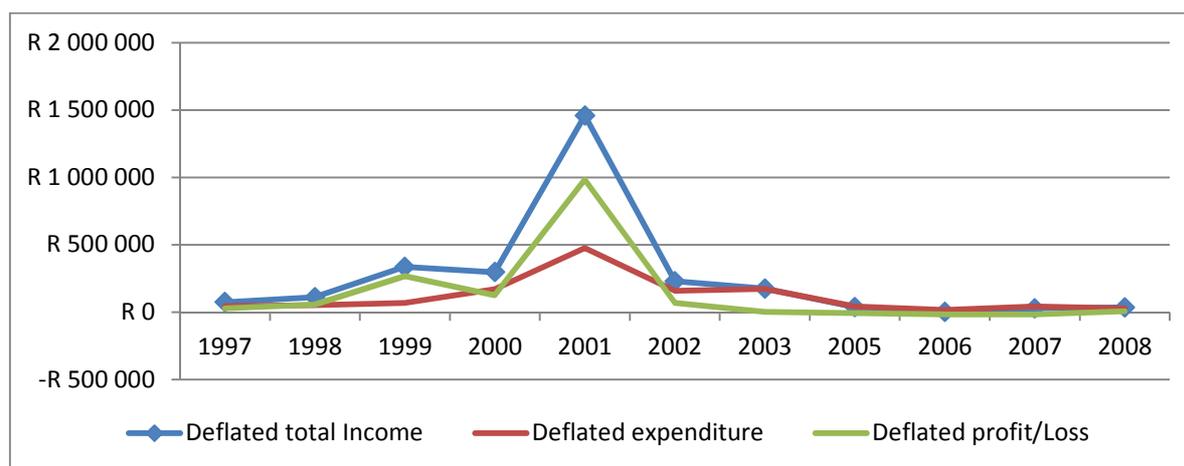


Figure 6.1: Deflated total income, expenditure and profit/loss of the ARC

6.3: Value analysis of bulb production at Nieuwoudtville

In table 6.7, nominal income and expenditure streams of the Nieuwoudtville project are provided, whilst table 6.8 describes the same information in real value terms, using 2005 as base year.

Table 6.7: Income and expenditure stream at nominal value

Year	Sales	Expenditure	Profit/Loss
2005-06	R344 705	R253 014	R91691
2006-07	R449 639	R442 608	R7031
2007-08	R296 672	R278 911	R17761
2008-09	R280 338	R252 309	R28029
2009-10	R135 654	R251 850	-R116196
Totals	R 1 507 008	R 1 478 693	R 28 315
Averages	R 301 402	R 295 739	R 5 663

Table 6.8: Deflated income and expenditure stream

Year	CPI Index 2000 = 100	Sales	Expenditure	Profit/Loss
2005-06	100.0	R 344 706	R 253 015	R 91 691
2006-07	107.2	R 419 439	R 412 881	R 6 558
2007-08	118.8	R 249 724	R 234 774	R 14 950
2008-09	160.8	R 174 340	R 156 909	R 17 431
2009-10	172.8	R 78 503	R 145 746	-R 67 243
Total		R 1 266 712	R 1 203 324	R 63 387
Averages		R 253 342	R 240 665	R 12 677

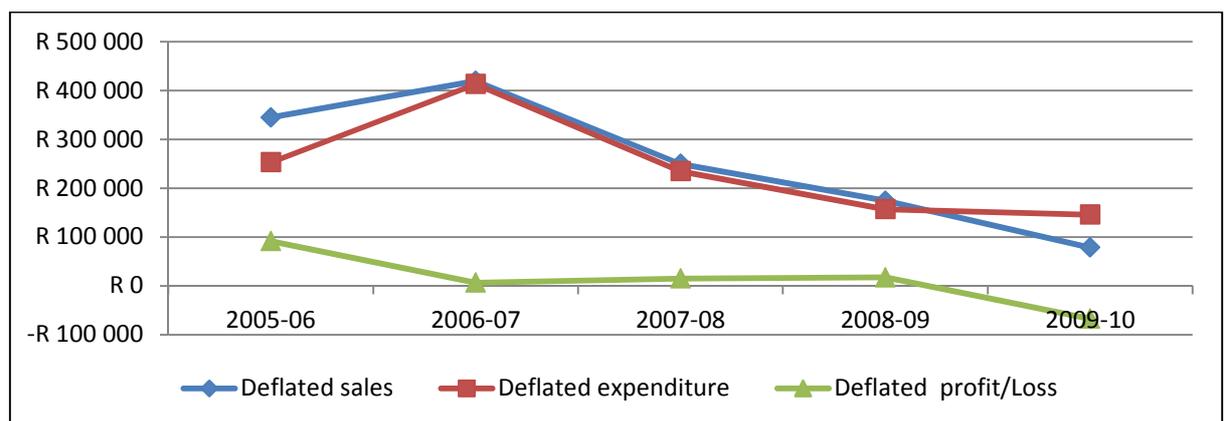


Figure 6.2: Deflated sales, expenditure and profit/loss for the Nieuwoudtville bulb project.

From the data received, it would appear that the Nieuwoudtville project has not been profitable. This contradicts the view of the Departmental project manager, expressed in 2010. The lack of verifiable data, and the failure by the NCPDA to provide the audited data for the project, entails that our data, and subsequent results are almost certainly inaccurate.

