

**New and Interrelated Facets of Land Acquisition: The Case of the
Chinese Investments in South Africa**

By

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DECLARATION

I, Angela Elizabeth Fraser, declare that this dissertation/thesis, which I hereby submit for the degree MInstAgrar Environmental Management at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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SUMMARY

This research aimed contribute to the understanding of investments directed to agriculture and land by investigating three new and interrelated facets related to land acquisitions, based on the China South Africa Agricultural Demonstration Centre as a case study. These new and interrelated facets are: i) land acquisitions are increasingly occurring in order to gain access to other natural resources rather than purely the land itself, ii) land deals are increasingly ‘invisible’ and iii) land acquisitions are increasingly occurring in developed and emerging economies. This research confirmed the increasingly ‘invisible’ nature of land deals as they often include a production control element (not making it necessary to acquire the land and/or other resources directly). It also showed that developing and emerging economies are becoming ever more targeted as these countries present more secure investment environments (land security, respect of property rights) and can act as stepping stones into other countries and sectors. Finally, although the hypothesis regarding natural resources could not be confirmed, the mandates of demonstration centres need to be critically assessed to determine whether the project objectives act as a disguise for a natural resource grab. Taking these facets into account, the current land acquisition definition is potentially too limited. China’s (and other investors’) engagement in African agriculture is a multi-faceted rapidly evolving phenomenon, involving a complex array of actors, which cannot be represented by a single strategy. Ultimately it is dependent on the Chinese aid recipient countries, like South Africa, to negotiate foreign direct investment into agriculture (and other sectors) and to shape and remodel the engagement into agricultural development, in order to benefit the local communities and minimise the environmental and social impacts thereof.

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List of Acronyms:

BRICS	Brazil, Russia, India, China, South Africa
CNADC	China National Agricultural Development Centre
CAIDCO	China Agriculture International Development Co Ltd
DAFF	Department of Agriculture, Forestry and Fisheries
FSDARD	Free State Department of Agriculture and Rural Development
FSDEAET	Free State Department of Economic Affairs, Environment and Tourism

CHAPTER 1

Introduction

Setting the scene and introducing the new facets of large scale land acquisition

Lands, which previously seemed of little interest to the global community, are presently being bought up at an ever-increasing rate. South Africa is also presently being affected by a renewed wave of foreign direct investments, in particular by Chinese investments. This renewed wave warrants studies analysing land acquisitions, taking other natural resources and political geographies of the world into account, providing a broader and more systematic approach to land acquisition.

This chapter will briefly consider the current global land acquisition phenomenon from the extent of acquisitions globally, the drivers of land acquisition, the issue of rights granted in land deals and the renewed strategies of acquirers. Within this overview three new and interrelated facets of land acquisition are posed. The chapter then takes a look at the aims and objectives of the research project, hypothesis, limitations and delimitations, terms and definitions and motivation for the study. Finally the chapter gives a brief overview of the chapters which follow.

1.1 Background: the three new facets

The current global land acquisition phenomenon has attracted significant media attention over the past few years. To date, approximately 50.1 million hectares of land have been subject to agricultural land acquisitions (Anseeuw et al., 2012). The majority of which has occurred in Africa (Anseeuw et al., 2012); mainly due to the perceived abundance of ‘available’ land suitable for agriculture (Cotula et al., 2009).

This being said, it becomes clear that it is not a simple phenomenon. Firstly, it is multi-dimensional. The majority of acquisitions occur on higher-value lands, where there is greater availability of water, soils and access to markets (Cotula & Vermeulen, 2009). Secondly, it is rapidly changing. “There is no one grand land grab, but a series of changing contexts, emerging processes and forces, and contestations that are producing new conditions and facilitating shifts in both *de jure* and *de facto* land control”(Peluso & Lund, 2011, 669).

With this in mind, and confirming the above mentioned observations of complexity and change, this work finds itself at the crossroads of three new and interrelated facets related to land acquisition:

- Water and other natural resources are the primary vital assets obtained in land acquisitions
- There is a shift from ‘visible land deals’ to increasingly ‘invisible land deals’
- Emerging and developed economies are the new target of acquirers

1.1.1 The role of resources in land acquisition

The drivers of land acquisition include: population growth, growing consumption and the change in diets and lifestyles (Anseeuw et al., 2012; Cotula & Vermeulen, 2009). This in turn increases the demand for food, feed, timber and fuel (The World Bank, 2010). Coupled to these drivers, the increase in concern regarding the pressure on and exhaustion of natural resources and the related perception by investors to better control them from a commercial point of view has been cited as a considerable driver for acquisition (Cotula & Vermeulen, 2009; The World Bank, 2010).

A paper by the Food and Agricultural Organisation (2009) found that the current land acquisition trend is resource seeking, rather than market seeking, as in the past. In fact recent studies have highlighted resource scarcity as a driver of land acquisitions, particularly by emerging economies (de Fraiture et al., 2008; Mann & Smaller, 2010). As such, water is increasingly viewed as the main target of land acquisitions (Mehta et al., 2012; Transnational Institute, 2013). Malik (2011) similarly recognises that investors are increasingly seeking long term access to water rights. These acquirers usually face resource shortages, increasing food demands and environmental degradation (Jagerskog et al., 2012). Therefore, they need to look abroad to fulfil their resource needs through virtual trade. Virtual trade, trade and transfer of natural resources, like water, in the form of agricultural commodities (Allan, 2011), is expected to increase significantly in the future (Jagerskog et al., 2012).

The current literature on land acquisitions recognises the increasing role which natural resources, besides land, plays in land acquisitions. Despite this, the majority of the literature indicates that other natural resources play a secondary role in land acquisitions. This research should contribute to the debate that water and other natural resources are the primary vital assets obtained in land acquisitions.

1.1.2 Rights and production control grabbing in land acquisition

Rights, in particular land and water, are a prerequisite for land deals (Future Agricultures, 2011). The nature of the resource rights transferred and the parties in the transfer are a key concern (Cotula et al., 2009). This is due to the fact that the right to control natural resources and exclude or alienate, coupled with climate change and the predicted effects on natural resource availability, could lead to significant local and national conflicts (Huggins, 2011; Borras et al., 2012). Land acquisitions can be positive, however investing in and controlling strategic natural resources for foreign benefit could be harmful. The economic equilibrium of land deals is dependent on the cost of transferring rights versus benefits obtained, to host countries (Cotula & Vermeulen, 2009).

Land acquisitions can be viewed as control grabbing when considering the political economy perspective. Control grabbing entails obtaining access to and control over vital resources, like land and water. This gives acquirers the direct ability to control the nature and direction of the benefits gained through the use of the resources (Transnational Institute, 2013). However, beyond the acquisition of the land itself, there is a renewed interest to control land-based activities. There is a shift away from purely land acquisitions which are ‘visible’ to increasingly ‘invisible’ land-related deals (Anseeuw, 2013 a). In the first instance, typically referred to large scale land acquisitions, the aim is to obtain natural resources, particularly land (Anseeuw & Ducastel, 2013)¹. These acquisitions have been the focus of scientific analyses to date (Anseeuw et al., 2012; Cotula & Vermeulen, 2009; The World Bank, 2010). Beyond large scale land acquisitions, which as Anseeuw and Ducastel (2013, p2) write, represents “the tip of the iceberg in terms of wider land-related and agrarian dynamics”; a second category was distinguished where dominant actors control land-related activities.

Ensuring control over the value-chain includes the development of production control mechanisms, such as investments in equity of production entities as well as strengthened vertical integration of the production cycle through acquisitions of shares in the different segments (Anseeuw, 2013 a; Swinnen & Maertens, 2007). The integration entails control over upstream, financing, and downstream, processing and distribution, production activities, thereby increasing control over the entire production cycle (Anseeuw & Ducastel, 2013). Control over land and natural resources is increasingly becoming a strategic asset for

¹ Land is acquired for agriculture, focusing on primary production activities, and ecosystem purposes (Anseeuw & Ducastel, 2013).

companies wanting to influence negotiating power along entire value-chains (Cotula, 2012). These acquisitions are ‘invisible’, but have significant agrarian consequences (Anseeuw & Ducastel, 2013).

1.1.3 Changing targets for land acquisition

As initially stated by the World Bank (2010) low-income countries with weak land and resource rights governance, abundant land and low productivity have been the subject of acquisitions. Land in these countries is often undervalued and under-utilised (Future Agricultures, 2011), state capacity is weak and often property rights are ill-defined (The World Bank, 2010), making it easier for investors to justify new investments and acquire huge fields of land.

On the other hand, acquirers are instead increasingly turning their attention to emerging economies and industrialised developed countries, such as Australia, Canada and France. These economies are seen as a stable investment. This change in targets for land acquisition could be a sign of a change in strategy by the acquirers into countries where land deals are more likely to succeed.

1.2 Aims and Objectives

These facets bring several questions to the fore. Can we speak about “land grabbing” when land is not a priority, where other natural resources become more important than land itself? Can we still talk about “land grabbing” if the practice is not directly focusing on land control, but targets production processes? Can we still talk about “land grabbing” if emerging and developed countries are being targeted, where land transactions and investments are within a liberal economy and property rights are established and secure?

In order to address these questions, we need to better understand these renewed facets and the questions surrounding the implications of these facets. This is not yet adequately covered in the literature, as the phenomenon is rapidly changing.

The aim of this research project is to analyse new and interrelated facets relating to land acquisition, with a focus on South Africa. Indeed, although until recently South Africa was not affected or at least very little attention was focused on it, it has recently seen a couple of agricultural investment projects mushrooming, engaging non familiar actors. One of these case studies will be analysed, namely the Chinese involvement in the establishment and upgrading of the South Africa-China Agricultural Technology Demonstration Centre.

In order to achieve the aim of this research project several sub-objectives will be analysed. The three facets will be cross-analysed through the following four objectives:

- *The land project and land use:* To conduct an in-depth description of the land acquisition project
 - What is the location of the project?
 - What was the land use on the project site prior to the acquisition?
 - What is the land use on the project site after the acquisition?
 - What was being produced on the site prior to the project?
 - What is being produced under the project?
 - What was the quantity of the output on the project site prior to the acquisition?
 - What is the quantity of the output under the project?
 - What happened to the output prior to the acquisition?
 - What happens to the output after the acquisition?
 - To gain an understanding of the layout and facilities on the project site
- *Processes:* To determine the typical structure of the land deal and analyse the land acquisition processes in-depth
 - What was the land acquisition process/acquisition framework for the case study?
 - To determine the land ownership prior to and after the acquisition
 - To determine the governance structure of the project
 - Who financed the project, how much was invested and how much will be invested in the future?
 - Does the land acquirer have all the necessary environmental licences and authorisations?
 - Which rights have been granted to acquirer?
 - Evaluation of the Environmental Impact Assessment (EIA) undertaken for this project
 - Did the EIA comply with environmental impact assessment regulations?
 - Did the EIA include all possible impacts and benefits arising from the project?
 - Has an Environmental Management Plan been established and it is satisfactory?
- *Strategies:* To determine whether the strategies of the acquirers are changing? To determine why acquisitions by foreigners are starting to occur in South Africa.
 - Why are land acquisitions increasingly occurring in South Africa?

- Who chose the specific project site for the land deal and why?
- To what extent did the availability of water play a role in the land acquisition and the site of the land acquisition?
- To what extent is the acquirer involved in upstream or downstream activities, apart from the primary production?
- *Impacts:* To determine the impact from the land deals:
 - Environmental impacts
 - To investigate whether any general or specific environmental impacts have risen or are likely to arise from the land project
 - To investigate the impact of the land project on water resources
 - Social Impacts
 - Is there an impact from the change in composition of workers and working conditions?

1.3 Hypothesis

Related to the case study, the hypotheses of this study are:

1. The land acquisitions of these Chinese initiatives are increasingly occurring in order to gain access to strategic natural resources like water.
2. The structure of the land acquisitions, related to these Chinese initiatives, is increasingly becoming ‘invisible’, thus the Chinese are gaining access to the various production activities rather than merely land.
3. Emerging economies and developed countries are becoming the preferred target of land acquisitions by nations such as the Chinese.

Although focusing on Chinese and Chinese investments, these hypotheses are broader in nature and concern broad dynamics related to the changing facets of agricultural investment and acquisitions globally.

1.4 Delineations and Limitations

Regarding delineations, this project only focuses on land acquisition for agriculture. The delineation of land acquisitions for agriculture is legitimate as it concerns firstly, a rapidly changing and renewed phenomenon which is not fully covered by literature, secondly, huge tracts of land, compared to other sectors, leading to issues of food security and basic rights.

Several limitations can be highlighted. The first limitation of this project is that it draws on data from one case study only, the South Africa-China Agricultural Technology

Demonstration Centre. This does not allow for generalisation of the results obtained from the study. However, analysing the case study will give a good perspective on land acquisition dynamics. Secondly, the case study is in the implementation phase. The result of this is that not all impacts and benefits of the project will be fully visible for this research. This being said, the in-depth fieldwork and resulting assessment will already give precise ideas where the project is heading to.

1.5 Terms and Definitions

A couple of definitions are associated with the land acquisition phenomenon; large-scale land acquisition and land grabbing. Large-scale land acquisitions are defined as transactions which (Anseeuw et al., 2012):

- entail a transfer of rights to use, control or own land through sale, lease or concession;
- Imply a conversion of land used by smallholders to large-scale commercial use;
- Are 200 hectares or larger.

Land grabbing is similarly defined as acquisitions which are one or more of the following (International Land Coalition, 2011):

- In violation of human rights
- Not based on free, prior and informed consent of the affected land-users
- Are in disregard of social, economic and environmental impacts
- Not based on transparent contracts which specify binding commitments
- Not based on effective democratic planning, independent oversight and meaningful participation

However, these definitions do not adequately describe the land acquisition phenomenon in the framework of the new facets described here above, for a number of reasons. Firstly, these definitions focus on the acquisition of land only rather than the inclusion of other natural resources present, like water. Secondly, the current definitions focus on land ownership and control of land. Land acquisition goes beyond the actual ownership of land to who controls the land and output and how it is controlled. Thirdly, should the term violation of human rights, transparency and accountability be present if acquisitions are occurring in emerging economies where property rights are more secure? Broader definitions are needed, in general, however this is not the objective here but this research will contribute to these.

1.6 Motivation for the study

It has been argued that the geographical scale of current land acquisitions are not a concern due to the fact that they account for a small percentage of suitable agricultural land in host countries (Cotula & Vermeulen, 2009). However, due to the uncertainties around land acquisition, along with the country-specific effect that it can have, it is necessary to assess each country and each case individually to ascertain the strategic nature of the acquisition.

This is particularly relevant in South Africa which until recently was seen as relatively ‘untouched’ by land acquisition for agriculture. Indeed, questions over land in South Africa remain sensitive due to the unrealised promises of land redistribution and the increasing number of white farmer murders, coupled with the growing inequalities in the society (Anseeuw & Alden, 2010). Despite the slight successes and achievements made in the land arena in South Africa, conflicts over land have reasserted itself, as a result of the failure to deal with the issue of land in its entirety. These issues create a volatile and unique backdrop for the inclusion of land acquisition into the land matrix.

1.7 Overview of Chapters

Chapter 2, the literature review, provides a brief background to land acquisitions, and then places China in the land acquisition debate. Within the context of land acquisitions, the chapter focuses on the new and interrelated facets. Finally the chapter provides a look into aquaculture. Chapter 3, the methodology, provides an understanding on the case study selection for this research. It also details the research methods used for primary data, secondary and observations. Lastly, the chapter describes the pluridisciplinary approach taken to data analysis. Chapter 4 provides the results obtained in the study in four main sections; the project and land use, processes, Impacts and Perceptions of stakeholders. The project section provides details on the production base and input and output markets. In contrast, the processes section details the land ownership, governance structures, investment structure and environmental considerations for the centre. Environmental and social impacts are considered next. Chapter 5 provides a discussion on the results obtained from various studies regarding China's role in African agriculture and the overall purpose and success of agricultural demonstration centres. The chapter then provides suggestions for further studies before providing a final conclusion.

CHAPTER 2

Literature Review

This chapter provides: 1) An in-depth investigation into land acquisitions, including drivers, benefits and impacts and the parties involved in land acquisitions, 2) China and its role in the land acquisition debate; this includes a look into a number of popular foreign policies implemented, such as the going global policy, and the outcomes of the forum of cooperation between China and Africa, 3) the role of water and other natural resources in land acquisitions, 4) the shift from ‘visible’ to ‘invisible’ land acquisitions, 5) the shift from developing to developed economies as targets for land acquisition, 6) a brief introduction to aquaculture, including a look into the benefits and impacts of aquaculture and the role South Africa plays in the international market.

2.1 Land Acquisitions

The background and mechanics of land acquisitions are discussed in the beginning of the chapter, in order to form the backdrop for this study. This includes the drivers of land acquisition, benefits and impacts of land acquisitions and the parties involved in land acquisitions. The chapter then focuses on China and its role in African agriculture, in terms of providing aid and later acquiring land for the production of agriculture and technology transfer. The policies which supported the forge into Africa’s agriculture are discussed. China’s role in the global aquaculture sector and more specifically China’s introduction into aquaculture in South Africa is introduced. The mechanics of aquaculture and the environmental impacts are then discussed. The role of water in land deals and the concept of water as a strategic resource are introduced. The notion of ‘invisible’ land acquisition is further explored with reference to upstream and downstream production activities. The chapter concludes by discussing the role of emerging and developed economies as the hosts of land deals, in particular South Africa.

2.1.1 Drivers of land acquisition

The pace of land deals since 2000 has been increasing and reached a substantial high in 2009 (Anseeuw et al., 2012). The driver of the rush for land in 2009 was caused primarily by the food price crisis in 2007/2008. With the food crisis in mind, food importing countries were no longer willing to rely on the global markets for their food security (Anseeuw et al., 2012).

In addition, the expectation of long-term increases in food prices is cited as a driver for land acquisitions. However, the current rush for land is not only driven by concerns regarding food security or food prices. There is an increase in demand for food which is driven by the increasing population growth, a change in consumption and increasing urbanisation (Anseeuw et al., 2012). This coupled with declining productivity and environmental services (Anseeuw et al., 2012; Cotula et al., 2009). The prospects of the effect that climate change will have on agriculture are also expected to affect food security (Cotula et al., 2009).

The rising fuel consumption, oil prices and concerns regarding greenhouse gases leads to an increase in demand for biofuels (Anseeuw et al., 2012). Targets to increase the proportion of renewable energy into the energy matrix have led to widespread investments in biofuels production (Anseeuw et al., 2012). Non-food agricultural commodities, such as rubber, tea and sugar, also contribute to the rush for land. This occurs when countries are reliant on imports, for which there are no local alternatives, in order to secure their products on the global market (Cotula et al., 2009). The demand for timber, another driver for land acquisition, has increased significantly leading to the rapid expansion of fast-growth industrial tree plantations (Transnational Institute, 2013). Timber is increasingly being sought in the pulp industry, biodiesel industry and carbon sequestration industry.

2.1.2 Benefits and Impacts of land acquisition

Land acquisition, due to these drivers, has the ability to cause a number of impacts, both positive and negative, to the environment, rights, sovereignty, livelihoods and development (Cotula & Vermeulen, 2009). These impacts occur at the global, regional, national and local scale. The impacts or benefit an acquisition will have depends on, amongst others, the location of the acquisition and the scale, along with the control over ecosystems and economies. At a minimum, land deals need to be evaluated at country and project level. This evaluation will assist in determining the extent of positive and negative outcomes experienced, after accounting for country and project specific facets.

The effect on social development has typically been negative resulting from smallholders losing their livelihood base due to insecure property rights, lower than expected job creation on acquired land, insufficient compensation for lost livelihoods and the possibility of affecting local food security (Anseeuw et al., 2012; Cotula & Vermeulen, 2009; The World Bank, 2010). Large scale land acquisitions typically also have negative effects on the environment through the conversion of natural lands or smallholder agriculture into large-

scale intensive agricultural lands, which often results in land degradation, water pollution, increased use of pesticides, biodiversity loss, loss of ecosystem services and diversion of water from ecological reserves (Anseeuw et al., 2012).

The majority of the land in land deals is unfarmed forests, grasslands and marshlands (Anseeuw et al., 2012). Despite the fact that the land is not under cultivation, it is often held as a communal asset. This land is often seen as available due to weak and insufficient customary land rights. Communities lose access to the land and resources on the land when land acquisition occurs, having adverse impacts on livelihoods (Anseeuw et al., 2012).

Compensation for loss of land, houses and other resources is often not paid to communities (Anseeuw et al., 2012). However, when compensation is paid it is often inadequate (Anseeuw et al., 2012). Land price inflation and increasing competition for land often make it challenging for displaced people to find housing, forcing them to settle on marginal lands (Anseeuw et al., 2012).

The association with commercial enterprises is hypothesised to have positive impacts for smallholders; however this is often subject to the bargaining power of both parties (Anseeuw et al., 2012). The dependence on a processing company or landlord is unlikely to benefit the smallholder (Anseeuw et al., 2012).

The impacts of land acquisition are likely to affect community members in various ways. Members, who are socially and economically marginalised, like women, are likely to be affected more (Anseeuw et al., 2012). Daley (2011) found that the susceptibility of women is due to four reasons. First, women generally lack access to and ownership of land. Secondly, they play a limited role in decision making due to the nature of socio-cultural relations. Thirdly, women are physically vulnerable. Finally, women are subject to high levels of income poverty (Daley, 2011). Although land deals offer women alternative employment, the working conditions further increase their vulnerability (Anseeuw et al., 2012).

Environmental and social impact assessment studies for land acquisitions are often insufficient and non-existent, resulting in harmful effects from the start of the project (Mehta et al., 2012). Richards (2013) studied the social and environmental impacts in 18 case studies on large-scale land acquisitions in Africa. The study found that conversion of forests and uncultivated bush occurred in a number of case studies, leading to biodiversity loss, soil erosion and carbon emissions (Richards, 2013). Large-scale land acquisitions also resulted in

the blockage of key migratory routes in two of the case studies. The effect that land acquisitions can have on water quality and quantity and the related negative externalities is the major environmental concern (Richards, 2013). With the predicted effects of climate change on water availability, the water dimension in land acquisitions can have significant impacts on various water users (Future Agricultures, 2011). Despite the fact that water plays an important role in land acquisitions, it is often ignored in the negotiations (Future Agricultures, 2011).

In contrast, the benefits of land acquisitions for agriculture are: an increase in the global supply of food, increase in land fees and rent, increase tax revenues of host countries, improve infrastructure and market access and supply capital, know-how and technology to host countries (Cotula & Vermeulen, 2009; Cotula et al., 2009). In addition, land acquisition projects can also increase employment opportunities for the locals (Cotula et al., 2009). The smallholder producer can also benefit from the land acquisition through the commercial association with commercial enterprises, through share-cropping and contract farming schemes (Anseeuw et al., 2012).

There are also various direct economic benefits provided by land deals. One such benefit is land and water fees paid to the host governments. However, these fees play a negligible role in negotiations as many governments view them as unimportant (Cotula et al., 2009). The role that land acquisitions play in development and stimulating the local economy substantiate the insufficient land fees charged (Cotula et al., 2009). A further economic benefit from land deals is the taxation on products which increases public revenue. However, tax incentives are often granted by host governments in order to attract investments, thereby reducing the benefit of taxation received from land deals (Cotula et al., 2009).

Host countries also provide numerous incentives for foreign investment in agriculture. African governments are increasingly seeing agriculture as a source of employment and revenue (Cotula et al., 2009). While foreign investment is seen as capable of creating employment, improving infrastructure, bringing new technologies and supplying food to local markets (Cotula et al., 2009).

Land acquisition can assist in achieving the role that agriculture plays in development. It has been indicated as a driver to achieve rural development (Andrianirina-Ratsialonana et al., 2011). This is achieved through the provision of infrastructure and increasing employment opportunities. The extent of benefit received by commitments on infrastructure and

employment is problematic. Case studies reveal that the number of jobs expected to be created by land deals do not materialise and working conditions may become exceedingly poor (Anseeuw et al., 2012). In addition, the lack of inclusion in contracts and the lack of specific-enough wording raise questions as to the legal enforceability of non-compliance (Cotula et al., 2009). Legal values of these commitments can correct this failure (Cotula et al., 2009). Monitoring of compliance is also often insufficient or non-existent (Cotula et al., 2009).

2.1.3 Political Nature of Land Acquisitions

Land acquisitions can be said to be a politically sensitive issue due to a number of factors. One such factor is the envisaged level of corruption involved in securing land deals (Future Agricultures, 2011). Another factor is the influence land deals have on host country policies. Land, food, agriculture and trade policies are restricted by the provisions and legal frameworks which administer land acquisitions (Malik, 2011). Furthermore, land deals are often viewed as lacking transparency. A significant amount of land deals are not reported (Transnational Institute, 2013). Records of land acquisitions and access to information about land deals are often non-existent (The World Bank, 2010). Finally, land deals are politically sensitive as the enforcement of promises made by acquirers during the negotiation stage is challenging, with the host government having little control over the matter (Future Agricultures, 2011).

2.1.4 Parties involved in land acquisition

Numerous factors affect an investor's decision to invest in recipient countries. These include the economic rationale of the project (long-term or short-term concerns) and the legislation and policies of the host government, which affects the environment in which the project operates (Cotula et al., 2009). The economic rationale of the project will also affect whether land is transferred via a direct purchase or land leases, which range from short-term to long-term, after negotiation with the host government. Studies have shown that land leases dominate in Africa (Cotula & Vermeulen, 2009; Cotula et al., 2009).

Land deals have several parties involved: these are the mainly foreign acquirer, the host government as well as the land committees/land owner. The acquirer is usually a private company/individual, foreign government owned company or government, or new actors outside of the agricultural sector (Cotula & Vermeulen, 2009). It has been found that a significant majority of land acquirers are private companies in African countries (Cotula &

Vermeulen, 2009). On the one hand, the private acquirers are typically Western food-producing, processing and export companies motivated by increasing their market share (Anseeuw, 2013 a). On the other hand, new actors acquire land for speculative reasons or are motivated to diversify their portfolios (Anseeuw, 2013 a).

Countries which are capital rich, densely inhabited, food insecure and, in addition, land and water scarce, are also involved in land acquisitions (Anseeuw, 2013 a). Lastly, as Anseeuw *et al.*, (2012), found, nationals acquire land and enter into an agreement with a foreign company, thereby becoming the liaison between the local population and the foreign company. These nationals, motivated by profit, use their connections to establish control over natural resources (Anseeuw *et al.*, 2012).

The land providers are typically private landowners, government and occasionally communities (Cotula & Vermeulen, 2009). Governments are the main land providers in Africa, due to the fact that the majority of the land officially belongs to them (Cotula & Vermeulen, 2009). The reporting on the extent of involvement of government in land acquisition is often vague and complex (Cotula *et al.*, 2009). Taking this into account, five overlapping categories of government involvement have been established: direct land acquisition by central government agencies, sovereign wealth fund investments, state-owned enterprises, support to private investors in host countries and framework involvement and national policy (Cotula *et al.*, 2009).

Five categories of government involvement have been determined to assist in determining the institutional and financial details of land deals. However, it must be noted that these categories do not operate in isolation but rather overlap and reinforce each other. These categories are (Cotula *et al.*, 2009);

1. Direct land acquisition by central government agencies

A ministry in the central government, typically the Minister of Agriculture, acquires land after consultation and negotiation with the relevant host government's ministry

2. Sovereign Wealth Fund Investments

A sovereign wealth fund is a special purpose fund, owned by the government, with specific financial objectives. These funds are managed separately from other government funds. Indirect investments in foreign assets are typically made through

acquisitions of minority shares in public-listed companies. Direct investments in foreign assets occur through a subsidiary operational company or entering into shared-governance joint ventures with state-owned enterprises or private companies.

3. State-owned enterprises

Governments obtain foreign assets through a majority stake in or full ownership of state-owned enterprises. The profit motive of these enterprises separates them from other parastatal bodies.

4. Support to private sector in investor and host countries

Central governments often establish development funds, which provide subsidies and insurance to private companies and state owned companies. In addition, government agencies provide bureaucratic and technical support to private and state owned companies in host countries.

5. Framework agreements and national policy

Investor governments play critical roles in creating enabling environments for acquisition of foreign assets. The enabling environment consists of the regulatory framework in which investments occur. The regulatory framework consists of national policy in the investor and host country, government-to-government agreements and cooperation agreements in agriculture, encouraging technical cooperation, joint research and exchange of information.

In addition to the acquirer and provider, various other parties will be involved in the acquisition through various stages, such as the preparing, negotiating, contracting and operational. These parties include the various ministries in the host country, international contract lawyers, agricultural advisors, host country citizens and civil society organisations (Cotula et al., 2009).

In discussions regarding the parties involved in land acquisition, with particular reference to the land acquirer, the geography of the acquirer does not fully account for the interests at stake (Cotula, 2012). There can be various nationalities in a land deal, due to the wide range of players; lenders and contractors, involved in the implementation (Cotula, 2012).

2.1.5 China in the land acquisition debate

A number of significant debates regarding the geography of land acquisition, including acquisition of land by the Chinese, have taken place in the global arena. The worries of China ‘invading’ Africa through the increase in number of Chinese farmers and citizens on the continent in the past few years, coupled with comments of positive virtues of farming in Africa and the increase in land deals between African countries and China have put China in the centre of the debate (Consultancy Africa Intelligence, 2013). China is often seen as taking the lead in land acquisitions in Africa, partly due to the fact they are the 3rd largest nation acquiring land in Southern Africa in terms of announced projects, however, they rank the 22nd largest nation acquiring land in Southern Africa when considering projects verified (Anseeuw, 2013 a).

Ping (2008) states that China's foreign farming policy rests upon three principles:

- The farms are located in countries, on good terms with China, which have abundant natural resources, a strong labour force and are politically stable
- Companies which are experienced and well-funded are encouraged to invest abroad
- Finally, companies investing abroad must combine their experiences gained from interaction in the Chinese markets with foreign domestic resources

Alden (2005) identified several drivers which have encouraged the Chinese, government and citizens, to acquire land abroad. Firstly, China is looking abroad to secure vital commodities, such as oil and other mineral resources, due to resource scarcity. This economic competitor framework (Buckley, 2011) views China as engaged in a self-interested resource war to feed its growing population, in order to compensate for an overtaxed domestic agricultural sector and changing consumption patterns, and to boost commercial opportunities for national firms (Rotberg, 2008; Buckley, 2013).

The resource scarcity that China is facing is due to strengthening and sustained economic growth. In addition to economic growth, increases in consumption and population with an increase in agricultural land lost to industry, have put food security at risk (Hofman & Ho, 2012; Marks, 2008; Alden, 2005). Many critics argue against the notion that production in these foreign aid projects is exported to China due to the challenges of logistics, high costs of shipping and security risks due to political instability (Consultancy Africa Intelligence, 2013). However, Grain (2009, pg3) in Huggins (2001) believes that investment in

infrastructure is occurring where necessary in order to make exporting profitable, as such land acquisitions are seen as a "restructuring and expansion of the industrial food system, based on capital intensive large-scale monocultures for export markets". Sustaining the debate over exporting of production from Chinese aid project, Future Agricultures (2011) found that most land acquisition contracts do not require the acquirer to sell products to the domestic markets.

Secondly, China invests in Africa to create new markets and further investment opportunities. China makes use of rural and informal trading markets to distribute low-value consumer goods. Joint ventures between Africans and Chinese have led to the establishment of agro-processing plants in Africa. The output is then sold to the western markets at concessional rates (Alden, 2005).

Finally, in addition to resource scarcity and market opportunities, development assistance and symbolic diplomacy is another driver of Chinese investment in Africa (Alden, 2005). Symbolic diplomacy, the promotion of China abroad, is established through numerous large construction projects undertaken in Africa, thereby cementing their role on the international stage (Alden, 2005). Developmental assistance occurs through the provision of loans for African states, providing agricultural training to African farmers, debt forgiveness and military co-operation. The development partner framework (Buckley, 2011) is portrayed by China's development experience in Africa, coupled with their agricultural development successes (Rotberg, 2008; Gabas & Goulet, 2013).

China's desire to form strategic partnerships with African states drives Chinese investment in Africa. China seeks partners to support core issues, like state sovereignty, and strengthen votes to protect interests in multinational institutions, like World Trade Organisation (Alden, 2005). Africa has the ability to form strategic partnerships with China, as Africa and China maintain similar economic and political ideals (Alden, 2005). The coloniser framework (Buckley, 2011) views the aid and diplomatic efforts, provided by China, as a way to reduce the influence which the Western world has over the politics on the African continent and enhance political relationships (Von Braun & Meinzen-Dick, 2009; Buckley, 2013).

Agriculture forms a major platform through which the Chinese provide aid and invest in farmland in Africa. Hofman and Ho (2012) identified three distinctive periods of aid and investment in agriculture by the Chinese; 1949-1999, 2000-2008 and 2009-2011. The first period is primarily characterised by aid, not investments-which are limited and scattered and

only account for 11,000 hectares in Africa. Aid projects are driven by geo-political goals; security, political interests; thereby striving to strengthen its international position. However, aid became economically oriented in 1978 following the economic reforms instituted by President Deng Xiaoping (Bräutigam, 1998, in Hofman and Ho, 2012). These reforms encouraged the Chinese, motivated by profit, to own land in Africa. The China ‘Going Global’ policy was launched, in order to create business opportunities abroad, whereby Chinese firms and citizens are encouraged to invest overseas (Cotula, 2012). China’s ExIm Bank and China Development Bank were established in order to give financial assistance for the development of African agriculture (Alden, 2013).

The second period, 2000-2008, saw the substantial rise of Chinese investments in Africa and South East Asia (Hofman & Ho, 2012). The assistance provided by the Chinese in infrastructure development is seen as a catalyst for investments in land. The Forum on China Africa Cooperation (FOCAC) was formed in 2000. As part of the cooperation, in 2006 the Chinese government implemented the establishment of demonstration centres in selected African countries, South Africa being one of the countries selected, funded through the USD 5 billion China Africa Development Fund. The proposed demonstration centres are listed in Table 1. These agricultural demonstration centres are seen as a way to continue providing aid to Africa, while promoting commercial opportunities for Chinese companies to provide agricultural technology and seed varieties to Africa (Brautigam & Tang, 2009). This approach taken by China, rooted in technical and financial assistance, lays the foundation for long-term involvement in Africa’s agricultural sector (Alden, 2013).

Table 1 Proposed Agricultural Technology Demonstration Centres in Africa (Brautigam & Tang, 2009)

	Country	Implementing province/organization
1	Mozambique	Hubei/Lianfeng Overseas Agricultural Development Co.
2	Sudan	Shangdong/Academy of Agricultural Science
3	Tanzania	Chongqing/Agricultural Tech Co.
4	Ethiopia	Guangxi/Bagui Agricultural Tech Co.
5	Cameroon	Shaanxi/Nongken Agricultural Co.
6	Togo	Jiangxi/Huachang Infrastructure Construction Co.
7	Zambia	Jilin/Agricultural University
8	Liberia	Hunan/Yuan Longping High-Tech Co.
9	Benin	China National Agricultural Development Corporation
10	South Africa	China National Agricultural Development Corporation
11	Uganda	Sichuan/Huaqiao Fenghuang Group (Fisheries)
12	Rwanda	Fujian/Agriculture and Forestry University
13	Congo (Brazzaville)	Academy of Tropical Agricultural Tech.
14	Zimbabwe	Research Institute of China Agricultural Mechanization

The final period, 2009-2011, is characterised by China's investment in new territories, including Latin America, Central Asia and the Pacific (Hofman & Ho, 2012). Investments in agriculture occur in highly industrialised regions with less volatile and more mature markets (Hofman & Ho, 2012). These new regions account for approximately 30 of China's land-based investments in the period. In contrast, regions previously occupied obtain just two new investments.

China's engagement in African agriculture remains a highly contested arena, which has deep historical roots (Buckley, 2011), and forms part of a multi-faceted rapidly evolving phenomenon based on mutual benefit, involving a complex array of actors, which cannot be represented by a single strategy (Taylor, 2006; Brautigam & Tang, 2012; Buckley, 2013).

The China South Africa Agricultural Demonstration Centre is established at the existing Gariiep Dam Fish Hatchery. Inland Aquaculture is defined as "the farming of aquatic animals and plants under controlled or selected aquatic environments (fresh, sea or brackish waters) for any commercial, small-scale, recreational or other public purpose" (Department of Agriculture, Forestry and Fisheries, 2003).

2.2 The role of water and other natural resources in land acquisition

Water acquisition or grabbing can be defined as a state where existing allocated water resources are reallocated to powerful actors, who are able to control the resource and direction of its benefits (Mehta et al., 2012). The global impact of water acquisition, and the resultant virtual water trade, is that previously water-endowed countries will become water restricted countries (Jagerskog et al., 2012). Water acquisition typically occurs when water shortages are experienced by the acquirer. In this context, virtual trade to supplement water shortages is economically cheaper in the short-term than improving water efficiency (Woodhouse & Ganho, 2011).

Water and land are exceedingly intertwined, however the quality and quantity of water granted to acquirers is often not explicitly mentioned in lease arrangements (Jagerskog et al., 2012). Cotula (2011) reviewed 12 land acquisition agreements and found that water requirements and usage was not mentioned in the majority of them, raising concerns over local water rights. In addition, regional repercussions of using transboundary water are infrequently mentioned (Jagerskog et al., 2012). Water management, which can be classified as a form of water control, is inherently political (Mollinga, 2008) Therefore significant local and regional conflicts over water usage by the acquirer can occur when water withdrawals

increase substantially. With this in mind, water needs to be explicitly mentioned in contracts and water usage regulated (Jagerskog et al., 2012).

Water allocation cannot be discussed without noting that water fluctuates in space and time. Thus water allocation, even for non-consumptive use, can have significant impacts on the timing of available water (Mehta et al., 2012). In turn, this can have far-reaching impacts on downstream water users. The fluid nature of water also means that water scarcity and pollution can affect each user of a water basin (Mehta et al., 2012), with impacts likely to be more widespread than expected from the size of the land acquired (Woodhouse & Ganho, 2011). In this case water grabbing occurs through the externalisation of environmental degradation and the costs associated with the degradation. These factors assist in making the details of water rights, usage and responsibilities, with regards to land acquisition, complex (Mehta et al., 2012). Water usage in land acquisitions will remain a complex issue due to the fact that international arbitration for disputes between acquirer and host often favour the acquirer (Future Agricultures, 2011).

2.3 The shift from 'visible' to 'invisible' land acquisitions

New instruments to finance agriculture have been developed. They include contract farming and finance value-chains (Anseeuw & Ducastel, 2013). These instruments often include financial services, marketing and technical support (Deveze, 2008) in (Anseeuw & Ducastel, 2013). Various contracts between processors and farmers ensure that the output from primary production is supplied to the company. In turn the relevant company provides the farmer with the inputs necessary for production, including labour, seeds, agrochemicals, machinery, storage, transportation and consultations (Anseeuw & Ducastel, 2013). In this manner the exchange process is internalised as the company is able to control the complete production cycle from the output quota, technological level and prices. Despite the fact that this system of vertical integration and control is not new, it is being applied more widely than before (Anseeuw & Ducastel, 2013). Although integration by monopolistic agribusiness is not new, integration processes from sectors outside the agricultural sector is presently being initiated. Anseeuw and Ducastel (2013) detail three new models of integration: bank integration within agricultural value-chains, agricultural engineering and asset management company model and investment funds.

In this manner, governments aim to ensure that acquirers contribute to local development through job creation and the direct involvement of small-holder farmers in the supply chain

(Cotula et al., 2009). However, in order to maximise local benefits collaborative business models, such as negotiated contract farming or joint ventures with shared equity, need to be developed which favour both the small-holder and the acquirer

Political and economic factors, including the distribution of risks and returns, have motivated the shift from involvement in primary production to vertical integration (Cotula, 2012). Returns are primarily realised in the processing and distribution of agricultural production while the risks are concentrated with primary production (Selby, 2009, in Cotula, 2012). Therefore, involvement in upstream, including finance and research, and downstream activities, including processing and distribution, allows for the minimisation of risks, greater flexibility to respond to risks and maximisation of returns. These factors encourage acquirers to engage in land deals which are less visible than large-scale land acquisition.

2.4 Emerging and Industrialised Market Economies as targets for land acquisition

Land acquisitions in Africa have increased substantially since 2006; refer to Figure 1 (Anseeuw, 2013 b). Africa has experienced a large number of land deals due to the fact that land and water are abundant, cheap labour is available and leasehold and land prices are low, despite the lack of infrastructure required for production (Jagerskog et al., 2012). However, an overall decrease in land acquisitions in Africa from 2011 has been observed due to two main complementary reasons, see Figure 1.