6.4: PROJECTIONS FOR A FUTURE SCENARIO

Projecting a future cost-benefit analysis for Lachenalia entails a request from ARC-VOPI in July 2011, when the draft impact assessment report was presented. At this stage it has already been established that cash flows for VOPI were close to positive, which was surprising, whilst cash flows for Nieuwoudtville, were not positive, which was also surprising, but could be due to a lack of adequate data. A key concern was that the current model is inherently monopolistic and needs to be expanded. At this stage it is also clear that the Lachenalia technology that has been the subject of extensive public funding (through the ARC and the NCPDA) has thus far resulted in the establishment of one propagator, one grower and one buyer, which is highly concerning. Hence a viable model for commercialisation is investigated.

Two actors dealing with Lachenalia were consulted, in order to learn from them regarding the feasibility of a new model; whether the Lachenalia market has the potential for sustainable profits. Ms Fransie Hancke, the owner of Afriflowers and M. Stuart Barnhoorn the Managing Director of Hadeco were interviewed. Hadeco occupies 80-90% of the bulb market in South Africa. Ms Hancke has been in Lachenalia business for the past thirteen years, while Mr Barnhoorn has been involved in the flower industry for nearly three decades.

Both were pessimistic regarding the growth potential of Lachenalia and the introduction of new players in the value chain, in contradiction with the study by Wageningen University. Ms Hancke felt that more players into the value chain might destroy the current market through suppression of prices. Her own business plan for commercialization of six new cultivars, projects an estimate of 1.1 million market size bulbs by 2017, which she calculated would bring the ARC earnings of R92 100 in terms of mother material sold. Mr Barnhoorn also expressed concern about attempts to expand the Lachenalia market. He pointed out that Hadeco's decision in 1982 to hand over all breeding stock to the ARC was informed by the view that the production costs for Lachenalia were unsustainable. Currently Hadeco sells between 30 000 and 125 000 Lachenalia bulbs per annum (a 0.3% share of the local floriculture industry) in South Africa and sometimes export roughly 40 000 bulbs to New Zealand. His concern is the cost price of Lachenalia bulbs. A price of R3.25 per pot of 3 bulbs is obtained during good years, decreasing to R1.12 per pot during bad years. According to Mr Barnhoorn attempts to expand the Lachenalia market is a waste of resources as operational costs at Nieuwoudtville, Afriflowers and VOPI indicate that the costs of producing Lachenalia is too high, and that it would be difficult to raise prices locally, as he did not think the market will pay more.

The point of view that expanding the market and increasing competition would be inefficient contradicts economic theory and experience with most commodities. What is of course critical, is to ensure demand for the product through targeted and focused marketing of the unique attributes of Lachenalia, an issue that was dealt with in depth during the market study. It should be noted that the local stakeholders interviewed are part of the current value chain, with vested interest. This view is also based on the narrow chain currently in operation, where one buyer controls the whole value chain.

Initially the inclusion of three more growers was contemplated, expanding sales from the current 500 000 bulbs per annum to 4 million bulbs per annum over four years. However, a Dutch grower

consulted cautioned that the envisaged targets are too optimistic in the light of the current economic situation in Europe, and that the Lachenalia market should be expanded gradually whilst conducting a marketing campaign. Projected sales targets should therefore be adjusted to 2 million marketable bulbs over five years (figure 6.3). Since the Nieuwoudtville project had capacity to produce 1 million bulbs, this project should be able to grow its production to roughly 800 000 bulbs per annum, growing at a rate of 12% (60 000 bulbs per year) over 5 years. A new project could be empowered, through a full incubation process facilitated by the commercialisation programme of the ARC to produce 200 000 bulbs in the first year, gradually increasing this target.

The proposed business model entails that ARC-VOPI supplies disease-free tissue culture material to two multipliers, one being Afriflowers. These would provide bulbils to two growers, one being the Nieuwoudtville community, empowered to produce market ready bulbs for the European market. The preference would be to identify another community within the Namaqualand area. It will also be important to attract multiple buyers (both local and overseas) to achieve open and free access to Lachenalia bulbs from various production units within South Africa.

The model is schematically presented in figure 6.3, with potentially more growers when the model has proven successful. Royalties would be administered in South Africa either at the ARC 'farm-gate', or at the growers 'farm-gate'. The ideal point for collection of royalties will depend on what would be the most transparent option, accounting for actual numbers sold, the price charged and the amount of income generated, ensuring fair compensation for ARC services whilst not prejudicing other actors in the chain. While the royalties should ideally be administered and collected in South Africa, the most efficient way to implement might involve appointing an independent administrator. The suggested value is aimed at stimulating competition between various players, especially regarding sales and distribution of Lachenalia products. Competition could result in new actors (both multipliers and growers) to explore new markets with better opportunities (e.g. long-term contracts and/or premium prices).

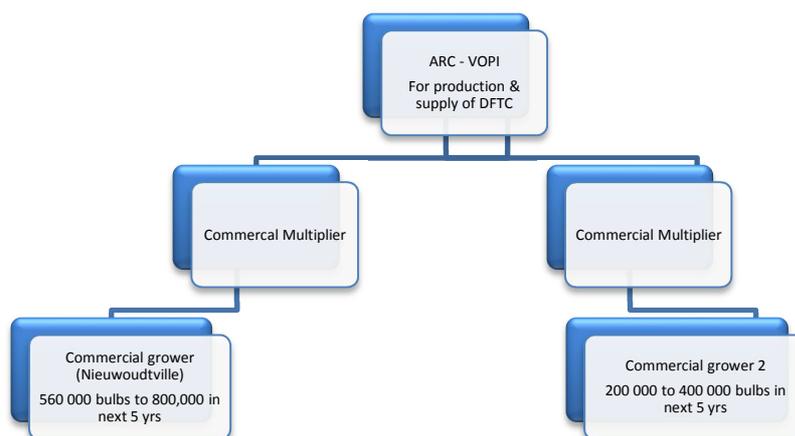


Figure 6.3: Proposed Lachenalia value chain comprising various actors in an open market

Using this suggested model an expanded scenario was analysed. Calculations to establish costs and income for VOPI, based on this hypothesised expanded value-chain with more actors, provided interesting results. In this model the administration of royalty income is also changed, with more

effective control measures to ensure a seamless and transparent process for collection and handling of royalties. Given an assumed annual cost increase of 5%, a royalty payment of €17.00 per 1000 bulbs, an exchange rate of R11 per euro, and sales of mother material to the value of R50 000 in year one growing to R200 000 in year four and five, the result of this analysis are provided in table 6.9. Included in these calculations are budgeted expenditure figures for personnel, infrastructure and overheads, marketing, variable operational costs and administrative costs.

Table 6.9: Projected budget for Lachenalia

	2012	2013	2014	2015	2016
Bulb Sold	1 000 000	1 750 000	2 500 000	3 250 000	4 000 000
Mother material sales	R 50 000	R 87 500	R 125 000	R 162 500	R 200 000
Royalties received	R 204 000	R 357 000	R 510 000	R 663 000	R 816 000
Total projected income	R 254 000	R 444 500	R 635 000	R 825 500	R 1 016 000
Personnel cost	R 320 250	R 336 263	R 353 076	R 370 729	R 389 266
Infrastructure & overhead costs	R 51 660	R 54 243	R 56 955	R 59 803	R 62 793
Marketing costs	R 105 000	R 110 250	R 115 763	R 121 551	R 127 628
Variable operational costs	R 50 400	R 52 920	R 55 566	R 58 344	R 61 262
Sub-total	R 527 310	R 553 676	R 581 359	R 610 427	R 640 949
Admin & management cost (15%)	R 83 051	R 87 204	R 91 564	R 96 142	R 100 949
Total Expenditure	R 610 361	R 640 879	R 672 923	R 706 570	R 741 898
Net profit or loss	-R 356 361	-R 196 379	-R 37 923	R 118 430	R 274 102

With two multipliers and two growers, the bulb sales targets set in this scenario are optimistic, and given the recent advice from the Dutch grower, should initially be halved, and adjusted according to demand. Most possible costs and income streams of the ARC were included in the calculations. Whilst the costs could appear steep, generally breeding programmes are very expensive. The ultimate goal of a public research organisation is not to be profitable in terms of offsetting R&D costs directly through income, but to deliver a technology that provides benefits to society and profits within the industry.

It is of limited importance if the cost of the ARC's Lachenalia R&D is offset by its sales of mother material and royalty income. Of critical importance is the viability of bulb growing projects and the eventual contribution of the Lachenalia industry to the livelihoods of beneficiaries and the profitability of entrepreneurs in the value chain.

Although specific calculations for such a scenario, would depend to some extent on local and initial establishment costs (which would most probably be financed through a development grant), an attempt was made to calculate potential profitability. Cost items were included, based on the Nieuwoudtville example (see table 6.10).

From the table it would appear that a community based Lachenalia bulb production project could in the long term be financially viable. Hence, there appears to be justification for further investments into Lachenalia commercialization programme.

Table 6.10: Lachenalia Enterprise Budget: Cash flow for new project

	Year 1	Year 2	Year 3	Year 4	Year 5
Expenditure Items					
INITIAL CAPITAL INVESTMENT: GRANT					
Production target (17.5% growth p.a)	500 000	587 500	690 312	811 117	1 000 000
Bulbils stock for (30% extra)	650 000	763 750	897 405	1 054 452	1 300 000
Cost for bulbils (20 cents)	130 000	152 750	179 481	210 890	260 000
30 labourers for years 1-3, 40 for years 4-5 @ R75/day x 20 days/month x 6 months/year [minimum wage]:					
Labour cost	270 000	270 000	270 000	360 000	360 000
Salaries for 3 supervisors @ R100/day x 20 days x 12 months:					
Salaries of 3 supervisors	72 000	72 000	72 000	72 000	72 000
Input cost (fertilizer, chemicals)/annum	15 000	15 000	17 000	18 000	19 000
Electricity (R1000pm)	12 000	12 000	12 000	12 000	12 000
Telephone	6 000	6 000	6 000	6 000	6 000
Rates & taxes (land)/annum	1 000	1 000	1 000	1 000	1 000
Infrastructure maintenance	2 000	2 000	2 000	2 000	2 000
Financial charges	3 000	3 000	3 000	3 000	3 000
Transport	10 000	10 000	10 000	10 000	10 000
Marketing & administrative costs	20 000	20 000	20 000	20 000	20 000
Sub-Total	541 000	563 750	592 481	714 890	765 000
Income Streams (@ R1.25 per bulb)					
Target bulb sales	500 000	587 500	690 312	811 117	1 000 000
90% sales (allowing for 10% damage, losses)	450 000	528 750	621 280	730 005	900 000
Income (sales of bulbs)	562 500	660 937	776 600	912 506	1 125 000
Income from tourist activity	12 000	12 000	12 000	12 000	12 000
Gross Income	574 500	672 937	788 600	924 506	1 137 000
Profit/Loss	33 500	109 187	196 119	209 616	372 000