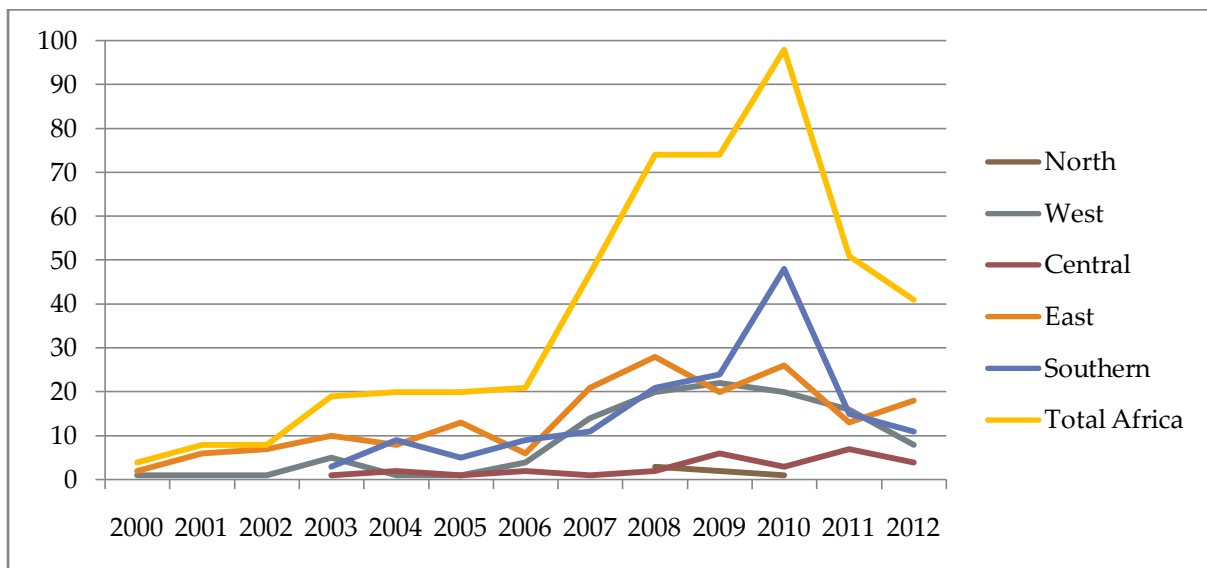


Figure 1 Number of reported land deals in Africa as well as the regions of Africa (Anseeuw, 2013 b)

Firstly, the changing awareness of civil society through research as well as the reactions of the local communities to land acquisitions. Global debate and attention has been paid to the land rush and the effects thereof by national governments, media, and global bodies, prompting the development of standards of good practice for large scale land acquisitions, such as principles for responsible agricultural investment (Anseeuw et al., 2012).

Secondly, the high rate of project failures due to technical and governance issues (Ducastel & Anseeuw, 2013). Anseeuw *et al.* (2012) highlighted four main governance issues:

- failure to recognise and protect customary land rights
- failure of policy to support smallholder agriculture
- failure to make concrete decisions on future land use, which affects the future of agricultural systems, in a fair and transparent manner
- failure of governments to protect human rights and sustainability concerns

“It is clear that the governance failures described above create conditions that disable good decision-making and enable harmful transfers of land” (Anseeuw et al., 2012, p.57).

The financial crisis has played a minor role in the slow-down of land acquisitions in Africa (Merian Research, 2009); maybe for the better as more suitable and better prepared projects will be established. Nonetheless, a long-term trend of growing commercial interest in land is still visible (Anseeuw, 2013 b); resulting in new investments in new targets where infrastructure is available and governance structures are reliable, resulting in stable investments.

One such target is Australia, which has recently been subjected to a number of land acquisitions. Australia has seen a significant increase in foreign investment and ownership of agricultural land in recent years. Foreign owned agricultural land in 1984 was 5.9% of agricultural land in Australia. In 2010, 11.3% of the agricultural land was foreign owed (Rural Industries Research and Development Corporation, 2011). In addition to Australia, evidence suggests that there has been acquisitive interest in New Zealand and North America (Anseeuw et al., 2012). Similarly, Europe has increasingly been a target of land acquirers (Transnational Institute, 2013).

Prior to BRICS (Brazil, Russia, India, China and South Africa), which has also encouraged a number of land deals to occur between the parties (Future Agricultures, 2011), South Africa was seen to be relatively ‘untouched’ by land acquisition, however with the increasing

scarcity of natural resources coupled with increasing pressures from maintaining industry output, South Africa, in addition to the other Emerging Market Economy Countries, could become the next target of land acquirers.

2.5 Aquaculture background

Aquaculture is the agricultural sector currently experiencing the largest growth, due to the increasing demand for fish products coupled with the declining fish stocks (Department of Agriculture, Forestry and Fisheries, 2003). In fact, aquaculture has increased its contribution to total production by weight from 3.9% in 1970 to 32.4% in 2004 (Food and Agricultural Organisation , 2006). Asia and the Pacific region accounted for 91.5% of the aquaculture production in 2004, with China accounting for 80.5%. Africa only accounted for 1.02% of the production (Food and Agricultural Organisation , 2006).

China started aquaculture 2000 years ago, with rapid development occurring since 1970 under reform policies (Cao et al., 2007). Intensive production techniques were introduced in conjunction with the reform policies. This is one of many factors which have led to substantial environmental pollution from the aquaculture sector in China. The location of the major pollution hotspots in China coincides with the location of aquaculture farms. China is currently the largest producer of fish, producing over 32 million tonnes in 2008 (Cao et al., 2007; Department of Agriculture, Forestry and Fisheries, 2011). China's presence in aquaculture will continue to grow and play an important role in the global supply of aquaculture products (Cao et al., 2007).

South Africa produces on average about 0.01% of the World's output, with production sold on both the domestic and international markets (Department of Agriculture, Forestry and Fisheries, 2011). The Western Cape Province is the highest exporter, with exports from Free State, North West and Limpopo Province irregular (Department of Agriculture, Forestry and Fisheries, 2011). Spain obtained 21.7% of South Africa's exports in 2010, while China obtained 18.6%. However, China experienced a 41% growth in value of South African exports between 2006 and 2010, the highest for the period (Department of Agriculture, Forestry and Fisheries, 2011). Imports of aquaculture products have been increasing, with an average of 36 million kilograms imported during the past decade, with imports coming mainly from India, New Zealand and China (Department of Agriculture, Forestry and Fisheries, 2011).

Freshwater aquaculture in South Africa is constrained by the scarcity of water and seasonal temperature fluctuations (Hecht & Britz, 1990). The choice of species to use in production is an additional constraint (Rouhani & Britz, 2004). This is due to the fact that the majority of indigenous and introduced species have low market values. Additional constraints limiting the growth of the aquaculture industry in South Africa are; lack of technical support for farmers, access to water rights of sufficient quantity and quality, difficulties in obtaining the appropriate production technologies, difficulties in obtaining financial support for aquaculture ventures, limited human resource capacity, high production costs and insufficient knowledge of market needs (Department of Agriculture, Forestry and Fisheries, 2003; Department of Agriculture, Forestry and Fisheries, 2011). In order to overcome the majority of the constraints, enterprises will require more capital, skills intensive production methods (Rouhani & Britz, 2004). These requirements can affect the success of rural aquaculture ventures.

Aquaculture has been considered a source of affordable protein for rural communities since the 1950's, and therefore directed at small-scale farming (Rouhani & Britz, 2004). Aquaculture can contribute to food security and development in rural communities; however this contribution has been negligible in South Africa (Rouhani & Britz, 2004). Rural aquaculture in South Africa has failed to reach its potential for a number of reasons. Food security and commercial small scale aquaculture projects did not fail due to a lack of water, land or infrastructure (Rouhani & Britz, 2004). Food security aquaculture projects failed because participants possessed little personal capital, education and training. In addition, these projects had too many beneficiaries while producing goods of low value, therefore the income per beneficiary was low (Rouhani & Britz, 2004). In contrast, commercially oriented small scale aquaculture projects employ more capital intensive technology, a formal market exists for goods produced and participants possess personal capital. However, projects fail due to lack of extension services, training and technical support (Rouhani & Britz, 2004).

Aquaculture ventures which lack sufficient planning and site selection have the ability to cause environmental degradation. The location and production technology employed will influence the nature and extent of the environmental consequences of the aquaculture project (Pillay, 1992). However, it must be recognised that the environmental consequences from fish farms are not always necessarily negative, but can in fact be beneficial to effective environmental management and social well-being (Pillay, 1992). Table 2 depicts selected impacts of irresponsible aquaculture and possible benefits of responsible aquaculture.

Table 2 Environmental Costs and Benefits of Aquaculture (The World Bank, 2006)

Negative Environmental Impacts of Irresponsible Aquaculture	Environmental Benefits from Responsible Aquaculture
<ul style="list-style-type: none"> • Loss or degradation of habitats such as mangrove systems • Salinisation of soil and water • Coastal and freshwater pollution • Alteration of local food webs and ecology • Depletion of wild resources and biodiversity for seed • Spread of parasites and diseases to wild stocks • Impacts of introduction of exotics • Depletion of wild genetic resources through interactions between wild populations and cultured populations 	<ul style="list-style-type: none"> • Preservation of wetlands • Weed control • Pest Control • Recovery of depleted wild stocks • Nutrient and heavy metal sink • Water treatment and recycling • Agricultural and human waste treatment • Disease vector control • Desalination of sodic lands

Fish farms often lead to the conversion of vegetation, primarily wetlands, where water for aquaculture is readily available (Pillay, 1992). Fish farms have to be located on lands with access to surface or ground water, often causing conflicts with other land uses. Despite the fact that water in aquaculture is considered ‘non-consumptive’, losses can occur due to soil properties and climatic conditions (Pillay, 1992). The abstraction, retention and drainage of surface or ground water in land-based aquaculture systems can have significant environmental consequences (Pillay, 1992). The continual pumping of sub-soil water for aquaculture can alter the water table in the area, thereby adversely affecting the underground water in the area. Salt penetration can occur when brackish or salty water is used on farms, causing the area to become unsuitable for various land uses (Pillay, 1992). Soil erosion can occur where farms are located close to water ways without a tolerable protective boundary (Pillay, 1992).

The principal wastes released from aquaculture farms are solid wastes, chemicals, pathogens and alien species (Cao et al., 2007). Faeces and remaining food pellets are the main compositions of solid wastes, or particulate organic matter. Pillay (1992) found that the levels of concentration of ammonium, nitrogen and phosphate-phosphorus doubled in adjacent water columns due to the accumulation of fish faeces in mussel farming. Inorganic phosphorus is the most common primary production growth limiting factor in freshwater environments (Dugdale, 1967). In addition hydrogen sulphide can be produced during the production process, leading to a reduction in fauna when organic loading occurs (Pillay,

1992). The process of hypernutrification, a significant increase in dissolved nutrient concentration, and resulting eutrophication, increase in phytoplankton growth and productivity, often occur from effluent discharges from aquaculture farms (Pillay, 1992).

Chemical residues released in effluents can have lethal effects on non-target organisms or effective microbes (Cao et al., 2007; Pillay, 1992). These chemical residues typically comprise of chemical remains from disinfection of ponds, residues from control of pests, hormones, anaesthetics and from the treatment of diseases (Pillay, 1992).

The release of alien species through effluents can have several adverse effects. These include: predation and competition with indigenous fauna, hybridisation, introduction of pathogens carried by exotic species and reduction in genetic diversity (Pillay, 1992). These alien species could carry strains of exotic diseases, which can have devastating effects on indigenous species (Cao et al., 2007). The ecological value and scenic beauty of water bodies can also diminish due to the release of exotic species. In addition, the location of aquaculture farms can disturb feeding and breeding grounds of birds and aquatic mammals. This in turn affects population size or established feeding and breeding habitats (Pillay, 1992).

Markmann, 1982 studied the effects of effluents from land-based pond farms in Denmark and found the following chemical and physical changes downstream of the pond:

- Potentially toxic concentration of ammonia
- Reduced concentrations of dissolved oxygen in the stream
- Amplified concentrations of ammonia, nitrate, phosphate, suspended organic solids, dissolved organic substances
- Fine-grained and homogeneous sediment

These changes alter the ecology of organisms downstream of the pond and lower the productivity of the water body (Cao et al., 2007). However, Alabaster, 1982 and Solbe, 1982, did not find any changes in species composition downstream of fish farms. It must be noted that effluent quality, and the resulting impacts, are influenced by annual production per unit volume, retention time of water, depth and temperature of water, food supply, cleaning processes and use of chemicals (Pillay, 1992).

CHAPTER 3

Methodology

Detailing the research design and framework of analysis

This chapter will detail the methodology implemented for this research, allowing an exploration of the renewed facets of land acquisition. This chapter provides: 1) a brief background and description of the case study chosen for this research paper, 2) a detailed overview of the research methods used to obtain both primary and secondary data for this research, 3) the data analysis techniques chosen to analyse the data obtained from the case study.

3.1 Research Design- Case Study Selection

Land acquisition can result in diverse processes and outcomes (Borras & Franco, 2010). Taking this into account, coupled with the country-specific politics regarding land and natural resources, there is a need to investigate land acquisition deals in-situ. As such, this research is based on one in-depth case-study, which was investigated and analysed in-situ in order to draw conclusions for this study. The case study is the South Africa-China Agricultural Demonstration Centre, located on the Orange River, see box 1.

The reason for selecting one case-study is:

- Firstly, it was the only project identified, when the research commenced, which met the research criteria,
- Secondly, sufficient information was available and could be obtained, regarding the project, in order to complete the research.

Other case studies were identified during the timeframe in which the research project was undertaken². However, data from these case studies was scattered and could not be identified. Thus primary and secondary data obtained, about these case studies, was only used to compliment the selected case study.

² See Appendix 1: Additional Chinese Land Acquisition Projects in South Africa

Box 1: Case Study Location

The South African China Agricultural Demonstration Centre is located at the existing Gariep Dam Fish Hatchery. This centre is located below the Gariep Dam Wall on the Orange River, see Figure 2, on Portion 1 and 3 of the farm Waschbank 274. Figure 3 provides an aerial view of the facilities which are currently at the hatchery. The co-ordinates for the centre are: 30°37'35,82"S 25°28'24,61"E. The site stretches approximately 580 meters East to West and 740 meters North to South (Song, 2013 a)

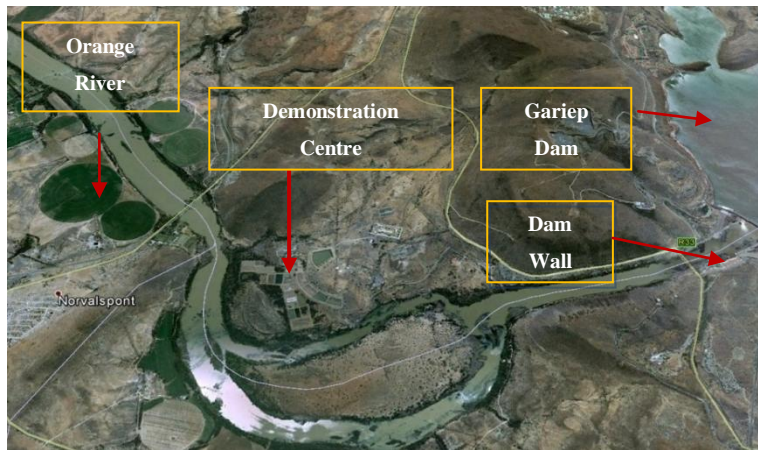


Figure 2 Location of the South Africa China Agricultural Demonstration Centre (Google, 2013)



Figure 3 Facilities at the existing Gariep Dam Fish Hatchery (Google, 2013)

Case study research design was chosen for this study as it allowed for an intensive study to be undertaken by focusing on a single case of the broader land acquisition phenomenon (Gerring, 2004). Case study research design was also chosen as it addressed one example of the land acquisition phenomenon in South Africa, of which little was previously known (Gerring, 2004). The case chosen for this research was based on the research aims, objectives, theoretical context, accessibility, resources and time (Rowley, 2002).

The single case study covered in this project favours an in-depth intense study of the case, compared to numerous case study research design, which are mainly studied superficially (Rule & John, 2011). As such, this research provides an insight and understanding into the South Africa China Agricultural Demonstration Centre case study through the provision of a description of the project, from qualitative data collected, while developing the hypothesis of the new facets of land acquisition. Therefore this research takes the form of both the exploratory and descriptive case study (Rule & John, 2011).

A positivist and deductive approach to case study design allowed us to pose research questions and propositions prior to the data collection stage (Rowley, 2002). This approach was chosen for this research paper as it allowed us to structure data collection and analysis in order to achieve the study objectives (Rowley, 2002). In addition, it allowed us to manage and address the issues of validity and reliability in advance³. Techniques which enhance reliability and validity, like triangulation and audit trails, were used in this research to reduce errors and biases, which occur during data collection.

3.2 Research Methods

Three research methods were used in this research, namely *primary*, *secondary* and *observational*.

3.2.1 Primary data

Survey based-research methodology was used to gather primary data about the South Africa China Agricultural Demonstration Centre case study. Participants in the survey-based research were divided into two categories, namely Key stakeholders and ‘Non-key; stakeholders.

³ For more information on reliability and validity see Rowley, (2002), Sage Publications Inc, (2010)

3.2.1.1 Key stakeholders

Key stakeholders are defined as stakeholders of the land acquisition project which have detailed and comprehensive knowledge and information about the project and may have been or will be directly or indirectly involved in the project initiation, design, construction, operation or decommissioning.

Primary data from key stakeholders was obtained through the use of predominantly qualitative research instruments. Quantitative research instruments were used to complement the purposive sampling technique employed, due to the fact that the research study has various objectives (Patton & Cochran, 2002). The quantitative data collected assisted in shedding light on data which would otherwise not have been obtained through the qualitative data collection (Sage Publications Inc, 2010).

Two sampling strategies were implemented:

- 1). Key stakeholders were identified through site visits, referrals via other key stakeholders and press release and news articles relating to the case studies. Therefore the initial sampling method chosen for key stakeholders is defined as purposive sampling⁴. It must be noted that sampling was not statistically representative and rather chosen in order to obtain a diversity of viewpoints from the study participants⁵.
- 2) Chain referral sampling was also utilised in order to identify key stakeholders⁶. This sampling method was utilised where key stakeholders, who participated in the study, felt that other stakeholders within their social network would form valuable key stakeholders to the study.

⁴ Purposive sampling occurs when study participants are selected on the likeliness of generating valuable data for the research, Patton & Cochran, (2002)

⁵ Non-probability sampling was used as the sample was not required to be representative of the population and statistics were not used to analyse the results and make inferences about the population, therefore the probability sampling method would have been impractical.

⁶ Chain referral sampling, considered a subset of purposive sampling, is the use of social networks of established study participants in order to identify additional potential participants, Mack *et al.*, (2005). Chain referral sampling is a non-probabilistic sampling method whereby study samples chosen through other sampling methods, such as convenience sampling, are used as informants to identify additional study respondents (Penrod *et al.*, 2003).

Table 3 South Africa- China Agricultural Demonstration Centre Key Stakeholders interviewed

Interviewee Class	Number of interviewees
Political Organisations	4
Municipality representative	1
Department of Environmental Affairs	1
Department of Water Affairs	1
Gariap Nature Reserve and Nature Conservation representative	1
Media Reporters	2
Chinese Representatives	2
Total	12

As per Table 3, twelve in-depth interviews were conducted with stakeholders of the South Africa- China Agricultural Demonstration Centre. Various key stakeholders were interviewed more than once in order to obtain additional and updated information. This was necessary due to the fact that the case study was in its initiation and construction phases where decisions regarding the project were not fixed. The interviews of key stakeholders were conducted over a period of four months from June to early September 2013.

In-depth interviews were conducted with key stakeholders in their preferred location. In-depth interviews were utilised to obtain a complete view of the participant's perspective on the research topic, which was vital to gain an in-depth understanding thereof (Mack et al., 2005; Patton & Cochran, 2002). This type of interview was chosen as the research case study only had modest publically available information (Patton & Cochran, 2002). In addition, in-depth interviews were chosen as it allows for deviation during the interview in order to obtain comprehensive knowledge from the interviewee.

Interviews were primarily conducted face-to-face; where this was not possible interviews were conducted via telephone conversations. One-on-one in-depth interviews were conducted with key stakeholders, with the aim of obtaining all the information stakeholders had or would share about the case study. In addition the stakeholders' perceptions and attitudes towards the case studies were obtained.