No thorough economic analysis has been done regarding the potential profit of a commercial grower similar to the Nieuwoudtville project, but the limited information obtained would indicate that given the potential demand, a dedicated marketing campaign, a thorough effort at empowering the Nieuwoudtville and an additional group through an incubation process, there is scope for exploitation of Lachenalia through an expanded value chain.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

Flowers are grown, marketed and bought in more than 80 countries globally and the annual global flower trade has a value of more than \$40 billion. The value of pot plants exports is increased at twice the rate of that of cut flowers, with the top three export countries responsible for roughly two thirds of exports are located in Western Europe; a key market for Lachenalia. The South African floriculture industry has much growth potential and is lagging behind in terms of its capacity. The total value of SA's flower bulbs and tubers exports in 2010 was R46 million.

The Lachenalia R&D and commercialization programme spans more than 45 years, and has resulted in a high quality product with global marketing potential. Outstanding results achieved under difficult conditions include quality hybrids, a gene bank, production of disease-free tissue material; sound cultivation guidelines and a vast number of academic achievements. Still, the considerable public investment in Lachenalia resulted in few beneficiaries thus far. Commercialisation efforts were limited by gaps in funding; virus susceptibility; the long process required to establish viable bulbs and a complex cultivation process. The Nieuwoudtville flower bulb project was initiated by the ARC. Today this fact is hardly recognised. Whilst the aim was empowerment, this has not happened yet. The current beneficiaries are effectively casual labourers. This publicly funded project managed by the NCPDA was not open to financial evaluation during 2010.

A single European buyer, Mr van der Vossen is in full control of the Lachenalia value chain; from his initial request to the propagator for a specific number of bulbs, to the decision on how many bulbs to export to the Netherlands. The business model is monopolistic, anti-competitive, restrictive and exclusive; effectively barring new entrants. This poses a severe risk to the ARC, as a public entity mandated to support growth in the sector. Remedial steps are required to avoid legal ramifications of the Competition Act of 1998. Mr van der Vossen is the only authority on the price to be paid, the limited local sales and the eventual royalties paid, on what he declares as successful sales. He buys bulbs in October and grows them during the Dutch winter at his nursery, to be sold in the European Spring all over Western Europe. He developed synchronised growing which ensures that bulbs grow evenly, with even flowering, which he views as his trade secret.

Lachenalia will reach its significant potential if properly promoted. Currently its cost price is relatively high due to the measures required to deal with synchronised development and possibly countering virus infection. This is an area of contention as the ARC and propagator maintain that viruses are no longer a problem, whilst the buyer and NCPDA representative blame it for low sales.

The study found that there was particular potential for Lachenalia to be marketed as a quality, high value product. According to research done before the economic crisis, there is a market for more than 20 million Lachenalia bulbs in Western Europe, where the demand for pot plants and the amount spent on such pots is increasing. Whilst the current economic downturn in Europe probably decreased this market significantly, there is still extensive room for growth in the long term. Lachenalia can attract entrepreneurs from disadvantaged communities in South Africa and can provide employment in areas with limited job opportunities. Growers agree that if value is added to

the pot, its value is increased substantially. Lachenalia's competitive advantage has not nearly been fully exploited thus far.

Sound cultivation guidelines have been established and many lessons have been learnt from the Nieuwoudtville community project and other commercialisation attempts. The current value chain does however present a severe risk to the ARC. Other threats include that the process for synchronised development in Northern Hemisphere is not known here and if the value chain is to be expanded and more growers in Europe are to be engaged, this process should be documented. What appears to be maladministration by the NCPDA at Nieuwoudtville in terms of procurement and pricing mechanisms, the lack of empowerment and the exclusive trading with the Dutch buyer, is questionable in terms of the competition act. The fact that the current buyer provided contradicting, evasive information and threatens to withdraw should bulbs be sold to others is problematic.

7.2 RECOMMENDATIONS:

Lachenalia is a unique, highly attractive, quality product, with good colour variety and a long pot life. An additional advantage is that Lachenalia is relatively unknown, a characteristic which draws consumers, who would further be sensitive to the fact that Lachenalia is produced as part of community development and has a history of more than 45 years. Lachenalia has won a variety of prizes on international flower fairs and in magazines. Limited exposure of Lachenalia is not due to a lack of unique attributes, but a result of limited promotion. This is a crucial issue to be addressed in commercialisation efforts. Extensive local and global flower bulb networks and linkages must be mobilised to market Lachenalia. Specifically the gift market has a significant growth potential in Europe alone. Florists and garden centres as high quality outlets are the most attractive distribution channels in Western Europe for Lachenalia.

A proposed business model entails that ARC-VOPI keeps its primary function of supplying disease-free tissue culture material. Two multipliers are to be established, including the current propagator Afriflowers, to produce bulbils. Two growers, including the current Nieuwoudtville community need to be empowered. Target bulb sales could be gradually increased, according to demand. New actors should be introduced in phases.