The structure of the interview guidelines differed per stakeholder to account for the differing and independent knowledge each stakeholder held regarding the case studies, see Appendix 2: Questionnaires for Key Stakeholders. However, five broad sections were present in all the interview guidelines:

- The project; description of the case study in terms of land use, production process, output and market.
- Processes; acquisition process, governance and operational structure of the project and environmental authorisations and licenses.
- Strategies; questions with regard to the location of the case studies and the role of water and production activities.
- Impacts; social and environmental impacts arising from the deals.
- Perceptions and attitude toward the project; the perception of the necessity and benefits of the project and the attitude of the stakeholder towards the nationality of the acquirer.

3.2.1.2 'Non-key' stakeholders

'Non-key' stakeholders are stakeholders of the land acquisition project who are not expected to have detailed information about the project as they merely reside in the location of the project and are aware of the existence of the project. These stakeholders were interviewed to gain an understanding into their perceptions and attitudes regarding the case study.

Data was obtained from 'non-key' stakeholders by performing a one-on-one structured interview. The aim of interviewing 'non-key' stakeholders was not to obtain representative data from the population, instead 'non-key' stakeholder's perceptions and attitudes towards the land acquisition case study. The sample population was defined as residents and organisations which reside in the vicinity of the case study site. Stakeholders were identified using convenience sampling and chain referral sampling.

Convenience sampling⁷ was used for selecting the 'non-key' stakeholders for the reason that information and sources of information were unknown, therefore any source of information from any 'non-key' stakeholder was conveniently gathered on a non-statistically representative and non-probability basis⁸. This sampling method identified study participants which were readily available and willing to participate.

In addition to convenience sampling, chain referral sampling was used for 'non-key' stakeholders as the researcher found that many of the independent stakeholders identified via convenience sampling were unwilling to participate in the study. The social networks of the

⁷ Convenience sampling defines a population in which samples have been selected based on their accessibility to the researcher (Ross, 2005).

⁸ See 5

willing participants proved to be robust, with a number of face-to-face interviews as a result thereof.

Table 4 South Africa- China Agricultural Demonstration Centre 'Non-Key' Stakeholders interviewed

Interviewee Class	Number of interviewees
Hotel and Guest House Representatives	5
Business Chamber Representative	1
Restaurant representatives	1
Total	7

As per Table 4, seven ‘non-key’ stakeholders were interviewed through the use of structured interviews. A structured interview was chosen as it is easier to analyse and categorise the responses. This type of interview allowed for preparation in order to ensure all vital questions and topics were covered during the interviews. The chosen stakeholders were contacted by email or telephone and requested to participate in the study. The interviews were conducted over a period of four months from June to early September.

Interviews with study participants for this study was challenging due to the high mobility of populations, participant concerns over confidentiality, lack of information or possible stigmatisation of participants resulting from an association with the study, time constraints, and unwillingness to participate in the research.

The interview questions were directed at both a personal and organisational level due to the fact that the study participant fell within various sectors in the project area, see Table 4, while also being a resident in the area of the case study. Questions posed in the sections were evaluating interviewee perception and attitude towards the case study, and not necessarily aimed at obtaining the facts of the project, see Appendix 3: Questionnaires for 'Non-Key' Stakeholders. The interview guidelines for ‘non-key’ stakeholders were comprised of six sections:

- Demographic of the interviewee; sector in which the interviewee is found in and the number of years the interviewee had lived in the project area.
- The project; description of the case study in terms of land use, production process, output and market.

- Processes; the acquisition process, governance and operational structure of the project and environmental authorisations and licenses.
- Strategies; questions with regard to the location of the case studies and the role of water and production activities.
- Impacts; social and environmental impacts arising from the deals.
- Additional perceptions and attitudes section; the perception of the necessity and benefits of the project and the attitude of the stakeholder towards the nationality of the acquirer.

3.2.1.3 Reduction of errors for a politically sensitive topic

A test field trip was performed in order to ascertain whether the questions are misinterpreted by key and ‘non-key’ stakeholders, in order to minimise selection errors (Williams et al., 2006). The test field trip also assisted in ensuring that the study objectives and questions were linked to the questions asked during data collection, thereby reducing subjectivity and increasing construct validity (Rowley, 2002).

Processing errors, data incorrectly recorded and transferred, was minimised as interviews from both key and ‘non-key’ stakeholders were recorded, which also assisted in cross-referencing data. Triangulation was applied to this research as data was obtained through various sources including interviews with various subjects, documents and observation, over a variety of timescales, which allowed us to gain an extensive, in-depth and holistic understanding about the cases. Various sources of data were used for this research in order to overcome deficiencies in data from a single method, to corroborate findings and to gain data which could not be obtained through other approaches⁹. Data was collected from interviews, document review and observations, over a period of June to early September with a variety of key and ‘non-key’ stakeholders. Recording of interviews and documentation of research procedures also assisted in ensuring that the research undertaken is reliable, in that this research can be repeated with similar results being achieved (Rowley, 2002).

3.2.2 Secondary Data

Secondary data, including documentation regarding plans, project structure and project governance, were also collected from both key and non-key stakeholders, in order to corroborate findings from interviews and observations.

⁹ For more information on triangulation see Rowley (2002) and Sage Publications Inc (2010)

Document review was used to gather background information, which is independent and verifiable¹⁰, on the case study which enabled us to prepare and to formulate questions for interviews. In addition, it also aided in comparing stated program or activity goals and implementation to contractual goals and implementation. This document review was therefore a good basis for background information to supplement the primary data collection, which may otherwise not have been attained.

It is important to note that these were not personal documents of the study participants. Supplementary documents were identified through identifying elements in the research objectives which may be contained in reports and other documents. Triangulation with data collected in the interviews was used in order to ensure that information in the documents was accurate and complete.

Some documents reviewed include:

- Environmental impact assessment report
- Environmental management programme
- Free State Provincial Legislature, November 2011
- Free State Legislature Agricultural and Rural Development Summit, 2012
- Free State 2013/2014 Budget Speech by the MEC
- Proposed operational Plan for the South African China Agricultural Demonstration Centre
- Letter from the office of the Koponong Municipal Manager re: Approval for opening of fish processing plant, dated 11 September 2012
- Application for approval of building plans of fish processing plant, dated 17 May 2013
- A brief introduction of the China-South Africa Aquaculture Demonstration Centre, 2013

3.2.3 Researcher Observations

Observational data was obtained on site visits to the case studies. Observation was useful in gaining an understanding about a physical setting, thereby assisting to increase the researchers understanding of the case study (Department of Health and Human Services, 2008). Data obtained via observation was in the form of photographs and a research diary.

¹⁰ For more information on document review see Centre for Disease Control and Prevention (2009)

3.3 Data Analysis

Qualitative data analysis of the selected case study involved restructuring, reducing and rearranging of the data in a systematic and continuous process, in order to draw patterns and conclusions specific to the case study as well as to the wider land acquisition phenomenon.

A pluridisciplinary approach was developed to account for the different dimensions of the case studies. In addition to the economic and organisational aspects, the social and environmental features are as important. The following criteria were used to assess the data obtained for the case studies:

- *The land project and land use*: In-depth description of the land acquisition project (ownership, production activities, investment, labour, outputs and markets)
- *Processes*: Structure of the land deals and process of land acquisition
- *Strategies*: Strategies of the land acquirers
- *Impacts*: Social and environmental impacts of land acquisition deals

Box 2: Evaluating the environmental impact assessment report

The environmental impact assessment reports and environmental management programmes obtained for the South Africa- China Agricultural Demonstration Centre were compared and contrasted to the environmental impact assessment regulations 2006, regulation in terms of Chapter 5 of the National Environmental Management Act, 1998. These regulations include R385, R386 and R387. The 2006 regulations were used instead of the 2010 regulations as the environmental impact assessment was undertaken in during 2008-2009 and the authorisation was obtained in 2009. In addition, the Environmental Impact Assessment and Environmental Management Guideline for Aquaculture in South Africa were used to assess the environmental impact assessment reports and environmental management programmes for the South Africa- China Agricultural Demonstration Centre.

Analysis triangulation, the use of several analytic approaches to enhance the breadth and depth of conclusions drawn (Sage Publications Inc, 2010), was applied to the data obtained. The following data analysis techniques were used within the framework criteria:

- Thematic Analysis was used to extract recurring themes/ attitudes or perceptions from the data collected¹¹.

¹¹ For more information on thematic analysis see Patton & Cochran, (2002)

- Narrative analysis takes a comprehensive view of a number of study participant's attitudes or perceptions in order to relate them to the recurring themes obtained through thematic analysis¹²
- Content analysis was useful in understanding and mapping relationships between key concepts established in both verbal and non-verbal communication messages¹³.

¹² For more information on narrative analysis see Patton & Cochran, (2002)

¹³ For more information on content analysis see Sage Publications Inc, (2010)

CHAPTER 4

Results

The results and a discussion on the results obtained from the research are detailed under four main headings:

- The land project and land use
- Processes
- Impacts or benefits arising from the acquisition
- Perceptions of Stakeholders regarding changing strategies

4.1 The land project and land use

This section provides an in-depth description of the land acquisition project. In order to achieve this, three subsections are presented:

- The project, a general background to the land acquisition project is provided
- The layout and facilities on the project site
- Details on land use, production base and output market are provided, prior to the acquisition and after the acquisition

4.1.1 The project

The project is based on the premise of providing training and demonstration of freshwater aquaculture to communities and scholars within South Africa and Southern Africa, through a variety of technologies.

Two operational state owned hatcheries in South Africa were the preferred locations for the South Africa-China agricultural demonstration centre, these being the Gariep Dam Hatchery, in the Free State Province, and the Turfloop Breeding Station¹⁴, in Limpopo Province (Song, 2013 b). The Gariep Dam Hatchery was chosen for the construction and operation of the

¹⁴ The Turfloop Breeding Station was built in 1982 by the former Department of Agriculture for the Lebowa Government. This facility was built to stock local dams with catfish and carp. Productivity at the hatchery has declined in the 1990's resulting in no production in 2003 (Rouhani & Britz, 2004). Production declined due to the decline in the market for the output. The facility has 20 earthen ponds and a well equipped hatchery (Rouhani & Britz, 2004).

centre after feasibility investigations and technical studies were undertaken by the Chinese government, mainly due to concerns about the availability of water for production (Song, 2013 a). According to the Basic Assessment Report, the Gariep Dam Hatchery was chosen as it would have the least impact on the environment while being able to address the needs of the Agricultural Technology Demonstration Centre due to the existing infrastructure at the hatchery (Enviroworks, 2009). This site was deemed the only feasible and reasonable site for the development of the centre (Enviroworks, 2009).

The Gariep Dam Hatchery was originally built as a research and fingerling supply station in the late 1970's- early 1980's with food production in mind (Rouhani & Britz, 2004). The 47 hectare site consisted of 12 hectares of ponds including an indoor hatchery, electricity, road infrastructure and a well developed water network (Rouhani & Britz, 2004).

The stated aims of the centre are to (Song, 2013 a; Song, 2013 c)¹⁵:

1. Conduct research on freshwater aquaculture breeding and technology and select seeds for local conditions.
2. To demonstrate and promote freshwater aquaculture technology and management practice
3. To develop technology extension and train farmers from South Africa and neighbouring countries
4. To ensure that the project has long-term sustainability by cultivating and promoting freshwater fish consumption in South Africa.

The overall aim of the centre is to introduce Chinese aquaculture farming technology and manufacturing philosophy. This can assist in stimulating local economic development, increasing job opportunities and improving the communities dietary and nutritional structure through the introduction of fish into diets (Song, 2013 a).

The centre will incorporate the following proposed technology (Enviroworks, 2009):

- Freshwater breeding technology (African catfish and Tilapia)
 - Screening and strengthening of parent technology,
 - Induced spawning and insemination technology,
 - Artificial incubation of fertilized eggs technology,

¹⁵ Refer to appendix 4 for more information

- Fry rearing technology,
- Breeding with artificial diet technology.
- Efficient and healthy freshwater culture technology:
 - Pond freshwater culturing management technology –
 - Daily management and quality management systems,
 - Water quality control technology in pond culture –
 - Water quality test and ecological regulating,
 - Pond culture disease control technology –
 - Disease preventing, diagnosis and treatment
 - Feedstuff feeding technology,
 - Demonstration of efficient mechanical cultivation in pond –
 - For example the increasing-culture machine and automatic bait casting machine
 - Fishing, storage and transportation of pond marketable fish.
- Optimal regulation and self-purification technology of pond cultivation water environment:
 - Pond culture can be divided into: main culture area, poly-culture area, wetland purification area and water source area.
- Culture and breeding technology demonstration of ornamental fish (Goldfish and ornamental Carp)
- Cooperative research on the resource protection of South African indigenous fish

4.1.2 Layout and facilities at the project site

The majority of the facilities on-site were not upgraded, as they were in running condition from the original Gariep Dam Hatchery. The upgrades completed were: the demonstration centre, the specialist housing facilities, the breeding room, diesel boiler room and the feeding technologies installed in the outside ponds.

According to the Basic Assessment Report, the design for the Agricultural Technology Demonstration Centre was completed on the basis of the implementation scheme provided by the China National Agricultural Development Group Corporation (Enviroworks, 2009). This design was based on the design and technical code of China at the time of construction in conjunction with the local building conditions in the Republic of South Africa. Figure 4

provides an overview of the environment surrounding the demonstration centre and a schematic of the facilities on site.



Figure 4. Overview of the setting and facilities at the demonstration centre (Fraser, 2013)

The infrastructure on the site consists of the demonstration centre, which is 1062m² and houses an office building, laboratory, meeting rooms, training rooms and exhibition space, see Figure 5. In addition to the demonstration centre, specialist housing facilities have been built with a footprint area of 292m², see Figure 5.



Figure 5 a. Administrative building on the site, b. staff living quarters (Fraser, 2013)

The breeding room has a footprint of 1008m² fitted with 56 large culture tanks (2.5m in diameter) and 30 small culture tanks (2m in diameter), see Figure 6. Water is dispatched into the culture tanks via two reservoirs situated inside the breeding room on the Eastern and Western side of the building (Song, 2013 a). The tanks can hold a total of 320m³ of water. Oxygen is supplied to the tanks via a blower, blowing air directly into the tanks, see Figure 6. Six blowers have been installed with an electrical load of 1.1kW each (Enviroworks, 2009; Fraser, 2013).



Figure 6 a. Hatchery tanks with big tanks on the left and small tanks on the right, b. blowers and pipe work into the tanks (Fraser, 2013)

In order to ensure that the water temperature inside the tanks is kept constant throughout the year a hot water boiler, with a capacity of 2 ton, has been installed in a boiler room, see Figure 7. The boiler room houses the boiler body, circulating pump, controlling tank, controlling pressure water supply equipment, oil storage tank, daily oil tank, oil pump and hose and water softening tank. The boiler room has a footprint of 78,12m². Diesel is supplied to the boiler via a 30 000L above ground diesel tank installed within an impenetrable bund wall area constructed according to SANS 10089:1 standards, see Figure 7 (Enviroworks, 2009; Fraser, 2013).



Figure 7 a. hot water boiler body, b. 30 000l diesel tank, feeding into the boiler (Fraser, 2013)

Water supply for the centre consists of, firstly, water for specialist housing and experiment and, secondly, for the outdoor fish ponds. Water for living and experiments is obtained via the existing municipal water pipeline which fills the existing 750 000 l reservoir (Song, 2013 a). The effluent from the experts living quarters and the demonstration centre is released to two biological stabilisation ponds located in the North Eastern side of the project site (Enviroworks, 2009).

Water supply for outdoor fish ponds is channelled to the facility via a pipeline directly from the Gariep dam wall (Fraser, 2013). Water is bought from the Department of Water Affairs and Forestry. The water capacity for the outdoor fish ponds has not increased from the original water capacity for the Gariep Dam Hatchery.



Figure 8 Channelling of water from Gariep Dam between the ponds on-site on the left and small outside pond on the right (Fraser, 2013)

The facility has 36 outside dams, approximately 6.67 hectares, which are all linked to water, electricity, roads, oxygen machines and feed casting machines, see Figure 8 and Figure 9 (Song, 2013 a). The dams are grouped into 6, where each group forms an independent system with waste water recycling and processing (Song, 2013 a).



Figure 9 Pond for large fingerlings on the left with feeding lines and channelling of water on-site with Chinese interpreter, Mr Song, on the right (Fraser, 2013)

In addition to the facilities which are currently on-site, the construction of a feed processing plant is being debated by the Free State Department of Agriculture, Fisheries and Forestry and the Chinese technical experts (Zhao, 2013). However, an environmental impact assessment for the plant still needs to be undertaken as well as the development of the building plans (Zhao, 2013).

4.1.3 Land Use, Production Base and Output Market

Table 5 outlines the land use, production base, output quantity and market of the project prior to acquisition and after acquisition. The Chinese had originally planned to supply the centre with various fingerlings, which are currently successfully bred in freshwater aquaculture projects in China. However, due to the regulations in terms of the National Biodiversity Act 10 of 2004, the introduction of alien species is prohibited in South Africa. The Chinese counterparts were not expecting limitations to be set on which species would be bred at the centre and were surprised that, in this case, environmental legislation is upheld over development (Song, 2013 b). This led to a compromise between the counterparts where by Sharp tooth Catfish, Mozambique Tilapia and Carp were chosen for production for various reasons.

Sharp tooth Catfish and Carp were suggested by the Department of Agriculture, Fisheries and Forestry as these species were bred at the original Gariep Dam hatchery and have a good market (Zhao, 2013). Mozambique Tilapia was chosen for breeding purposes, suggested by the Chinese technical experts because there is a high meat to weight ratio, the meat is high in proteins, the species are easy to breed and there is a large market for the output in Europe and America (Zhao, 2013).

It appears that many operational considerations have not been calculated or taken into account during the five years that the project has been negotiated and constructed, as seen in Table 5, where output quantities and output markets are still to be determined, where only loose plans are in place for output markets. However, it appears that this is often overlooked in the implementation and construction of these demonstration centres.

The memorandum of understanding for a demonstration centre established by the Chinese in Senegal had no set plans on how the output from the centre would be managed (Buckley, 2011). The result was that firstly, the local appointed government workers and Chinese experts were left to sort these issues out on the ground level amongst themselves. The consequence was that once the farm had been operational for a short period, the Chinese

abandoned their objective of training and started commercial production, selling the output in the local markets (Buckley, 2011). “The Chinese come with all the equipment they need. What they have, they keep to themselves. And then they use our land and our water, and they sell their produce. They should be giving it to us! What they are doing, its theft.” (Buckley, 2011, p.18).

Table 5 Land Use, Production Base and Output market comparison table before the acquisition and after the acquisition (Song, 2013 b; Koen, 2013; Zhao, 2013; Visser, 2013; Song, 2013 a)

	Before Acquisition	After Acquisition
Land Use	Inland Aquaculture	Inland Aquaculture focusing on technology transfer, training and research
Input Market	Caught from Gariep Dam and supplied from the University of Limpopo	Originally proposed that China would supply the fingerlings now they will be obtained from University of Limpopo
Production Base	Sharp tooth Catfish, Common Carp, Large mouth yellow fish, Small mouth Yellow fish	Species proposed to be bred immediately are: Sharp tooth catfish, Mozambique Tilapia, Common Carp, and Goldfish. However, other oriental and indigenous species may be produced in the future
Output Quantity	Capacity to produce 150 000 fingerlings per annum, however actual output was 30 000 fingerlings per annum due to the high concentration of chlorine in the water supply and lack of human resources	Quantity still to be established based on the species to be bred. The facility has the capacity to produce 20 million species per annum
Output Market	Private farm water bodies to grow out for food, stocking municipal sewage dams throughout Free State Province, release into rivers to assist in increasing population numbers, research on culture protocols for indigenous species	The fingerlings will initially be used to stock all the outside ponds on-site. There are no set plans for the remaining output. However, it is anticipated that the Department of Agriculture will purchase the fingerlings and sell to the beneficiaries of the community fish ponds at a reduced rate. In addition it is proposed that the remaining output will be sent to the fish processing plant in Orangekrug Town.

The Free State Department of Agriculture and Rural Development has additionally initiated six fish projects with a capacity of 78 fish tanks for the production and grow out of fingerlings (Department of Agriculture and Rural Development, 2013). The project has subsequently been expanded to seventeen projects throughout the Free State. This initiative was created in-line with the National Policy for the development of sustainable inland aquaculture sector in South Africa (Department of Agriculture, Forestry and Fisheries, 2003). This initiative was created in order to ensure that the Gariiep Hatchery fulfils its mandate effectively, in terms of technology transfer (Department of Agriculture and Rural Development, 2013). In addition, it is anticipated that the beneficiaries, the communities who live within the towns where the projects will be established, will obtain training and assistance from the centre (Song, 2013 c). In addition, as per Table 5, a portion of the output from the agricultural demonstration centre might be used to stock these community fish ponds.

These projects are being managed by Econofish Industries (Pty) Ltd, on the Free State Department of Agriculture and Rural Development's (FSDARD) behalf. These projects will be managed by a representative from the community, on behalf of the community in which the ponds are established (van Der Linde, 2013). These towns include: Springfontein, Koffiefontein, Bethulie, Petrusburg, Zastron and Fauresmith (Department of Agriculture and Rural Development, 2013).

Catfish is currently being bred; however Econofish Industries (Pty) Ltd recommends breeding a mix between Tilapia and Catfish as this will increase the growth rate of the species by on average 20% (van Der Linde, 2013). These fish plants can produce on average 30 000 tonnes per annum in two cycles. However, there are currently limited markets where output can be sold (van Der Linde, 2013). The current market is illegal immigrants, mainly from Mozambique and Nigeria, where fish forms an integral part of the diets (van Der Linde, 2013).

In addition, the plans for the establishment of a fish processing plant in Gariiep Town (Orangekrag) have been approved by the Koponong Local Municipality (Moletsane, 2012). Erf number 17-19 have been allocated for the processing plant. These sites are 3595m² when consolidated, however the estimated floor area for the processing plant is 600m² (Moletsane, 2012). The estimated cost to build the facility is R3.5 million (Moletsane, 2012). It is anticipated that the processing plant will receive fish from the community projects as well as

the Demonstration centre, however this has not been finalised yet (van Der Linde, 2013; Visser, 2013). The proposed market for the output from the processing plant is hospitals, schools and police stations within South Africa (van Der Linde, 2013). However, there is a big overseas market for the output, particularly in China, therefore the output will also be exported (Portfolio Committee on Agriculture and Rural Development , 2012).

4.2 Processes

This section evaluates the structure of the land deal and land acquisition process through five subheadings:

- Acquisition Framework
- Land Ownership and Acquisition
- Governance Structure
- Investment Structure
- Environmental Considerations, licences and authorisation

4.2.1 Acquisition Framework

The demonstration centre was one of the outcomes of the Forum on China Africa Cooperation (Song, 2013 b). The forum was held in 2006, in Beijing, where the President of China, Mr Hu Jintao, stated 8 measures in which China can assist Africa. The construction and operation of several agricultural technology demonstration centres throughout Africa, including South Africa, forms one of the 8 outcomes.

The strong and healthy relationship between the Chinese and South African governments in conjunction with the push to increase the inland aquaculture sector, by the South African and Chinese Governments, and the important role China plays in the global aquaculture sector lead to the co-operation of the governments (Song, 2013 b). However, it is understood that the main reason for co-operation is that the Chinese primarily identified South Africa as a possible recipient of a technology demonstration centre (Song, 2013 b).

The co-operation between South Africa and China was initiated in 2007 when the joint statement of intent on economic and technological cooperation was signed between the Chinese and South African governments (Song, 2013 a). Preliminary exchange letters between the Ambassador Extraordinary and Plenipotentiary of the People's Republic of China in South Africa and the Minister of Agriculture and Land Affairs of the Republic of South

Africa were signed in 2008 and 2009 respectively (Song, 2013 a). In addition, an implementation contract, to establish the centre in the Free State, was signed in 2009 by the Free State Department of Agriculture and China National Agricultural Development Group Corporation (Song, 2013 a). The project then commenced in 2009 when the Chinese technicians came to South Africa to initiate the construction of the demonstration centre (Zhao, 2013). Refer to Box 3 for details on the chronicle of events to date at the demonstration centre.

Box 3: Chronicle of events for agricultural demonstration centre

Timeline	Action
November 2006	Chinese Government committed to build demonstration centre
February 2007	Joint Statement of Intent on Economic and Technological Cooperation Signed
June 2007	Project feasibility inspection undertaken and confirmation of site from South African Government
January 2008	Chinese Ministry of Commerce issued construction notes
June 2008	Chinese technicians visited South African to confirm the project site
2008	Environmental Impact Assessment undertaken by Enviroworks
June 2009	Environmental Authorisation granted for the centre
September 2009	Chinese construction team arrived on site
October 2009	Ground breaking ceremony held
January 2011	Project passed inspection undertaken by the Chinese Ministry of Commerce
August 2012	Electricity was provided to the site
October to December 2012	South African Government and Ministries held six site inspections
December 2012	Chinese evaluation team inspected the project
February 2013	Project passed the inspection held by the South African Government and Ministries and a handover certificate was issued
April 2013	Risk assessment for the breeding of alien species commences

4.2.2 Land Ownership and Acquisition

The Chinese will in no part of the project own the land on which the demonstration centre is constructed and operates; it will remain South African property. The land belongs to the Free State Department of Agriculture and Rural Development. The land was owned by the Free State Department of Economic Affairs, Environment and Tourism prior to the acquisition.

The original Gariiep hatchery was under the management and control of the Free State Department of Economic Affairs, Environment and Tourism (FSDEAET) (Koen, 2013). The Free State Department of Agriculture and Rural Development (FSDARD), in conjunction with the China National Agricultural Development Centre, on behalf of the Chinese Government, will now manage and be in control of the Agricultural Demonstration Centre, as indicated in the governance section (Song, 2013 c). The National Department of Trade and Industry has also been involved in the project to some degree, however their involvement has primarily been related to the several agreements established between the Chinese and South Africans, namely (Song, 2013 c; Department of Agriculture Free State , 2009):

- The initial memorandum of understanding between the governments
- Aquaculture action plan
- Joint Statement of Intent on Economic and Technological Cooperation, dated 6 February 2007
- Preliminary exchange letters between the ambassador Extraordinary and Plenipotentiary of the Peoples Republic of China in South Africa and the Minister of Agriculture and Land Affairs of South Africa signed 7 October 2008 and 9 March 2009
- Implementation contract between the Department of Agriculture Free State and China National Agricultural Development Group Corporation signed 10 July 2009
- The Primary Implementation Scheme of the Agricultural Technology Demonstration Centre Project aided by China

4.2.3 Governance structure and Implementation

The Chinese will effectively manage and have control over the facility and finances, with the South African counterparts playing a supportive administrative role, as demonstrated by the information provided in this section. Buckley (2011) identified a similar trend in the Agricultural demonstration centre established in Senegal. The study also found that the

Chinese and Senegalese separated themselves spatially at the centre, with each party working on separate fields, with separate labour and separate revenue streams.

The Chinese government handed the project over to the China National Agricultural Development Centre to manage (CNADC) (Song, 2013 b). The CNADC is a subsidiary of the state-owned Assets Supervision and Administration Commission of the State Council and is China's largest state-owned agricultural enterprise (China National Agricultural Development Group Co. Ltd, n.d.). The CNADC has appointed a subsidiary, China Agriculture International Development Co Ltd (CAIDCO), as the supervising agent for this project. CAIDCO aims to promote Chinese agricultural technology and management experience through demonstration and assist in the development of international agricultural resources (China Agriculture International Development Co Ltd, 2012).

Phase 1 is the construction phase of the project. The technical study, design of the facility, construction materials and equipment for the facility was provided by the CNADC (Free State Provincial Legislature, 2011). A Chinese sub-contractor completed the facility in 2011, on behalf of the Chinese government. The Chinese sub-contractor was only responsible for the construction of the facility. Phase 1 was supposed to be completed within a year (2010), however due to a number of practical issues, including shipping and transportation issues, the project was not completed (Song, 2013 c).

The South African Government was responsible for issuing work and entry permits for personnel involved in the construction of the project, with the condition that all personnel involved in the construction would leave South Africa once the facility was completed (Free State Provincial Legislature, 2011).

The parties involved have been waiting to start the second phase, the technical cooperative phase, since 2011. However, phase 2 has not commenced yet due to the delay with the finalisation of exchange letters¹⁶ between the two countries, which entails the details regarding the second phase of the project. The exchange letter will consider the duties and responsibilities of South Africa and China and related costs. In addition, other administrative issues, including personnel transfer from the Free State Department of Economic Affairs, Environment and Tourism (FSDEAET) to Free State Department of Agriculture and Rural Development (FSDARD), and the completion of a independent risk assessment for the

¹⁶ The exchange letters have subsequently been signed in November 2013

breeding of alien species have delayed the commencement of phase 2 (Song, 2013 c; Koen, 2013).

Phase 2 will form the co-operation between South Africa and China in order to achieve the mandate of the facility for 6 years. The phase is further broken down into two stages, each 3 years (with a possibility of extension after the 6 years are finished) (Song, 2013 c). Phase 2 will see a project manager, technology officer and a financial officer being dispatched from China. In addition, 9 technical staff will be dispatched from China. The South African Government will provide a deputy manager, administrative officer, deputy technology officer and fill a variety of other positions related to production, laboratory, and research and training (Song, 2013 c). Table 6 provides an overview of the governance structure for the demonstration centre.

Table 6 Governance Structure for the Demonstration Centre (Song, 2013 c)

Human Resources	Nationality	Responsibilities
Project manager	Chinese	Overall operation and management of the centre
Deputy Project manager	South African	Manage and arrange the facility, strategic planning, assistance to project manager
Technology officer	Chinese	Oversee hatchery related issues: In charge of fry production, technology demonstration and personnel training
Deputy Technology officer	South African	Assist with hatchery related activities
Financial Officer	Chinese	Financial planning and monitoring of expenses
Administrative Officer	South African	Ensure all administrative work is completed

The various divisions of the demonstration centre will fall under the governance of the project manager and deputy manager, as illustrated in the organisational structure in Figure 10.

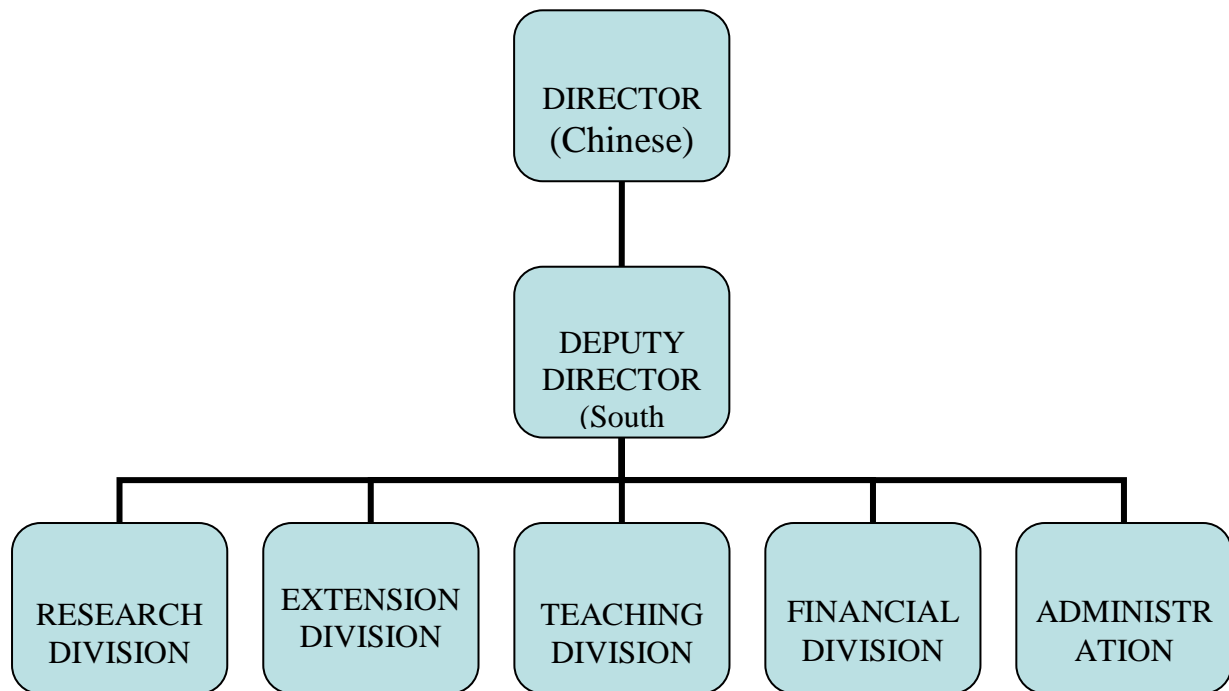


Figure 10 Organisational Structure of the demonstration centre

A project steering committee and project management committee will oversee the project (Song, 2013 b; Song, 2013 c). The project steering committee meet every month and the participants are usually from the FSDARD and the Chinese representatives. The project management committee has been established to discuss the practical issues which arise during the construction and operation of the facility. These committees are responsible for auditing the implementation plan, budget an investment plan. In addition the committees will organise the implementation of the project, carry out inspections and to assess the effectiveness of the project and the feasibility of future expansion and development of the project (Song, 2013 a).

4.2.4 Investment Structure

The Chinese and South African counterparts have invested in the facility, however the majority of the funding has been provided by the Chinese government through the CNADC.

The Chinese Government financed the investment for the construction of the facility to the value of 30 Million RMB, R47 801 746.88 as at 29 July 2013 (Free State Provincial

Legislature, 2011; NCalculators, 2013). In addition to the construction costs, the Chinese government will procure the necessary equipment, furniture, fittings as well as certain operational and management costs (Song, 2013 a). This additional investment will be approximately 23 Million RMB, R 36 648 005.94 as at 29 July 2013 (NCalculators, 2013; Song, 2013 a).

The CNADC will cover all the costs related to the travel and living expenses of the Chinese experts sent to the facility for the first three years of technical co-operation as and when they arise, this includes transport and medical costs (Song, 2013 c; Zhao, 2013).

The South African National Department of Agriculture, Forestry and Fisheries (DAFF) has set aside R6 million for the construction of the facility. DAFF was responsible for all costs relating to the provision of water and electricity at the chosen site (Free State Provincial Legislature, 2011). In addition, all taxes for the importing of construction materials into South Africa were exempted (Department of Agriculture and Rural Development, 2013; Song, 2013 c).

The FSDARD will be responsible for the costs relating to the training, demonstration and research work for the full six years of technical co-operation. In addition, FSDARD will be responsible for the costs relating to the South Africa staff at the centre for the full six years of operation and the costs relating to the Chinese staff for the second three year period of co-operation (Song, 2013 c).

4.2.5 Environmental Authorisations, license and other environmental considerations for the Demonstration Centre

The assessment of environmental aspects will be detailed here, within the framework of South Africa and Free State's policy environment, as provided in Box 4.

Box 4: Aquaculture Policy Environment in Free State

Numerous departments administer the legislation controlling freshwater aquaculture, namely Department of Environmental Affairs and Tourism, Department of Agriculture, Fisheries and Forestry and Department of Water Affairs (Department of Agriculture, Forestry and Fisheries, 2003). The following national legislation applies to freshwater aquaculture:

- The National Environmental Management Act, 1998 (Act No. 107 of 1998)
 - Section 24: Environmental Authorisation
 - Section 28: Duty of Care and Remediation of Environmental Damage
- National Environmental Management : Biodiversity Act, 2004 (Act No. 10 of 2004)
 - Chapter 5 Part 1: Alien Species
 - Chapter 5 Part 2: Invasive Species
 - Chapter 7: Permits
 - Chapter 9: Offences and Penalties
- National Environmental Management: Biodiversity Act, 2004 Alien and Invasive Species Regulations (R.506, July 2013)
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
- Agricultural Pests Act, 1983 (Act No. 36 of 1983)
- Animal Diseases Act, 1984 (Act No. 35 of 1984)
- Animal Improvement Act, 1998 (Act No. 62 of 1998)
- The Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997)
- The National Water Act, 1998 (Act No. 36 of 1998)
 - Chapter 3 Part 4: Pollution Prevention
 - Chapter 4: Use of Water (specifically section 21)
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008)

The following provincial legislation applies to freshwater aquaculture in Free State, in addition to the national legislation:

- Nature Conservation Ordinance 8 of 1969
 - Chapter 3- section 22-29
- Nature Conservation Regulations, AN 184 of 1983
 - Part 3-regulations 10-14

4.2.5.1 Environmental Authorisations and Other Permits

Table 7 details the most pertinent environmental authorisations required to construct and operate a freshwater aquaculture project. The authorisations and licenses, detailed in Table 7, will be discussed further with regard to the South Africa-China Demonstration Centre.

The establishment of the South Africa-China Demonstration Centre obtained environmental authorisation from the Department of Tourism, Environmental and Economic Affairs, Free State, on the 25th of June 2009 (The Department of Tourism, Environmental and Economic Affairs, 2009). The authorisation was granted to the Department of Agriculture; with the authorisation register number EMB/1i, 7, 16/08/267. The authorisation allows the holder to upgrade the existing Gariep Dam fish hatchery to meet the needs of the demonstration centre, within the design and layout principles provided in the authorisation (The Department of Tourism, Environmental and Economic Affairs, 2009).

The authorisation lists various conditions which the holder is to comply with (The Department of Tourism, Environmental and Economic Affairs, 2009). Firstly; the environmental authorisation is valid for a period of two years, from the date of issue- 25 June 2009. The authorisation lapses if the activity has not commenced within this period, and a new authorisation must be obtained. This is the case with the demonstration centre as the authorisation lapsed on the 25th June 2011, while commencement of the activity has yet to take place.

Secondly, the Department of Agriculture was required to submit an environmental audit report, compiled by an independent auditor, once construction activities were completed, i.e. in 2011. The report should contain activity, targets, conformance/non-conformance, performance indicator and comments. However, we were unable to verify the existence of the report or obtain a copy of the report due to confidentiality issues.

Thirdly, an environmental control officer was required to monitor the construction activities during the construction phase of the demonstration centre (The Department of Tourism, Environmental and Economic Affairs, 2009). After various failed attempts to determine the name of the environmental control officer, through a variety of stakeholders, it is unclear whether these requirements were complied with.

Table 7 Freshwater Aquaculture Authorisation Requirements in South Africa (Department of Environmental Affairs, 2011)

Authorisation	Legal Reference	Aquaculture type	Relative timing	Status of Authorisation for the demonstration centre
Environmental Authorisation	National Environmental Management Act and Environmental Impact Assessment Regulations (R544,R545,R546)	All aquaculture activities which trigger activities listed in the Environmental Impact Assessment Regulations	Prior to any activities taking place	Granted on the 25 th of June 2009
Authorisation for use of alien or invasive species	National Environmental Management : Biodiversity Act, the Alien and Invasive Species Regulations and Provincial Ordinances	Any proposed aquaculture activity with an alien or invasive species	Prior to any activities taking place and in conjunction with environmental authorisation	Risk assessment which forms the basis of the authorisation is currently being completed. Therefore no authorisation granted yet
Waste Licensing	National Environmental Management: Waste Act	All aquaculture that trigger the listed waste management activities in Regulation 718 of 2009	Prior to any activities taking place and in conjunction with environmental authorisation	Not required for the demonstration centre
Water Use Authorisation	National Water Act	All aquaculture water uses that are recognised by section 21 of the act	Prior to any activities taking place and in conjunction with environmental authorisation	We were unable to obtain the license, however the basic assessment report refers to the water licence
Other permitting	Various	For all types of aquaculture types as required	Related to inland transport, veterinary matters, product safety. Mostly applicable to activities after environmental authorisation	Permits have not been granted as the activities which require a permit have not been performed

The reasons for the decision of granting the authorisation are listed in annexure 1 of the environmental authorisation. The key factors considered by the Department of Tourism, Environmental and Economic Affairs in granting authority were:

1. The centre will improve the level of aquaculture technology in South Africa
2. The facility will improve the breeding of indigenous fish
3. Auxiliary infrastructure was in place
4. Impacts arising from the operational phase of the project were considered, which includes waste management, storm water management, introduction of alien fish species and surface and groundwater management

A risk assessment must be undertaken and approved prior to the introduction of alien species at the project site, as per the Biodiversity act and others, Table 7, and the environmental authorisation. A tender for the completion of an independent risk assessment is currently out, as the centre intends to introduce Mozambique Tilapia¹⁷, amongst other ornamental fish¹⁸, at the site.

The demonstration centre is not required to obtain a waste license due to the fact that the projected type and quantity of waste generated falls within the general authorisation (Enviroworks, 2009).

The Agricultural Demonstration Centre requires a water license as per the National Water Act, Act 36 of 1998:

- Section 21 a - taking water from a water resource,
- Section 21 b - storing water,
- Section 21 f - discharging water containing waste into a water resource through a conduit.

After numerous attempts to get access to the water license through various stakeholders, this was not achieved. However, the Basic Assessment Report, refers to the water license granted for the demonstration centre and states that the amount of municipal water which will be extracted per month from the Gariep Dam for the fish ponds is approximately 69 559 000 litres (Enviroworks, 2009).