A dedicated training programme should be developed for Lachenalia producers; empowering groups in Namaqualand to produce market ready bulbs for the market. The preference would be to identify another community in the North-Western Cape area, to align with the strategic direction of the ARC, in empowering new entrants into the sector. It will also be important to attract multiple buyers (both local and overseas) to achieve open and free access to Lachenalia bulbs from production units in SA. Royalties should be administered here, by an independent administrator. The ARC should also investigate partnerships with public entities such as the DTI and NAMC to intensify commercialisation. It is advisable that Lachenalia is sold specifically as a South African product, grown by communities in the Namaqualand, as part of local development.

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Annexure A: TERMS OF REFERENCE: *LACHENALIA* IMPACT ASSESSMENT.

1. Background:

Lachenalia, a bulb flower species, was identified as a potential commercial crop by the ARC in the late 1960s. The ARC's *Lachenalia* collection consists of 560 accessions of 70 species. Accessions of the same species, collected at different localities, are conserved separately in order to retain genetic variation within the species and genus. The *Lachenalia* breeding programme extensively exploits this collection and a variety of hybrids are now available. The ARC is the owner of all these *Lachenalia* varieties.

The flower market in SA has a turnover of R600 000 to R700 million p.a. This constitutes less than 1% of the value of the global flower industry. The well-known *Freesia*, *Zantedeschia* and *Gerbera* lines that originated in SA are typically traded in transactions worth in excess of €4 million per week on Dutch auctions. However, these cultivars were developed abroad, with little direct benefit to SA. *Lachenalia* is one of only a few locally bred flower varieties.

Production system

The production system consists of three phases, done by three types of commercial growers. During the 1st phase the propagator multiplies mother material through leaf cuttings (utilizing tissue culture plants from the ARC as starting material). This phase to multiply viable bulblets takes at least four years. During the 2nd phase, a bulb grower grows the small bulblets obtained from the propagator to a marketable size. During the 3rd phase the pot plant grower plants the dry bulbs in pots and sells the potted plants to the end-user. Currently the propagators and bulb producers are South African, with one major pot plant grower in the Netherlands and a few minor growers in SA. The producer in the Netherlands currently acts as sole exporting agent. Hadeco distributes bulbs in the local market and several local growers produce pot plants, including Afriflowers (Gauteng), New Plant Nursery (Western Cape) and Dee De Souza (KwaZulu Natal). Today, the ARC only supplies mother material for multiplication.

Commercialization efforts

Since the mid 1980's the ARC has been engaged in a process of commercialization of *Lachenalia* lines. Propagation material was provided to local and Dutch growers, but because cultivation practices were ill defined, success was limited. Since the mid 1990's the ARC increased its commercialization efforts, supporting growers by developing production guidelines and ensuring the supply of disease free propagation material. The result was significant improvement in production. A royalty administration agent (RAI) and an exclusive distribution agent were appointed to handle the royalty administration and distribution in all countries excluding SA. Ten varieties were protected by plant breeder's rights in the Netherlands and a trade

name "Cape Hyacinth" was registered. Today, the distribution agent is no longer required and the trade name is no longer used.

Community development

As part of developing production systems, the *Lachenalia* programme was expanded into a community development initiative; growing bulblets into marketable bulbs. The ARC in collaboration with the Northern Cape Department of Agriculture initiated a bulb production project in Nieuwoudtville. This project constitutes the 2nd phase of the production system described above: The community was linked to a commercial grower who supplies them with bulblets. The community grows these to a marketable size, which are subsequently exported (through the sole Dutch buyer) to the Netherlands where they are planted in pots and sold throughout Europe. The project has become a landmark and produces 200 000 - 500 000 bulbs p.a. It grew from a small pilot project in 1997 to a viable concern that provides work for 5 permanent and 40 temporary workers. Analysis of the viability and potential expansion of this project will be a priority of this investigation.

Current marketing efforts

In 1997, 20 000 bulbs were sold locally. *Lachenalia* was marketed in Europe for the first time in 1998, doing specifically well in the Netherlands, the world's capital flower market. Roughly 150 000 bulbs were exported in 1998; 350 000 in 2000 and 2 million by 2002. Drastic declines mainly due to limited promotion led to current sales of ± 500 000 bulbs p.a.

A market study that was conducted in the late 80's estimates the potential market for *Lachenalia* in Europe at 20 million bulbs p.a. During 2000-2004, flower bulbs export globally grew by 27%, indicating significant commercialization potential. South Africa with its huge plant variety currently only occupies 0.8% of the global flower market (Boshof, 2007). Hence, on face value, flower bulbs have significant potential in terms of local job creation and foreign revenue. However, bottlenecks that limit large scale sales include the time required to multiply and grow sizable bulbs for sale, and *Lachenalia*'s relative unknown status. It takes up to 10 years for a new variety to be established in the market, a process that can be fast tracked to an extent by active marketing. Increasing visibility, with supply of relevant information is crucial. Due to the small amounts of bulbs sold currently, royalty income to the ARC is low, posing the question if the breeding programme makes economic sense.

On the positive side, extensive international interest has been expressed in discussions between ARC breeders and growers in the USA, Italy, Germany, Poland (where initial trials were completed), and yet unexplored markets such as the East, Israel, Denmark and Portugal. The ARC has extensive expertise in breeding and production technology, access to genetic resources, developed sound production systems to ensure quality material and has successfully initiated a community based production project.