¹⁷ Refer to section 4.1.3

¹⁸ Refer to section 4.1.3

4.2.5.2 Environmental Impact Assessment and Environmental Management Program

The basic assessment report was comprehensive in identifying all activities and impacts, which require a basic assessment or environmental impact assessment to be completed, in terms of regulation GN R386 and GN R387. However, certain activities and aspects lacked sufficient detailing and assessment, as per section 23(2H) found in GN R385, regulations in terms of chapter 5 of the National Environmental Management Act, 1998, which requires a description and assessment of the significance of any environmental impacts.

This is evident by the limited due considerations paid to the aspect of breeding alien species and the impacts thereof (Koen, 2013). For this reason, a new risk assessment is presently being undertaken. The risk assessment is not finalised, however, two specific outcomes have been established at this stage (Zhao, 2013):

- Water treatment purification plants are to be installed for the water which is released from the hatchery
- The diesel tank, illustrated in Figure 7, will be moved underground

The basic assessment report complies with the requirements under the public participation process provided in section 56 of GN R385, regulations in terms of chapter 5 of the National Environmental Management Act, 1998, as the environmental assessment practitioners did place a notice board at a place conspicuous to the public, give written notice to the land owners required and placed an advertisement in the local newspaper (Enviroworks, 2009).

The environmental management plan prepared by Enviroworks (pty) Ltd is satisfactory for a number of reasons. It provides mechanisms which can be used to monitor the environmental conditions on-site, particularly during construction. The plan also provides a mitigation measure, performance indicator and resources and responsibility chart for each aspect and impact identified. An emergency response plan and layout of a typical incident register are provided in the management plan. Lastly, a planting schedule is provided for the relocation of the protected species found on-site, namely the Aloe and Haworthia species.

4.3 Impacts or Benefits resulting from the acquisition

This section focuses on several environmental and social impacts or benefits arising from the acquisition.

4.3.1 Environmental Impacts or Benefits

4.3.1.1 General Environmental Conditions

The environmental authorisation lists requirements to reduce or mitigate possible impacts during the construction, operation and decommissioning of the centre, identified in the environmental impact assessment (The Department of Tourism, Environmental and Economic Affairs, 2009).

According to the environmental authorisation, section 1.25, the holder is responsible to “Rehabilitate denuded areas, especially slopes, with appropriate species and erosion protection measures...” during the construction phase of the activity (The Department of Tourism, Environmental and Economic Affairs, 2009, p.12). Section 1.27 states that “All the areas disturbed during the construction work needs to be landscaped to a similar or better than previously, on completion of the works”. However, as illustrated in Figure 11, this has not occurred on all areas of the site, despite the fact that construction was completed and the site was signed off in February, 2013, as per Box 3.



Figure 11 a. Building rubble lying on site, b. lack of rehabilitation with high soil erosion potential

4.3.1.2 Alien Species

The Mozambique Tilapia can survive in a wide range of temperatures and live in both fresh and salt water ecosystems (Cambray & Swartz, 2007). Thus, the species has a wide natural geographic range which stretches from the Zambezi Delta to Algoa Bay; this species is not endemic to the Orange River (Cambray & Swartz, 2007), however, it has been introduced

into many aquatic ecosystems in Central Africa and South-East Asia (Cambray & Swartz, 2007). Once introduced, this species frequently becomes invasive and dominates the aquatic ecosystem (Trewavas, 1983). Mozambique Tilapia consumes invertebrates, algae, phytoplankton, insects, vegetation and detritus material (Mook, 1983). However, studies have found that the species is also carnivorous, eating fingerlings from their own and other species (Cambray & Swartz, 2007).

Mozambique Tilapia will only be bred depending on the outcomes from the risk assessment, which is currently being undertaken (Song, 2013 b).

4.3.1.3 Water issues

The original hatchery did not have a treatment plant as indigenous fish species were bred (Koen, 2013). The centre has not installed water treatment plants as the risk assessment will determine which plants must be installed in order to ensure that the facility carries out its mandate responsibly. The water treatment plant installed could be composed of a number of technologies to ensure that Tilapia fry's and eggs are not released into the Orange River (Enviroworks, 2009). These technologies are (Enviroworks, 2009):

- Ultraviolet light irradiation
- Heat Treatment
- High-powered ultrasound
- Chlorine, ozone and hydrogen peroxide applications

4.3.2 Social Impacts or Benefits

4.3.2.1 Change in composition of workforce

4.3.2.1.1 Before Acquisition

Rouhani & Britz (2004) found that the hatchery employed ten full-time labourers, either unskilled or with limited skills, at the time of the study. The position of a manager and research assistant was not filled. The staffs at the hatchery were employed by the FSDEAET.

4.3.2.1.2 After Acquisition

A Chinese contractor was responsible for the construction of the facility. The construction team was composed of approximately thirty six labourers and one manager (Mr Chris Lee) from China. In contrast, approximately twenty seven jobs were created for local South Africa residents during the construction phase, which were mainly involved in ensuring that the

electrification of the site and other responsibilities from the South African counterparts were constructed and operational (Song, 2013 b).

The youth leaders in the area were promised that 105 jobs would be created for the local community during the construction and upgrade of the facility; however these promises were not kept. A number of South African's were originally employed during the construction of the facility; however there were difficulties due to communication barrier. This ultimately resulted in Chinese labourers constructing the facility. Buckley (2011) found that this was also the case in Senegal, between the Chinese and local counterparts, during the operation of the facility.

Although the facility is not operational yet, a few jobs have been created for local residents in the landscape arena, 15 employees rotating every three months. A private South African company has been awarded the tender to undertake the general cleaning and cleaning of ponds, since the completion of the construction. There are currently four Chinese counterparts living at the facility; the project manager, interpreter, Chef and technician.

The operational phase will see a project manager (Mr Jao), technology officer and a financial officer being dispatched from China. In addition, 9 technical staff will be dispatched periodically throughout the first three years of operation. Therefore, there will be about four Chinese counterparts employed at any one time in the project.

According to the proposed employment structure, approximately forty three people will be employed during the operation of the project at any one time (including the Chinese and South African counterparts) (Song, 2013 c). The local youth leaders were again promised that 500 permanent jobs would be created for the local community during 2012, it was anticipated that the facility would be operational, however "nothing has come from these promises" (Jonas, 2013)

All of original staff from the existing hatchery will be employed; however their employment will be moved from FSDEAET to FSDARD (Koen, 2013). The staff are currently on-site, however they are not able to work as the centre is not operational yet.

4.3.2.2 Change in working conditions

It is expected that the working conditions at the demonstration centre will not change significantly from the working conditions which were present at the original hatchery, as the South African workers will be subject to the employment contracts set out by the Free State

Department of Agriculture and Rural Development. However, the Chinese will be in control of and manage the centre therefore it is likely that working conditions could change once the centre is operational. The language barrier between the Chinese and South African counterparts is expected to play a big role in altering the working climate and affecting productivity and the desired outcomes of the demonstration centre, as depicted by Brautigam & Tang (2009).

Buckley (2011) identified an unexpected social impact, resulting from the centre, in that the Chinese workers typically got paid more than the local workers, in this case the Senegalese, resulting in tension between the parties. In addition, the Chinese tend to segregate themselves from the local population, when implementing a project, which often compounds racism (Buckley, 2013). These findings could also be applicable to the South Africa-China demonstration centre; however this can only be confirmed once the centre is operational.

4.4 Perceptions of stakeholders regarding changing strategies

This section examines the aspects related to changing strategies of land acquirers, as it is applicable to this case study, and the perceptions and attitudes of stakeholders towards the project and changing strategies of land acquirers.

The Chinese counterparts involved in the demonstration centre are likely to become involved in activities upstream and downstream of primary production due to their role in the fish processing plant and the packaging processing plant¹⁹ as well as their role in the exporting of the output. In this manner, the Chinese will become involved in and possibly manage the entire value-chain from farm to plate.

The majority of the stakeholders are positive about the project and the expected benefits of the project, as long as the centre is run according to the operational plan. The expected benefits from the project are, as anticipated by the stakeholder: job creation, food security and training. One stakeholder feels that investment is beneficial and necessary for South Africa, as long as the Chinese retract their involvement after the required period. “South Africa has to use every opportunity to expand the economy even if we have to use Chinese resources to do so”. Another stakeholder noted that the Gariep District is one of the poorest districts in the Free State, in terms of poverty, unemployment and under development, therefore attempts

¹⁹ See section 4.1.3

to enhance industry in the province is beneficial. “As long as a beneficial partnership can be formed so that it can improve the lives of South African’s”.

Stakeholders are not positive about the project because it has not started operating yet, therefore it has not been beneficial yet. In addition, there are concerns that employment promises, which were made, will not be kept. Stakeholders are also concerned that a significant amount of market development needs to be undertaken, as freshwater fish breeding is relatively new to South Africa. All ‘non-key’ stakeholders were worried that the centre would become a ‘white elephant’ with significant amounts of money wasted.

The stakeholders have a number of concerns about the centre; in particular when and whether the centre will start operating, the breeding of alien species, the affect the effluent released into the Orange River will have on aquatic ecosystems and the fact that the project is perceived to not be transparent. “There wasn’t a cohesive agreement (between the governments) before the project was started and that is one of the main problems with this project. The details of the project will be determined after the construction of the project before the project starts operating. This is a very dangerous clause as the Chinese have built it and can then have greater influence on the outcomes of the project’. The ‘non-key’ stakeholders are worried about the real intention behind the investment. One ‘non-key’ stakeholder feels that the investment gives the Chinese a hold over the South African government.

Stakeholders were concerned that China is not a democracy, does not pay market-related wages and do not respect human rights. In addition, the stakeholders are concerned about the Chinese “taking over”. One ‘non-key’ stakeholder stated that he is cautious about the Chinese investment as the Chinese are only interested in protecting their own interests. However, one stakeholder noted that “The Chinese have a good source of knowledge of freshwater aquaculture to get South African knowledge up to scratch”.

Key stakeholders believe that South Africa was chosen to invest in as it is a country of opportunities, which welcomes investment, with good transportation systems. Various stakeholders also believe that China invested in South Africa as both South Africa and China are part of BRICS. ‘Non-key’ stakeholders feel that South Africa has been targeted as the South African government is unstable and an easy ‘target’ and South Africa is dynamic in terms of natural resources. In addition, these stakeholders noted that China is not only investing in South Africa but the whole of Africa.

The majority of the stakeholders feel that China is benefitting from the acquisition; however they are not sure how China would be benefiting. “China will definitely get their pound of flesh, for every dollar they invest they will make sure that they will get more out of it”. Two stakeholders, one ‘non-key’ and one key, feel that China is investing in South Africa in order to get a ‘foot in the door’. “Don’t be naive to think that China wants to help other countries without a benefit”. One stakeholder noted that it could be a long-term benefit rather than an immediate benefit. However, the Chinese representatives believe that the acquisition is purely to demonstrate technologies to assist and advance South Africa’s freshwater aquaculture. "This is a pure assisting project".

Half of the key stakeholders and all of the ‘non-key’ stakeholders feel that China is investing to gain access to South Africa’s natural resources. The reason that the stakeholders feel this way is because they feel that China has scarce land and resources coupled with a growing population and economy. “The Chinese use other countries natural resources for their own developmental needs. China has targeted Africa due to the vast natural resources Africa poses”. On the other hand, stakeholders do not agree with this statement as, in terms of the agreement, the land and natural resources still belong to South Africa. “The Chinese are not the rightful owners therefore I don’t think that the access to strategic resources is an issue”. In addition, the stakeholder believes that China will not gain access to South Africa’s resources due to the extensive laws and regulations around resources.

The ‘non-key’ stakeholders had two additional comments with regard to the Chinese involvement in the demonstration centre. Firstly, that the Chinese sold illegal cigarettes to the local community at Norvalspunt during the construction of the centre. Secondly, the owner of the Bethulie airfield, which is situated close to the centre, was offered R8 million to sell the airfield to the Chinese involved in the centre. "Why would the Chinese want to buy the airfield?"

CHAPTER 5

Discussion and Conclusion

This subsection will discuss the results according to the three new and interrelated facets of land acquisitions. This has been done in the framework of this study according to:

1. The role water and other natural resources play in land acquisitions
2. The 'invisible' nature of land acquisitions
3. New targets for land acquisitions

The legitimacy of expanding the land acquisition definition, in order to incorporate these facets is presented next. This indicates firstly, possibilities for further research on this topic and related to the South Africa-China Agricultural Demonstration Centre as the role of project specific research on Chinese aid projects, in providing legitimate evidence to contribute to the debate on China's engagement in African agriculture is briefly discussed; secondly, an opportunity for recipient countries to remodel this engagement is presented.

5.1 The three new and interrelated facets of land acquisitions

The three facets of land acquisitions and how they relate to the case study and gauge the findings with regard to the hypotheses provided in 1.3 will now be presented.

5.1.1 The role of water and other natural resources in land acquisitions

Land is not the major objective in this project, the centre comprises only 47 hectares, rather the main objective is access to water, due to the fact that this is an aquaculture project, where access to water is vital for production. Since we certainly cannot speak about land grabbing parse, can we speak about water grabbing in this case?

The hypothesis of this study, "land acquisitions are occurring in order gain access to strategic natural resources, besides land", needs to be nuanced. This is largely due to two factors. Firstly, the centre is not operational yet, thus the logistics around the operation has not been defined. Without a history to trend, we are unable to extrapolate the intention and focus of the centre and determine a baseline for future growth. In addition, without data of the actual capacities for production we are unable to accurately predict the impacts of and engagement with natural resources.

Secondly, two aspects provide the framework for the South Africa-China demonstration centre and do not directly relate to natural resource grabbing. On the one hand, the projects fits in the framework of the diplomatic relationship between China and South Africa (Song, 2013). This coincides with the findings by Brautigam (2011) that instead of the popular myth that China is providing aid to African countries in order to gain access to natural resources, China is investing in countries with whom they have diplomatic relationships, regardless of whether the recipient countries have resources or not. On the other hand, the objective of the centre is supposedly on capacity building and research (Song, 2013). As such, each of these agricultural demonstration centres has three requirements: to be sustainable, to attract interest and demonstrate technologies and to train the locals (Brautigam & Tang, 2009). These longer term perspectives are contradictory with a purely resource grabbing strategy.

However, this being said, the effective implementation of the mandates of these agricultural demonstration centres remains questionable as the core objectives –framed under the diplomatic relationship – and the effective implementation of training activities lead to uncertainties around these centres and, subsequently, the possibility of resource grabbing being disguised. Several points can be developed here.

Firstly, the extent to which the South Africa-China Agricultural Demonstration Centre meets the mandates set can only effectively be established once the centre is operational. Experiences from other demonstration centres indicate that these mandates are not continuously enforced throughout the life of such centres. This failure to effectively implement the mandates of the demonstration centres initiates the idea that the mere existence of the centre justifies China's commitment to providing agricultural assistance (Gabas & Goulet, 2013). As such, the memorandum of understanding for the South Africa China centre was only recently signed between the two respective governments and only the Chinese manager and interpreter were involved in establishing the memorandum. None of the South Africa counterparts which will be involved in the centre on the ground were incorporated in the creation of the memorandum. In order to implement the mandates of the agricultural demonstration centres, the memorandum of understanding between the host government and China needs to be robust and developed by those involved in the project on the ground (Buckley, 2011). The memorandum needs to assign agency for the activities and clearly indicate the respective roles of those involved in the project (Buckley, 2011). A clearly laid out memorandum of understanding would assist in preventing communication barriers and cultural misunderstandings which follow from a poor project design (Buckley,

2011), and would also allow a more co-constructed – and diplomatic - initiative. As developed now, China will have total control over the project, giving it the room of manoeuvre to (re-)orient its strategies, activities, and outcomes – allowing the (Chinese) management to use South Africa’s resources at will. This is re-enforced by the fact that agricultural projects implemented in Africa by China lack a post-project follow-up to determine the natural resource use patterns and the sustainability of the project (Gabas & Goulet, 2013).

Secondly, and this relates to the training aspect, the effective activities should be assessed in the framework of the project’s objectives. As with the South Africa China centre, the research conducted at these centres is not collated to the research undertaken by the national agronomic research organisations of recipient countries and the institutions work independently rather than collaboratively (Gabas & Goulet, 2013). The majority of the training which will occur at the South Africa-China centre will focus on the elite actors, who are already successful in the agricultural arena. Buckley (2013) found that this reduces the efficacy of the mandate of the centres, and leads to unintended social impacts. The emerging farmer and community training undertaken by the centre will be limited to twelve group sessions around the country during the three years the Chinese technicians will be present at the facility²⁰, no training has been undertaken at the centre to date. This again is confirmed by other Chinese case studies: Gabas & Goulet (2013) found that less than one hundred local people have been trained in Senegal by Chinese experts since 2006.

In addition to the limited training, the outcomes from the training, required by the community, are not considered in determining the content of the programmes and centres activities. The various state-owned Chinese firms, responsible for the establishment of the demonstration centres, are not accountable for content of the training provided under the mandate of demonstration centres (Gabas & Goulet, 2013). Recipient governments of the centres have little control over the content of the training programmes (Gabas & Goulet, 2013).

The programmes also lack assessment; therefore these programmes meet the strategic needs of the centre and do not necessarily benefit the community (Gabas & Goulet, 2013). This is relevant in context of the South Africa-China demonstration centre, as the key targets from the centre are the emerging farmers, majority of which do not have access to advanced

²⁰ Refer to Appendix 3

technology and production techniques, which are prevalent at the facility. This introduces the idea of redundancy in terms of the outcomes from the training for community members.

The Chinese technicians, who will be working at the centre, speak a limited amount of English and none of the other 10 official languages of South Africa, reducing the effective implementation of the centre's mandates. They will only be facilitated by one interpreter. The efficacy of Chinese aid and development efforts are reduced by cultural conflicts of language, religion and work habits (Buckley, 2013; Gabas & Goulet, 2013). It has been widely agreed that the lack of communication, due to the language barriers, is one of the largest hurdles to overcome in Chinese aid projects in Africa (Buckley, 2013).

Although the South Africa-China demonstration centre is linked to training and diplomatic relationships, the mandates of the centre are poorly implemented, thus allowing China to gain access to water and other natural resources. It remains difficult to pinpoint the role that water and other natural resources play in land acquisitions. However, trends indicate that virtual access to water resources is occurring (Jagerskog et al., 2012; Woodhouse & Ganho, 2011). The importance of water resources, particularly in the future under concerns about climate change, warrants the continuous monitoring and management within land acquisitions. The access to water in land acquisitions, the virtual water trade and output markets create conditions where land acquisitions are thus increasingly 'invisible' in nature.

5.1.2 'Invisible' nature of resource acquisitions and control

The establishment of the agricultural demonstration centre lends itself to further interventions in the production value-chain, which may have been a factor attributing to the Chinese investment. This provides evidence to the hypothesis that the structure of land acquisitions is becoming increasingly 'invisible' due to the engagement in upstream and downstream production activities, rather than purely the land itself.

Beyond the direct acquisition of natural resources, mainly of water in this case as described in the previous section, agricultural demonstration centres were established as part of a planned intervention to create profitable opportunities for their own companies in Africa, through the provision of agricultural technology and seed cultivation to African markets (Brautigam & Tang, 2009). This can be supported by the fact that the Chinese attempted to provide the fingerlings to be bred in the hatchery, and thus be engaged in upstream activities of the centre; however due to South Africa's environmental legislation this was abandoned. Subsequently, the Chinese have proposed to establish and implement a feed processing plant

to supply food stock to the fingerlings in the centre. Negotiations are currently underway with regard to this matter.

The ‘invisible’ nature of acquisitions and control can also be portrayed through the use of the natural resources and the final production. Indeed, it remains questionable, and it appears to be dependent on the centre itself and the agreements in place, regarding the fate of the output from these centres during the time period which the Chinese are operating the centre. The results from this case study indicate that the memorandum of understanding does not indicate where the output from the centre will be dispatched. The memorandum should have included an agreement on the fate of the produce.

There is a possibility that the output will be exported, via the processing plant which is being established in Orangekrag. Various other studies have found that most production from China’s engagement in African agriculture is not currently exported, as Chinese investors see little point in producing staple crops in Africa and exporting them to China (Brautigam, 2011; Buckley, 2012; Gabas & Goulet, 2013). However, a study undertaken on the Ethiopia- China agricultural demonstration Centre found that the output from the centre was focused on the export markets (Brautigam & Tang, 2012). It appears that output will be exported, from Chinese aid projects, if a European market exists (Gabas & Goulet, 2013).