2. Institutional framework

2.1 Organisations involved in *Lachenalia* development, propagation and marketing:

- The ARC conducting technology development & commercialization
- Propagators doing multiplication
- The Nieuwoudtville community producing viable bulbs
- Other local bulb producers producing viable bulbs (limited)
- Local buyers that deal in retail of either bulbs or pot plants)
- International buyers selling bulbs or pot plants
- End users buying pot plant or bulbs

2.2 Proposed Investigation team: ARC, WUR, NAMC:

An inter-institutional group of three organizations will collaborate in this study. The ARC's Economic Services unit approached the WUR in the Netherlands and the National Agricultural Marketing Council, to collaborate with us in this Impact Analysis. These two organisations could contribute substantially to an ARC driven impact assessment. Involving WUR can be viewed as a logical progression as a considerable part of the work has to be conducted in the Netherlands. This will also keep the cost of the IA within the limited budget. The NAMC is a strategic partner of the ARC and this venture provides an opportunity to develop a partnership. Association with these partners provides additional benefits in that it would strengthen the Economics unit and will enhance the quality of the assessment. Collaboration with sources of knowledge outside of the ARC through this type of networking is encouraged in ARC policy.

3. Period: January – July 2009

During the 1st three months a local IA will be conducted; focusing on an ex post scenario analysis. This will include an evaluation of the efforts of the ARC thus far in terms of cultivar development, production, multiplication and commercialization efforts. A specific focus on the Nieuwoudtville community will take place. During the 2nd 3 months, an international focus is foreseen; analysing an ex ante scenario; determining the viability of the *Lachenalia* project in the future, exploring markets and further commercialization. The international ex ante study will form part of an MSc study at Wageningen University in the Netherlands.

4. Justification

The *Lachenalia* project is acknowledged as a successful initiative of the ARC. The breeding programme has evolved to a stage where the ARC provides mother material to local propagators, bulblets are passed on to bulb growers, and bulbs are sold or cultivated into pot plants and then sold, both locally and in Europe. Commercial benefits have been achieved and the project in Nieuwoudtville contributes to livelihoods in the area. The product has proven significant market potential. However, the amount that the ARC receives in terms of royalty income does not seem to justify the breeding programme. The extent of commercial and livelihood benefits needs to

be determined, both locally and globally. In addition, the supply potential, especially in terms of community development initiatives needs to be established.

Understanding the *Lachenalia* production chain could however yield lucrative results for the ARC and the country. Important lessons are to be learnt for the programme, and the processes used in its development. The programme, if significant export potential is found, could contribute to agricultural growth and increased foreign exchange earnings. In addition, improvement of the market share has significant spinoff potential in terms of community and livelihood development. It would also increase understanding within the ARC regarding world markets, especially for ornamental plants. This programme addresses three of the ARC's strategic objectives, warranting a thorough IA.

A highly efficient study is expected, given the fact that a key part of the investigation can be done in collaboration with expert partners, limiting the direct research costs for the ARC. A legal agreement that protects the ARC's IP will be put in place through contracts between the ARC, NAMC and the WUR. The particulars of the analysis will be negotiated between the VOPI, the assigned agricultural economist and the partners.

5. Objectives of the evaluation

- 5.1 Determine the impact of the *Lachenalia* programme since inception until now (ex post impact assessment)
- 5.2 Determine programme viability in terms of continued ARC research and commercialisation

Focus of this *ex post* analysis will be on the ARC's efforts in terms of the R&D; including commercialization efforts, with particular emphasis on the Nieuwoudtville community project: Was the investment by the ARC justified, and did it deliver a basket of technologies with significant economic value. A comprehensive assessment including social, economic and environmental impact is envisaged. The second major component of the IA will be *ex ante* evaluation of the *Lachenalia* programme in terms of commercialization: Would further investment in the *Lachenalia* programme be justified, and what would the expected rate of return to the ARC be.

The analysis will:

- Determine the potential for proliferation of the project to other communities
- Investigate and describe all segments of the *Lachenalia* value chain
- Establish the ARC's optimal role in each segment of the value chain
- Establish viable alternatives in terms of partner involvement in the value chain
- Profile the optimal IP (e.g. royalties) regime for *Lachenalia* and determine its costs
- Determine the Internal Rate of Return (IRR)
- Determine the Rate of Return (RoR) on past ARC R&D investment.

- Propose a possible refocus of the *Lachenalia* programme, if required
- Establish *Lachenalia*'s commercialization potential both locally and abroad
- Develop a promotion and marketing strategy

6. Output from the evaluation

A report with clear recommendations for the future of the ARC's *Lachenalia* programme

7. Project process

Following signing of MoUs between the Economic Services unit and VOPI, WUR and NAMC respectively, the study, to be coordinated by Mr Joseph Kau will commence. The WUR student will focus on international marketing potential in the Netherlands and Europe, but will also assist in local analysis. NAMC will collaborate in *ex post* and *ex ante* assessment. Monthly meetings will be held between parties, with the Dutch partner joining via teleconference, when required.

8. Budget

Item	Estimated cost (R)
Local trips (3 of 5 days for 2 people @ R8000 return, incl. flights – R2500 & car hire R185p day + 2400 for kilometres)	24 975
Accommodation (2 people x 15 nights @ R200)	6 000
Subsistence (2 people x 15 days @ R135)	4 050
WUR Cooperation*	29 425
Total	64 450

**ABRIDGED QUESTIONNAIRES:
NIEUWOUDTVILLE PROJECT WORKERS**

SECTION A: BACKGROUND INFORMATION FOR MEMBER PARTICIPATION

A.1 When did you join the Bulb production Project?