The output quantity has only been theorised, therefore the actual supply versus demand to the available market in South Africa has yet to be defined. The decision to introduce tilapia is based on international demand, namely European, American and Chinese. More so, the perceptions around tilapia in South Africa are unfavourable. The output capacity is theorised to be up to 20 million fingerlings per annum, with a poorly established market in South Africa. This abundance has led to the feasibility of a processing plant (cannery), with the idea of exporting any market excess, thus the Chinese are attempting to establish downstream enterprises from the centre.

The Chinese are willing to control the larger value-chain related to the production from the South Africa-China demonstration centre, giving China a foothold into South Africa. This is also evident by the other case studies identified during the duration of the project²¹. Agricultural development in Africa is viewed by China as a mechanism to move into other domains, particularly infrastructure and mining and granting loans for development, in

²¹ Refer to Appendix 1

recipient countries (Gabas & Goulet, 2013). As well as a showcase, on the international platform of, Chinese agricultural technologies and development models (Gabas & Goulet, 2013). It also serves as a re-affirmation of China as an emerging economy, within the wider multilateral economic system, in order to defend their economic interests (Gabas & Goulet, 2013).

5.1.3 New targets for land acquisitions

An increase in land acquisitions in developed and emerging economies which are generally more stable and have democratic governance structures in place has been observed, while there has been a noted slowdown in land acquisitions in other parts of Africa (Anseeuw et al., 2012). This South Africa-China project is a good example of the former. In addition, during the implementation of this research project, four additional land acquisitions and investments by the Chinese in South Africa occurred.

Key and 'non-key' stakeholders for this study had varying opinions as to why South Africa was chosen for the development of the centre. Key stakeholders believe that South Africa was mainly chosen as both parties were members of BRICS and that South Africa welcomes investment. , 'Non-key' stakeholders feel that South Africa was targeted as it is a stable country, with a significant amount of natural resources.

Developed and emerging countries are increasingly targeted in land deals as the preconditions for assistance, such as secure land tenure and governance, are typically in place. In addition, a study undertaken by Buckley (2013) found that China's assistance in African agriculture would be more suitable to assist African government policy reform, to create strong markets, education and government transparency prior to technology transfer. "The preconditions are not yet in place in Africa to be meaningfully helped by China. There are still major barriers in terms of governance, infrastructure, irrigation, market structure and land tenure" (Buckley, 2013, p.17). Advanced technologies implemented in these aid projects are also typically more suitable and accepted by the local communities in emerging markets, making them increasingly viable targets for land acquisitions. Poor project design, is also criticised when determining whether Chinese technology is appropriate for Africa or indeed whether China's development experience is suitable to Africa (Buckley, 2013). These technologies or the developmental framework applied in China is not adapted to account for the local conditions or development situation in Africa (Buckley, 2013). "Africa doesn't understand China, and

China doesn't understand Africa" (Buckley, 2013, p.16). There is an ever-present and vast vacuum between the Chinese and African agricultural systems (Brautigam & Tang, 2009).

These observations do not mean China is not interested, or even less is not investing, in other African – and less developed - countries. The South African cases show a renewed strategy towards emerging and more secure investments sites, and could act as stepping stones into other African countries.

5.2 Questioning the land acquisition definition, future studies and final words

As indicated by this research, future possible expansion of the land acquisition definition is required to account for the multifaceted land deals which are increasingly occurring. This is evident from this research where water and other natural resources have the potential to play an increasing role in land deals, particularly through virtual water trade, specifically where land is not the main objective of these deals. Furthermore, this research also highlighted the role that the Chinese play in the entire production value-chain of the demonstration centre, despite the fact that they do not own the land, on which the centre is built, themselves. The increasing number of Chinese backed agricultural investments in South Africa indicates that new targets are being sought after, and as in the case of South Africa, despite the political nature of land, land rights are generally secure and where effective human rights legislation exists. Therefore, the land acquisition definition is too limited. The current land acquisition definitions focus on the violation of human and tenure rights, disregard for social and economic impacts, ineffective independent oversight and participation and the conversion of land (International Land Coalition, 2011; Anseeuw et al., 2012). These definitions do not fully consider the following aspects – mushrooming from this research project:

- That land deals are not only about the land itself
- That developed and emerging economies are increasingly targets for land acquisitions, where tenure is typically secure
- That land deals can also involve “production control grabbing” – without effectively (or visibly) acquiring the resources

Definitions which consider these aspects will take into account situations where natural resources, other than land, warrant the inclusion in the land acquisition definition. Where, output and control of the land and its production becomes as important as ownership of land.

Finally, where secure property human rights issues are not the main concern in land deals, where other concerns like environmental sustainability could be more pertinent.

Several options for future research in this arena exist. These options were not included within the framework of this research for two main reasons; firstly, due to time constraints and secondly, the South Africa-China centre has not started operating yet and the other case studies were only identified during the course of this research. These options for further research are:

- Similar research performed on the other case studies, which were identified in South Africa
- Follow-up research on the South Africa-China Agricultural Demonstration Centre once the centre is operational allowing the researcher to determine whether the operational plans and original intentions, particularly with regards to output markets, are followed
- Comparative studies between the operation and implementation of Chinese Agricultural Demonstration Centres in various African countries
- A critical evaluation of the outcomes of the training, demonstration and technology transfer provided by the China-South Africa agricultural demonstration centre

Extensive literature has studied Chinese involvement in African agriculture, however several knowledge gaps exist (Buckley, 2011). A noted lack of direct engagement with the Chinese actors on the ground, in these land investments, exists in literature (Buckley, 2011; Gabas & Goulet, 2013). This results in vague generalisations and understanding about these investments (Buckley, 2011). These vague generalisations presented the precursor for the research undertaken on the South Africa-China demonstration centre and the resultant findings thereof.

In conclusion, it seems relevant to end this work with a broad reflection on China's engagement and aid for Africa. Chinese leaders believe that the aid provided is beneficial to the world, through the potential to address food security concerns while leading to a revival of developing countries, particularly in Africa (Buckley, 2013). China aims to provide a more 'profitable option' of aid to African after the unsuccessful attempts of the West to raise living standards and increase employment (Brautigam, 2011). However, information on China's aid is generally not transparent, which is especially problematic, given that China's agricultural

sector has an environmentally and socially higher impact (Buckley, 2013), while African governments are also accustomed to countries providing aid with higher environmental and social standards than their own (Brautigam, 2011).

The image of China's engagement in African agriculture is portrayed by two contrasting views (Brautigam & Tang, 2009). Firstly, in China the engagement is portrayed as the acts of a 'socialist brother' or 'capitalist friend'. However, the rest of the world views the broad and strategic engagement as a threat, particularly with regards to the 'land grabbing' discourse (Brautigam, 2011). This study found that the majority of the stakeholders are positive about the project, provided the centre is run according to an approved operational plan. The main concerns with the centre are that it is not operational yet and that market development around the promotion of aquaculture as a food source has not been undertaken in South Africa, possibly reducing the effectiveness of the centre. In addition, concerns have been raised around the use of alien species in the centre for demonstration purposes. However, Gabas & Goulet (2013) found that agricultural demonstration centres were viewed negatively, once they were operational, for a number of reasons; shortcomings in the management of the centre, limited interaction of the Chinese technicians with local people and sliding markets. China's interaction with agriculture in Africa is seen as imprecise and complex to grapple (Gabas & Goulet, 2013).

In any case, "China is now a powerful force in Africa, and the Chinese are not going away. Their embrace of the continent is strategic, planned, long-term and still unfolding. China's rise in Africa is cause for concern among those who care about development on the continent. But this concern has more to do with the standards of companies and banks from a country where capitalism is still relatively raw and where corporate social responsibility is rudimentary at best" (Brautigam, 2011, p.7).

The legitimacy of this concern can only be confirmed or denied based on project specific research of Chinese aid. Project specific research will assist in shedding light on many hypothesised but largely unanswered questions related to production, output markets, social and environmental impacts, which will assist in providing transparency and justifiable reasons behind concerns for agricultural aid provided by the Chinese.

Ultimately it is dependent on the Chinese aid recipient countries, like South Africa, to negotiate foreign direct investment into agriculture (and other sectors) and to shape and re-

model the engagement into agricultural development, in order to benefit the local communities and minimise the environmental and social impacts thereof.

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Appendix

Appendix 1

Additional Chinese Land Acquisition Projects in South Africa

Chinese Pomelo Outgrower Scheme in Bizana²²

This project was initiated when the Alfred Nzo Development Agency was looking to promote small businesses and develop the region through trade promotion. The needs of the district in developing agriculture to benefit the local economy, trade promotion and smallholders were identified. With this in mind, Chinese partners were attained which were at that time looking for smallholders abroad to cultivate food for China. South Africa was identified as it has an established and organised agriculture sector. Various products were considered for the export market; however Chinese were interested in citrus and specifically pomelo, which is indigenous to Asia. This idea of co-operation was initiated in 2009.

Pomelo fruit has been popular in the Asian markets since the 1970's. However, pomelo has recently been introduced into many new markets, resulting in a further increase in demand and therefore outgrowing the supply substantially, thus making the Pomelo a promising business venture (CBI Market Information Database, 2009).

A new cultivar of pomelo has been developed by a University in China, which would provide it to South Africa to be used for production. The new cultivar fetches a higher price and has a niche market. The South African output would find a niche market due to the fact that harvesting would take place 'out of season', therefore a higher price can be fetched. South African output would be harvested in March and April.

Pomelo would be organically grown so resource-poor farmers could participate with relatively low inputs. The time to harvest is three years. A lemon tree could be used as mother stock and graft onto it. The cultivation area is established like a village, usually in an existing village, so each smallholder has their own plot; however cultivation occurs as a group. This encourages competition between the growers. Therefore the land would remain

²² The information in this case study was collected during an interview with Nandipha Bam which took place on the 17 of June, 2013 at Mount Aliyff

communal. Intercropping can occur on the plots, which assists in achieving food security, so land not used solely for pomelo output. In addition, a packing shed would be established which could be run by the growers or independent consultants. In the packing shed one machine is used to wash and polish Pomelo, this is the only mechanisation. It would then get sorted according to sizes (grade). Pomelo, except those for the gift market, is packaged in bags and vacuum sealed and then placed in bags.

The first phase was for South Africa to supply the pomelo as is as raw material to China, exported through Durban Harbour. This is a viable option as the fruit stays fresh for six months without refrigeration. The second phase would be to add value producing pomelo juice, rind for cooking and tea, oil from leaves for essential oils.

900 trees can be planted in one hectare. One tree produces about 20kg, with one pomelo weighing on average 1 kg. The first harvest can occur after 3 years, where 40% output can be expected, after 4 years 60% can be expected and after 5 years 100% can be expected. Income was estimated to be about R50 000 per hectare. A price would be negotiated with the Chinese company. The price would be divided: a portion to the grower, about 70%, portion to the packing shed and then remainder to development agency used to pay local extension officers. A farm gate price can be negotiated with the buyers where produce would be collected at farms and logistics would be paid by buyer from farm to harbour and shipping.

An initial pilot area of 500 hectares was identified at Bizana, Eastern Cape. The pilot area was a success the project would be expanded to 10 000 hectares. The area was identified by the Alfred Nzo Development Agency taking climatic conditions and soil tests into account.

Two technical experts from China would come in for the first phase. Their role would be to work with the master trainers and build technical skill. It will be under South African Management. The Farmers will manage their output with assistance from the extension officers and Chinese experts.

The Alfred Nzo Development Agency would assist the farmers to gain funding for phase 1 and 2. Funding could be sought through the South Africa-China agreements as well as through various Chinese institutions which provide funding for agriculture.

A preliminary off-take agreement was signed between the development agency and Africa Trading Hall, a privately owned company registered in China, to supply the output for 10 years. Africa Trading Hall is currently importing flowers, seafood and wine from South

Africa. The company is active in South Africa and knows the market well. However, the project has not started yet and it is uncertain when and if it will go ahead, due to a number of challenges encountered.

A nursery was to be established in Bizana to establish the stock however the agricultural restrictions and protocols in South Africa prevented this from occurring. Tissue culture was going to be brought in for this specific cultivar. However the protocol states that if plant material is brought into South Africa it has to be quarantined for 3 years and tests conducted on this material for a citrus disease, green cancer. Once released from quarantine the plant material would go to Uithenage to the Citrus research institute to be propagated in order to obtain the mother stock. This process would take 1 year and then once the trees are produced would get 50 000 trees per year, keeping in mind that 500 000 trees would be required per year for 500 hectares. This entire process could take up to 14 years to complete. In order to overcome these challenges, the Chinese offered to bring the tissue culture into South Africa from the lab with the relevant certificates. Alternatively, China could propagate in China with facilities which produce 3 million trees per year. However, neither of these solutions is acceptable in terms of South Africa's agricultural protocols.

Proposed solution to challenges: A committee of the relevant organisations between South Africa and China is established to oversee the process. The Chinese propagate and conduct spot tests for green cancer (a disease which comes from China in citrus). The lab in China and nursery can conduct spot tests. 1 year old trees would then come into South Africa in liquid solution and be quarantined for a period to conduct spot tests. The trees would then be taken to the nursery in Bizana and grafted onto lemon trees. The project requires political intervention to go ahead. In the meantime, the Chinese company is getting restless and are considering establishing a partnership with Mozambique.

The project has had some criticism as the project was not understood and facts were not correct- news articles (like claims of exporting to US). Farmers in Fort Beaufort were against the project due to fears of green cancer spreading to the citrus in that area.

Ostrich Farm

In addition, Brautigam & Tang, (2009) reported that the China State Farm Agribusiness Corporation, a subsidiary of the China National Agriculture Development Corporation, was

planning to implement a co-operative ostrich project in South Africa. However, we are unable to confirm or deny this statement, due to a lack of information.

Val de Vie Wine Estate

South African wine is placed in the top wine lists from abroad, thus raising the appeal of South African wines around the world. “Demand is enormous, interest in South African wines is untainted by historical perceptions and quality is revered.” In fact, the packaged natural wine exports to the Chinese market grew by 56% during 2007-2011, the highest growth experienced during the period (Uren, 2012). Despite this substantial growth, the Chinese provide a boundless potential for South African wines (Noppe, 2012).

Perfect China, based in Yangzhou, acquired the 25 hectare Val de Vie wine estate in August, through its 51% shareholding in Perfect Wines. This represents China’s first investment in South Africa’s wine industry. The purchase price has not been revealed (Ambassade De France en Afrique Du Sud, 2013). The 25 hectare estate contains 21hectares of vineyards as well as a manor house dating to 1783. The cellar facilities at the estate will be expanded in order to increase production and maturation capacity (Ambassade De France en Afrique Du Sud, 2013).

Perfect Wines South Africa was officially created in 2011 as part of an initiative to increase exports of South African wine specifically to the Asian markets (Phakathi, 2013). Relationships were built up and established for an eight year period before the incorporation of Perfect China, the second largest direct sales organic product company in China. Perfect china has over 5000 outlets and 1 million agents throughout China. Relations with a shareholder in Perfect China, Mr Hu, started three years ago after various visits to South Africa (South Africa Info Reporter, 2013).

In 2012 2.8 million bottles of wine were exported to China through Perfect China. In 2013, 1.4 million bottles have been exported to China under the brand “the Huguenot” (Phakathi, 2013). Exports to the Chinese market have risen by 34% from 2009-2012. Exports have increased by 53% in the first 6 months of 2013. The acquisition of the Val de Vie wine estate will allow Perfect Africa to further strengthen its brand in China (South Africa Info Reporter, 2013).

Appendix 2

Questionnaires for Key Stakeholders

Key Stakeholders Interview Guidelines- Department of Water Affairs

Project

1. Are you aware of the species which will be bred at the demonstration centre?
2. Are you aware of the output quantity from these species?

Processes

1. In your opinion was the public participation for the basic assessment report effectively undertaken?
2. In your opinion is the basic assessment report adequately undertaken, particularly in terms of water aspects:
 - a. All impacts and benefits recognised
 - b. Project alternatives
3. How will the demonstration centre affect the Department of Water Affairs, in terms of the protection of water resources?
4. Does the demonstration centre have a valid water license?
5. If so, how can I obtain the license?

Strategies

1. In your opinion what does China gain from the deal?
2. Why do you think China chose to invest in South Africa?
3. Why do you think China chose to invest in aquaculture in South Africa?
4. Why do you think China chose the Gariep Dam Hatchery to invest in?
5. How do you feel about the statement that China is investing in more than merely land but rather investing in South Africa to gain strategic access to natural resources like water?

Impacts

1. Will and, if so how, will the demonstration centre affect the water resources downstream of the centre?
2. How much water will the centre be allocated?
3. What are the projected impacts from the species which will be bred on the water resources?
4. Does the department of water affairs have any concerns with the technology which will be used to breed and grow-out?

Perceptions and Attitudes

1. Do you think it was necessary for South Africa and the Free State to have this centre?
2. Do you have any concerns regarding the project?
3. If yes, what are they?
4. How do you envisage this centre assisting South Africa?

General

1. Why do you think there has been so much controversy regarding the project?
2. Is there some-one else I should contact?

Key Stakeholders Interview Guidelines- Nature Conservation Representative

Project

1. Are you aware of the species which will be bred at the demonstration centre?

Are you aware of the output quantity from these species?

Processes

1. In your opinion was the public participation for the basic assessment report effectively undertaken?
2. In your opinion is the basic assessment report adequately undertaken, particularly in terms of water aspects:
 - a. All impacts and benefits recognised
 - b. Project alternatives
3. Does the demonstration centre have all the required licenses and authorisations?

Strategies

1. In your opinion what does China gain from the deal?
2. Why do you think China chose to invest in South Africa?
3. Why do you think China chose to invest in aquaculture in South Africa?
4. Why do you think China chose the Gariep Dam Hatchery to invest in?
5. How do you feel about the statement that China is investing in more than merely land but rather investing in South Africa to gain strategic access to natural resources like water?

Impacts

1. Do you have any concerns with the production process?
2. Do you have any concerns with the species to be bred?
3. What are the projected impacts from the species which will be bred on the aquatic environment?
4. Do you have any additional environmental concerns with regards to the demonstration centre?

Perceptions and Attitudes

1. Do you think it was necessary for South Africa and the Free State to have this centre?
2. Do you have any concerns regarding the project?
3. If yes, what are they?
4. How do you envisage this centre assisting South Africa?

General

1. Why do you think there has been so much controversy regarding the project?
2. Is there some-one else I should contact?

Key Stakeholder Interview Guidelines -Department of Environmental Affairs representative

Background

1. Can you give me some background on the Gariep Dam Hatchery before the construction of the demonstration centre?

Project

1. What will be produced in the hatchery?
 - a. Species
 - b. Why were these species chosen to bred and research?
 - c. Quantity
2. Can you explain the production process?
3. What happens to the output fish? Is it sold to the local or foreign market?
4. Are you aware of the processing plant proposed to be established in Gariep Town?
5. Are the Chinese involved in this processing plant?
6. Are you aware of the six small fish ponds established in Springfontein, Trompsburg etc.?
7. Are the Chinese involved in these ponds?

Processes

1. Which environmental authorisations and licences has the acquirer obtained? E.g. Record of Decision, water licence
2. Why has the demonstration centre not opened yet?
3. Is a new environmental authorisation being undertaken? (As per Environmental authorisation 2009 if activity does not commence within 2 years a new EA has to be applied for).

Strategies

1. How do you feel about the establishment of the Demonstration centre? Do you think it is necessary and will be beneficial?
2. Do you think it was necessary to have the Chinese as partners in order for this project to be established?
3. Do you have any concerns about the demonstration centre and related activities?

4. Why was South Africa chosen for the establishment of the agricultural demonstration centre/ investment by the Chinese?
5. Why is there an investment in aquaculture in South Africa rather than other agricultural activities?
6. Why was the Gariep Hatchery chosen for the demonstration centre and investment?
7. To what extent do you think does the availability of water and other natural resources play in the investment by the Chinese?
8. What are the Chinese getting from the construction and operation of the demonstration centre? What do you think their aims and objectives are from the centre?

Impacts

1. Which species will be bred at the facility? (Mozambique Tilapia, Catfish and ornamental fish)
2. What is the expected output per annum per breed?
3. What will happen to the fry's? Where will they go?
4. Was it always the intention of the demonstration centre to breed these fish?
5. Why is the centre not continuing with the yellow fish breeding?
6. Is an independent assessor being appointed to undertake risk assessments for the breeding of alien species?
7. Are there counter measures/mitigation measures in place to prevent to release of eggs and fry's into the Orange River System and control thermal pollution and nutrient loading?
8. If no, why was it not installed when the rest of the facility was upgraded?
9. Did environmental monitoring occur during the construction of the facility? If yes, can I obtain a copy of the reports (environmental audit at the completion of the construction phase), if not why not?
10. Who was in charge of environmental matters during the construction? (EMP says construction contractor), who is the environmental control officer?
11. Once the facility is operational will there be monitoring of environmental conditions at the facility and downstream of the facility during construction?
12. How will the environmental conditions be monitored?
13. How will the outcomes of the monitoring be used?
14. How many South Africans and Chinese respectively were employed during the construction?
15. How many South Africans and Chinese respectively will be employed during the operational phase?