A.2 What was the reason for joining the project?

A.3 How did you occupy yourself before joining the bulb production project?

A.4 Do you think you are benefiting from the Bulb Production project, please motivate your answer?

A.5 Did you participate in any agricultural project before the flower bulb project, if Yes please give details?

A.6 In terms of the answer provided in A.5, how does participation in the project impact on you?

A.7 How long do you want to participate in this project?

A.8 What are the three main factors or conditions that will make you stay long in the project?

A.9 What are the three main factors or conditions that will make you quit the project?

SECTION B: CULTIVATION PRACTICES

B.1 Do you produce more than one type of bulb in your project; if so, may you please mention the names of the bulbs you produce?

B.2 We understand that, there are other bulbs other than Lachenalia, that you are currently producing, how does Lachenalia compares with these bulbs

B.3 If you were asked to drop some bulbs and continue producing only one, which one would you continue to produce and why?

B.4 In case Lachenalia is not chosen, please asks the respondent to describe how Lachenalia compares with the features or reasons he/she advanced for the choice made in B.3 above?

B.5 Do you apply fertilizer in your project?

B.6 If yes, which fertilizer do you use?

B.7 what impact does usage of fertilizer have on your crops?

B.8 Do you use chemicals or pesticides on your project, and if so for what purpose?

B.9 What impact does usage of chemicals or pesticides have on your crop?

B.10 Has there even been negative experiences on the project, as a result of usage of fertilizer or pesticides, if Yes please elaborate?

C.1 May you please tell us how many people are under your roof?

C.2 Of the people mentioned in C.1 above, how many are employed and how many are having businesses?

- C.3 How many of the people in your household are receiving social grants?***
- C.4 Do any of the people in the household other than you contribute financially, if so please provide details?***
- C.5 How are living expenses such as food, electricity bills, and education fees shared among members in your household, who pays for what?***
- C.6 In the past three years or so, what income did you receive?***
- C.7 How much are you paid in the bulb production project?***
- C.8 May you please provide a breakdown of how you spend the money from the project?***
- C.9 How has your participation in the project impacted on your relationship and interaction with people in your household, e.g. do they miss you, because you are not home anymore?***
- C. 10 In the past three years did you buy any new asset in your home?***
- C.11 If answer to C.10 above is yes, please use table below to probe:***
- C.12 In the past three years did you make any improvements to your home, if yes please provide details?***
- C.13 In case the answer in C.12 above is yes, what was the value of improvements made?***
- C.14 In the past three years did you fund anybody's education?***
- C.15 In case the answer in C.14 above is yes, how much was spent on education?***
- C.16 Please revisit C.8 to C15 to see if the cost of all expenditures corresponds with the beneficiary's income from the project and from other sources, and if expenditures are more, please ask the beneficiary where did he/she receive other funds?***
- C.17 What is your overall impression regarding the project, did it make life easier or more difficult for you, please elaborate your answer?***
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- C.18 What are the things that you do not like about the project, for which you would like to see improvements?***

QUESTIONNAIRE FOR NORTHERN CAPE PROVINCIAL DEPARTMENT OF AGRICULTURE

A.1 Please tell us why the Department decided to establish the Nieuwoudtville Bulb Production project, what were its objectives?

A.2 Is bulb production the best way to do this – is there not something else that has more potential for achieving these objectives?

A.3 In the beginning of the project there were a number of stakeholders involved (e.g. Nieuwoudtville Local Development Forum (LDF), IDT, RDP office, Northern Cape Provincial Cabinet, etc.) Please tell us what was the role of each stakeholder in the project was?

A.4 Are the abovementioned stakeholders still part of the project?

A.5 If answer to A.4 above is yes, what is the current role of these stakeholders?

A.6 Who have sponsored or paid for initial expenses for the establishment of the project?

A.7 How much money was invested in the establishment of the project?

A.8 Do you know what the costs were for establishing this project?

A.9 would there be a record (project report, financial report, etc., that would describe these costs?

A.10 Other than establishment of the project what has been the other roles of the department in the project?

A.11 Who owns the project?

A.12 Is there a legal entity registered for the project, please provide details?

A.13 We understand the Department is also running the administration and financial management of the project. Please explain this arrangement?

A.14 Has there ever been challenges with regard to the model practiced by the department as in A.12 above? (what specifically are you asking?)

A.15 What are the legal implications for the Department running the management of the project, e.g. Tax, PFMA, labour relations act?

A.16 What are the positive things about the model in A.12 above?

A.17 How does the department account and report on the financials and non-financial performance of the project?

A.18 Who represents the department in the project, and how is the person compensated for his/her services?

A.19 How many times does the representative visit the project in a week?

A.20 Does the department have any plans to hand over the project to the beneficiaries, or any exit strategy, please provide details?

A.21 Does the department have other agricultural projects in Nieuwoudtville and or surrounding areas, and if so, how does Nieuwoudtville Bulb Production compare with other projects, in terms of performance?

B.1 Please tell us how you went about recruiting the participants into the project, were there any selection criteria?

B.2 How did beneficiaries know about the project?

B.3 On average how far do individuals stay from the farm?

B.4 How do beneficiaries travel to the farm on daily basis?

B.5 if there is transport used to carry beneficiaries to the farm, how is such transport paid and by whom?

C.1 Since establishment of the project in 1998, has productivity on the farm been increasing or decreasing?

C.2 What is current level of Productivity?

C.3 What are the post-harvest handling requirements for your produce?

C.4 In what form is the produce sold, graded, packaged or raw?

C.5 How many buyers are there for your produce?

C.6 Other than sales of bulbs, is there another way of generating income in the project?

C.7 We understand that Nieuwoudtville Town is a tourist attraction, how does this benefit the bulb production project? [this question could be asked to other people too]

C.8 How is marketing and sales of the produce done and by whom?

C.9 Is the department happy with current arrangements for sales & marketing, please provide details?

C.10 What is the gross income derived from the project, in the last three years?

C.11 How has the money as in C.8 above been used?

C.12 Does the department have a Bank Account for the project, if so, in whose name is the Bank account opened the Department's Name or the Project name?

C.13 In the past three years, has the department received a loan, credit, sponsorship or a donation for the project?

C.14 If the answer to C.13 above is yes, which institution provided the funds?

C.15 May you please provide us with the annual financial figures for the project:

C.15 Since establishment in 1997, and in particular; the current administration model in place, what are the lessons learnt on part of the Department?

C.16. What is the your personal impression regarding the future of the project, do you see the project growing or collapsing in the future, please provide details?

C.17 In your own opinion do you think the project can survive on its own without assistance from government?

C.18 If answer to C.17 above is no, what are the kinds of services and assistance does the project require from Government?

C.19 Are there any other future activities or programmes other than bulb production that are planned on the farm?

C.20 If answer to C.18 is yes, what are those plans and how are they going to be financed?

C. 21 Are there any other issues we did not cover in the questionnaire whom you think are important for this study or for the project itself?

ABRIDGED QUESTIONNAIRE FOR COMMERCIAL PROPAGATORS

A.1 As the most important commercial propagator of Lachenalia, what are your main objectives - what do you wish to achieve by propagating Lachenalia?

A.2 When did you become involved with the propagation of Lachenalia?

A.3 How do you obtain the disease-free planting material – can you explain the process?

A.4 Who were the stakeholders in the Lachenalia value chain prior to 1997 –what is the current status of their involvement as far as your knowledge goes? A.5 Are you satisfied with the service from the ARC as the suppliers of the disease free tissue material, or what are the challenges?

A.6 If the ARC were to shut down the Lachenalia breeding programme, how will this impact on your business?

A.7 What is the current cost of the disease free tissue material?

A.8 What did you paid for this material since 1997 – and how much material you obtained for these years?

A.9 Could you (in brief) describe the process you follow for propagation of Lachenalia – also explaining the time it takes before you can sell bulblets?

A.10 Can you provide an indications of the numbers of bulblets sold over the past 5 years (production and price per annum)?

A.11 Would you prefer the current volumes of bulblets produced, or would you prefer to produce more/less? Why?

A.12 Who buys bulblets from you and at what quantities?

A.13 Are you happy with the current price you receive for the bulblets and if not what are the challenges?

A.14 The records mention a company called Langberg which was actively involved in propagation of Lachenalia –are you aware of this company and was there any relationship between your company and that of Langberg? Were/are you competitors?

A.15 Can you describe the value chain for Lachenalia in SA to us?

A.16. How does information flow between your company and other stakeholders in the value chain?

A.17 If there was anything to be improved with regard to the value chain of Lachenalia what would that be?

A.18 Are there any crucial matters not discussed in this interview which you would like to mention?

QUESTIONNAIRE FOR VOPI

- 1 ***Having started in the 1960's, the breeding programme for Lachenalia has evolved over time, with changing themes. Kindly provide a synopsis of this history in terms of changes in the breeding programme and the focus on commercialization since the late 1990s***
 - 2 ***Please provide an annual budget figure (e.g. labour cost, lab costs, quarantine programmes etc.) of the breeding programme for Lachenalia since inception (or from the time this data is available). If detail per item is available, that would be appreciated.***
 - 3 ***How does the breeding programme of Lachenalia compare with those for other ornamentals (in terms of e.g. labour requirements, costs, etc.)?***
 - 4 ***While initially the programme was funded solely through PG, what funding changes took place - please describe?***
 - 5 ***Are you happy with the current funding, if not what are the challenges?***
 - 6 ***How many varieties are currently produced and what is in the pipeline?***
 - 7 ***How is sales income generated – what is sold to whom at what price?***
 - 8 ***What are the current aspects of the Lachenalia programme that require funding – and how much (please include germ plasm collection maintenance)***
 - 9 ***The companies Hadeco and Multiflora are key players in the flower trade – has the ARC dealt with them directly to market Lachenalia? If so, please elaborate***
 - 10 ***Are there existing supply contracts for disease-free tissue material?***
-
- 11 ***How is pricing for the disease free tissue material determined and by whom?***
 - 12 ***Please explain the royalty administration process for Lachenalia***
 - 13 ***In the past Langberg, RAI Holland and Hobabo were apparently involved in licensing and royalty administration – what is the status quo?***
 - 14 ***In the past five years what has been the annual income derived from royalties?***
 - 15 ***Are the costs of royalties and mother material sold based on market intelligence relating to Lachenalia trade, or how are prices determined?***
 - 16 ***What is the relationship between Mr Van Der Vossen and VOPI?***
 - 17 ***Please provide the annual financial figures for the following activities since 1997***
 - 18 ***Are there any other issues that you think are necessary for the team to know?***