16. Do you expect working conditions to change once the facility is operational compared to working conditions before the centre was initiated? If yes, in what way?

Perceptions and Attitude

1. Do you think it was necessary for South Africa and the Free State to have this centre?
2. How do you envisage this centre assisting South Africa?

General

1. Why do you think there has been so much controversy over the hatchery?
2. Is there someone else I should contact?
3. Can I talk to some old employees who have been at the centre prior to the agricultural demonstration centre?

Key Stakeholder Interview Guidelines -Political Organisation

Project

1. Why is the centre not operating, considering it is complete and was supposed to start operating in December?
2. Why do you think there has been so much controversy over the centre?
3. What is going on in the project? What does the project involve? Describe the projected land use?
 - a. What is being produced?
 - b. Quantity per annum
 - c. Production methods
 - d. Where will the products be sold/to who?
4. When was the project started?
5. Who owned the facility before the co-operation?
6. Who owns the facility now?
7. Why has it been taken over?
8. What upgrades to the facility are occurring?
9. Why are these upgrades occurring?
10. How far along are the upgrades?
11. When is the facility expected to be operational?
12. Describe the land use prior to the co-operation?
 - a. What was being produced? Species
 - b. Quantity per annum
 - c. Production methods
 - d. Who obtained the products produced? Where were products sold?

Processes

1. How much has been invested?
2. How is the return on investment structured? (What are they getting for their money?)
 - a. Does the acquirer obtain long-term voting rights in the facility?
 - b. Is the investment a loan?
 - c. Does the acquirer own the facility for a number of years after it has been upgraded/improved – if so where is the outputs sold-local or foreign market?
3. Is there a contract with the investor?
4. When did the idea of upgrading the facility occur?
5. Who initiated the idea of upgrading the facility?
3. How did the idea of co-operation come about?
4. When did the idea of the co-operation start?
5. How was co-operation initiated?

Strategies

1. Why was an aquaculture facility chosen as a vehicle of co-operation?
2. Why was the Gariiep Hatchery chosen for co-operation?
3. What are the aims of the Chinese for establishing this facility?
4. What are the Chinese getting from the deal?
5. Why are the Chinese investing in South Africa?
6. Why are the Chinese investing in the Gariiep Hatchery rather than another state-owned hatchery in South Africa?
7. How do you feel about the statement that the Chinese are investing in more than merely land, they are investing in order to gain access to strategic natural resources, like water? To what extent did the availability of natural resources, other than land, play in the co-operation?

Impacts

1. Which natural resource rights has the facility been granted once the facility is operational?
E.g. Water Rights
2. What is the extent and duration of these rights?
3. Have the natural resource rights granted changed since the facility has been taken over?
4. What are the expected changes in the state of the environment, if any, once the facility is operational?
5. Was a social impact assessment undertaken for the upgrading/improving of the facility?
6. Obtain a copy of the SIA report
7. What are the expected changes in the composition of the labour and working conditions, if any, once the facility is operational?

Perceptions and Attitude

1. Was necessary for South Africa and the Free State to have this centre?
2. How do you envisage this centre assisting South Africa?
3. How do you feel about the Chinese involvement in this project?

General

1. Do you think there is someone else I should contact?

Key Stakeholders Interview guideline- Media Reporters

Project

1. From what I gather in the article the upgrades to the hatchery are complete? Why do you believe that the hatchery has not been opened?
2. Why do you think there has been so much controversy over the centre?
3. What is going on in the project? What does the project involve? Describe the projected land use?
 - a. What is being produced? Species
 - b. Quantity per annum
 - c. Production methods
 - d. Where will the products be sold/to who?
4. When was the project started?
5. Who owned the facility before the co-operation?
6. Who owns the facility now?
7. Describe the land use prior to the co-operation?
 - a. What was being produced? Species
 - b. Quantity per annum
 - c. Production methods
 - d. Who obtained the products produced? Where were products sold?

Processes

1. How much has been invested? How is the return on investment structured? (What are they getting for their money?)
 - a. Does the acquirer obtain long-term voting rights in the facility?
 - b. Is the investment a loan?

- c. Does the acquirer own the facility for a number of years after it has been upgraded/improved – if so where is the outputs sold-local or foreign market?
2. Is there a contract with the investor?

Strategies

1. What do you believe are the Chinese getting in return? What is their return on investment in the project?
2. What do you think the real intention of the Chinese is?
3. Why do you think was South Africa chosen for the establishment of the agricultural demonstration centre/ investment by the Chinese?
4. Why do you think there is an investment in aquaculture in South Africa rather than other agricultural activities?
5. Why do you think was the Gariiep Hatchery chosen for the demonstration centre and investment?
6. How do you feel about the statement that the Chinese are investing in more than land itself, but also other natural resources, like water?

Impacts

1. The article in September states that numerous job opportunities would be provided for South Africans in the project. However, from the second article, it appears that this did not materialise. Do you know how many jobs were created for South Africans and for Chinese?

Perceptions and Attitudes

1. Was necessary for South Africa and the Free State to have this centre?
2. How do you envisage this centre assisting South Africa?
3. What is your opinion regarding the project and the involvement of the Chinese?

General

1. How did you find out about the Chinese involvement and the subsequent upgrading of the hatchery?
2. You state in your first article that the improvements to the facility are to assist in establishing fish farming as an agricultural activity for smallholders. In addition, that the project is to assist with food security. I understand that you obtained this information from the project plans. Where did you obtain the plans?
3. Where do you see this project going? Considering that nothing is happening in the newly constructed buildings?
4. There is a lot of controversy regarding the project; a thread was established on the fly-talk website; why do you believe this is so?
5. You state in your article that this project is a flagship of six aquaculture projects; can you give me more information regarding the other projects?
6. Is there someone else you think I should contact regarding the project, apart from the department?
 - a. Do you have the contact details of the Chinese contractors alternatively do you know how I can get hold of them?

Key Stakeholders Interview Guidelines – Chinese Representatives

Background

1. How are you involved in the facility? What are your roles and responsibilities?
2. Do you work for the China National Agricultural Development Centre?

Project

1. What will be produced in the hatchery?
 - a. Species
 - b. Why were these species chosen to bred and research?
 - c. Quantity
2. Can you explain the production process?
3. What happens to the output fish? Is it sold to the local or foreign market?
4. Are you aware of the processing plant proposed to be established in Gariep Town?
5. Are the Chinese involved in this processing plant?
6. Are you aware of the six small fish ponds established in Springfontein, Trompsburg etc.?
7. Are the Chinese involved in these ponds?
8. Who was the contractor who completed the upgrades to the old hatchery?
9. Why is the demonstration centre not operational yet? (considering it was supposed to be operational in December)
10. Are any parts of the demonstration centre operational yet?
11. Have any farmers been to the facility to ask for assistance and training? Where did they come from? Or has any training been conducted to farmers?
12. What will happen to the research conducted on breeding, technology and seeds at the facility? (Where will it be disseminated?) What will happen to the fry's?

13. How will research be undertaken at the facility and who will be responsible for the research?

Processes

1. How did the idea of co-operation between South Africa and China come about?
2. When did the idea of the co-operation between South Africa and China start?
3. How was co-operation between South Africa and China initiated?
4. What process did China go through to be able to invest in South Africa?
5. Who is the land acquirer? Private or state-owned?
6. Who has financed the project? Is this different from who acquired the facility?
7. How much has been invested?
8. What is the proposed time of investment?
9. Who is in charge of the investment on the Chinese side?
10. How is the return on investment structured? (What are they getting for their money?)
 - a. Does the acquirer obtain long-term voting rights in the facility?
 - b. Is the investment a loan?
 - c. Does the acquirer own the facility for a number of years after it has been upgraded/improved – if so where is the outputs sold-local or foreign market?

Strategies

1. Why do you think South Africa was chosen to invest in? (Especially compared to other countries who do aquaculture)
2. How did China decide that South Africa was a good investment? What were the key factors involved in the decision to establish the demonstration centre in South Africa?

3. Who determined the location of the demonstration centre in South Africa? (the South African government, Free State Department of Agriculture or China)
4. What were the factors considered in determining the location of the demonstration centre?
5. Did the availability of large quantities of water from the Gariep Dam, not for use in the centre, play a role in determining the location and investment?
6. Why do you think that the acquirer was interested investing in aquaculture in South Africa? (Why did China invest in aquaculture in South Africa rather than another type of production activity?).
7. How do you think China is benefitting from the investment in the facility and related activities? What are the aims of China? What are China's desired outcomes from the investment?
8. I understand that the land will remain property of South Africa, so how is the Chinese investment secured?
9. What are the true aims of the Chinese for investing in this project?

Impacts and benefits

1. Has monitoring of environmental impacts and benefits been undertaken?
2. What environmental impacts/benefits have been found from the monitoring?
3. Obtain copy of the reports with monitoring and findings
4. What mitigation measures have been implemented to reduce the environmental impacts from the project/ enhance the environmental benefits gained from the project?
5. Has monitoring of social impacts and benefits been undertaken?
6. What social impacts/benefits have been found from the monitoring?
7. Obtain copy of the reports with monitoring and findings
8. What mitigation measures have been implemented to reduce the social impacts from

9. The project/ enhance the social benefits gained from the project?
10. How many South African's and Chinese were employed during the construction phase of the demonstration centre?
11. How many South African's and Chinese respectively will be employed at the demonstration centre during the production phase?
12. Why was a water treatment plant not installed to treat the water from the hatchery, which goes into the Orange River, when the facility was upgraded?
13. How far is the independent risk assessment on alien species as appointed by the Department of Free State?

Perceptions and Attitudes

1. How will this centre assist Southern Africa?

General

1. Why do you think there has been so much controversy around the hatchery?
2. Do you have any documents that I can use in my project:
 - Joint Statement of Intent on Economic and Technological Co-operation, dated 6 February 2007
 - Exchange letters between the ambassador Extraordinary an plenipotentiary of the People's Republic of China in South Africa and the then minister if Agriculture and Land Affairs of South Africa, signed 7 October 2008 and 9 March 2009
 - Implementation contract between Department of Agriculture Free State and China National Agricultural Development Group Corporation, dated 10 July 2009
 - The primary implementation scheme of the agricultural technology demonstration centre project aided by China (China National Agricultural Development Group Corporation author)
3. Do you think there is someone else I should contact?

4. Are you aware of the project initiated by the China National Agricultural Development Group Corporation in Africa and the China State farm Agribusiness corporation Ostrich Project in South Africa? (Who will have more information on this?)

5. Is the China National Agricultural Development Group Corporation in Africa involved in any more projects in South Africa besides the demonstration centre? If yes, which projects?

Key Stakeholders Interview Guidelines- Municipality Representative

Project

1. Why has the facility not opened yet?
2. Why was the opening scheduled for the end of June postponed?
3. When is the facility expected to be operational?
4. What is going on in the project? What does the project involve? Describe the projected land use?
 - a. What is being produced? Species
 - b. Quantity per annum
 - c. Production methods
 - d. Where will the products be sold/to who?
5. When was the project started?
6. Who owned the facility before the co-operation?
7. Who owns the facility now?
8. Describe the land use prior to the co-operation?
 - a. What was being produced? Species
 - b. Quantity per annum
 - c. Production methods
 - d. Who obtained the products produced? Where were products sold?

Processes

1. How much has been invested?
2. How is the return on investment structured? (What are they getting for their money?)
 - a. Does the acquirer obtain long-term voting rights in the facility?

- b. Is the investment a loan?
 - c. Does the acquirer own the facility for a number of years after it has been upgraded/improved – if so where is the outputs sold-local or foreign market?
3. Is there a contract with the investor?
 4. When did the idea of upgrading the facility occur?
 5. Who initiated the idea of upgrading the facility?
 6. How did the idea of co-operation come about?
 7. When did the idea of the co-operation start?
 8. How was co-operation initiated?

Strategies

1. Why was an aquaculture facility chosen as a vehicle of co-operation?
2. Why was the Gariep Hatchery chosen for co-operation?
3. What are the aims of the Chinese for establishing this facility?
4. What are the Chinese getting from the deal?
5. Why are the Chinese investing in South Africa?
6. Why are the Chinese investing in the Gariep Hatchery rather than another state-owned hatchery in South Africa?
7. How do you feel about the statement that the Chinese are investing in more than merely land, they are investing in order to gain access to strategic natural resources, like water? To what extent did the availability of natural resources, other than land, play in the co-operation?

Impacts

1. Which natural resource rights has the facility been granted once the facility is operational?
E.g. Water Rights
2. What is the extent and duration of these rights?

3. Have the natural resource rights granted changed since the facility has been taken over?
4. What are the expected changes in the state of the environment, if any, once the facility is operational?
5. Was a social impact assessment undertaken for the upgrading/improving of the facility?
6. Obtain a copy of the SIA report
7. What are the expected changes in the composition of the labour and working conditions, if any, once the facility is operational?

Perceptions and Attitude

1. How do you feel about the investment in the hatchery? Do you have any concerns?
2. Was necessary for South Africa and the Free State to have this centre?
3. How do you envisage this centre assisting South Africa?
4. How do you feel about the Chinese involvement in this project?

General

1. There is still a lot of controversy about the project, do you know why?
2. Is there someone else I should contact?

Appendix 3

Questionnaire for 'Non-Key' Stakeholders

Demographic of interviewee

1. How long have you lived in the area?

The Project

1. In your opinion what does the acquirer gain from the deal?

Processes

1. How do you feel about the demonstration centre?
2. Do you have any concerns regarding the project? What are they?

Strategies

1. Why do you think that China chose to invest in South Africa?
2. Why do you think China chose to invest in aquaculture in South Africa?
3. Why did China choose Gariep Dam to invest in?
4. How do you feel about this investment?
5. How do you feel about the statement that China is investing in more than merely land but rather investing in South Africa to gain strategic access to our natural resources like water?

Impacts and Benefits

1. Have you noticed a change in the surrounding environmental conditions (positively or negatively) since the construction of the demonstration centre? If so how?
2. Why do you think there has been so much controversy about the centre?

Perceptions and Attitudes

1. Do you think it was necessary for South Africa and the Free State to have this centre?
2. How do you envisage this centre assisting South Africa?

General

1. Is there someone else I should contact?

Appendix 4

South Africa- China Agricultural Demonstration Centre Activities (Song, 2013 c)

Training and Promotion					
Activity	Details	Groups	Duration	Responsibility	Financial Resources
Course for extension officers and technicians	Freshwater fish biological features, cage culture technology	2 per province	4 months	Key: Chinese experts, Support: Provinces, Department of Agriculture, Fisheries and Forestry	Provinces: Attendees travel, accommodation and training, Chinese Government: Presenter
Short courses for farmers and farm workers	Freshwater fish biological features, cage culture technology	15 in Northern Cape, Free State, North West, Gauteng and Limpopo, 12 in Western Cape, Eastern Cape, Kwa-Zulu Natal, Mpumalanga	2 months	Key: Chinese experts, Support: Provinces, Department of Agriculture, Fisheries and Forestry	Provinces: Attendees travel and accommodation, Chinese Government: Presenter, Department of Agriculture, Fisheries and Forestry: Administrative costs and training costs
Workshops for Government Officials and Academic institutions	Aquaculture development, aquaculture management, policy development and implementation and research and monitoring	Department of Agriculture, Fisheries and Forestry, Academic institutions, aquaculture associations	1 week per quarter	Key: Department of Agriculture, Fisheries and Forestry, Support: Provinces, Chinese experts	Department of Agriculture, Fisheries and Forestry: facilitation, venue and catering, participants to cover all other costs
Student courses	Seminars	30 students per session	1-2 Days	Key: Chinese experts, Support: Academic institutions, Department of Agriculture, Fisheries and Forestry	Department of Agriculture, Fisheries and Forestry: facilitation, venue, accommodation and catering, Institutions: transport

Student courses	Practical on farming techniques	30 students per session	4 days	Key: Chinese experts, Support: Academic institutions, Department of Agriculture, Fisheries and Forestry	Department of Agriculture, Fisheries and Forestry: facilitation, venue, accommodation and catering, Institutions: transport
Specialist courses	Production systems, aquatic weed control, breeding techniques, hatchery management, nutrition, system design, fish health, aquaculture economics and engineering	Government officials, lecturers, veterinarians, consultants, industry, engineers, aquaculturists	1-2 Weeks per course	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Department of Agriculture, Fisheries and Forestry: facilitation, venue, accommodation and catering, Chinese Government: expert costs
Internship programmes	Breeding techniques, hatchery management, On-farm management, nutrition, system design, fish health, water quality, bio-security, marketing, financial management, processing	6 internships available per annum	6-12 months	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry and provinces	Provinces and Department of Agriculture, Fisheries and Forestry to cover all costs
Education and Awareness outreach	Career exhibitions, tours of the facility, information centre	High School learners, farmers, public	As requested	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Schools, Provinces and Department of Agriculture, Fisheries and Forestry to cover all costs

Breeding and technology Demonstration					
Activity	Details	Groups	Duration	Responsibility	Financial Resources
Production techniques	Fingerlings and juvenile production, fish grow-out, testing and improving strains of various fish species	emerging and commercial farmers, researchers, local communities and retailers	various demonstrations provided throughout 3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese Government and Department of Agriculture, fisheries and forestry to cover all costs
Technology demonstration	fish grow-out, vaccinations, diagnosis and treatments, fish harvesting, transportation	emerging and commercial farmers, researchers, local communities and retailers	various demonstrations provided throughout 3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese Government and Department of Agriculture, fisheries and forestry to cover all costs

Research and Development					
Activity	Details	Groups	Duration	Responsibility	Financial Resources
Feeds and nutrition	strategies to reduce feed costs, making feed available to emerging farmers, feed nutrients and quality, feed formulation, algal production, developing cost-effective diets for small scale farming	researchers, nutritionists, research institutions, farmers, agricultural research council, national research foundation	3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese and Department of Agriculture, Fisheries and Forestry to cover all costs
Information management systems	Protocols for feasibility studies, national aquaculture geographical information system to assist with site selection and management of the industry	Department of Agriculture, Fisheries and Forestry, provinces	3 years	Key: Department of Agriculture, Fisheries and Forestry, Support: Chinese experts	Department of Agriculture, Fisheries and Forestry and provinces to cover all costs
Market analysis and development	research into market needs and trends, value chain analysis, research into post-harvest technologies and product development to increase market share	Research institutions, provinces, Department of Agriculture, Fisheries and Forestry, National Research Foundation	3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese and Department of Agriculture, Fisheries and Forestry to cover all costs
Fish health and diseases	development of aquaculture health programme, detection and diagnosis technology, vaccination and medication, quarantine protocols	veterinarians, scientists, research institutions, Agricultural Research Commission	3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese and Department of Agriculture, Fisheries and Forestry to cover all costs

Breeding and genetics	testing and improving strains of fish for aquaculture, breeding technologies, research into genetically modified organisms	veterinarians, scientists, research institutions, Agricultural Research Commission, provinces, Department of Agriculture, Fisheries and Forestry	3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese and Department of Agriculture, Fisheries and Forestry to cover all costs
Production Systems	designing propagation techniques, egg and sperm quality selection for various growth stages, developing a protocol and testing the viability of integrating aquaculture into irrigation schemes	veterinarians, scientists, research institutions, Agricultural Research Commission, provinces, Department of Agriculture, Fisheries and Forestry	3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese and Department of Agriculture, Fisheries and Forestry to cover all costs
Transportation	Anaesthetics, minimisation of stress during transportation	research institutions, commercial and rural farmers	3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese and Department of Agriculture, Fisheries and Forestry to cover all costs
Water Quality	water treatment- parameters, microbial analysis	Research institutions, provinces, Department of Agriculture, Fisheries and Forestry, National Research Foundation	3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese and Department of Agriculture, Fisheries and Forestry to cover all costs

Technology	system designs, technology transfer, post-harvesting technology	Research institutions, provinces, Department of Agriculture, Fisheries and Forestry, National Research Foundation	3 years	Key: Chinese experts, Support: Department of Agriculture, Fisheries and Forestry	Chinese and Department of Agriculture, Fisheries and Forestry to cover all costs
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