A STUDY ON HOW MBONGOLWANE WETLAND NATURAL RESOURCES CAN BENEFIT SOCIETY

Analysis of wetland value chains, ecosystem services and business plan for Mbongolwane wetland resources

Report to the
Water Research Commission

by

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WRC Report No. KV 346/15
ISBN 978-1-4312-0727-5

January 2016

Obtainable from:

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The publication of this report emanates from a project entitled *A Study on how Mbongolwane Wetland Natural Resources can Benefit Society* (WRC project No. K8/1079).

EXECUTIVE SUMMARY

Rationale

Mbongolwane is a large wetland and grassland area located at the headwaters of the Amatigulu River in the KwaNtuli Tribal Authority, one of 14 tribal authorities located in the uMlalazi Local Municipality. uMlalazi is located in the uThungulu District Municipality in the province of KwaZulu-Natal. Rural development is a strategic priority and UThungulu District has been identified for 'investment in rural areas and the revitalisation of smaller towns' (Mathfield, 2013)

uMlalazi, like many distressed Municipalities has a high proportion of young people, high levels of dependency and unemployment, high levels of emigration from rural areas, low education and low levels of services to households. At the same time, the Mbongolwane area has relatively high agricultural potential and is close to large urban markets, for example Durban and Richards Bay. Thus the area surrounding Mbongolwane provides an ideal opportunity to research and implement at a pilot scale various natural resource-based enterprises and their value chains to support local economic development.

This report was prepared as a short-term consultancy to investigate value chains and ecosystem services associated with the Mbongolwane wetland and their potential role in generating rural local economic development in rural areas.

Aims

The overall aim of this study was to investigate the viability of Mbongolwane wetland to economically support the local society through sustainable utilisation of natural resources.

The study has therefore addressed the following specific objectives:

1. To identify main key issues and required interventions to enhance opportunities available in Mbongolwane
2. To Identify and develop value chain opportunities for natural resources or ecosystem services available in Mbongolwane
3. To propose viable market options for Mbongolwane natural resources
4. To develop a viable governance structure for sustainable use and protection of Mbongolwane
5. To develop a fundable business plan/case for five years, and subsequent 10 years for approval by core collaborators.

The overall aim of this study was achieved through the execution of the objectives as outlined in the methodology below.

Methodology

The methodology employed in this study considered both ecosystem services, essentially benefits people obtain from ecosystems and value chains. Note that value chains consider the flow of economic goods and services from inputs and primary production through to value addition, marketing, sales and disposal.

Firstly a literature review of research reports and associated documents relevant to value chains and ecosystem services considering wetlands generally and Mbongolwane specifically was conducted. This was followed by a number of engagements with various stakeholders in the Mbongolwane wetland area, including farmers, crafters, livestock owners, market outlets in Eshowe, the sugar industry, traditional leadership and the agricultural sector. These engagements informed the value chain analyses that were conducted. Stakeholders' perceptions of the importance of the wetland's natural resources were also evaluated during the engagement process. The outcomes of the value

chain analyses and ecosystem services assessment were presented to local stakeholders at two multi-stakeholder workshops to generate business ideas and identify further research needs.

The research that was conducted informed the development of business concepts to support the advancement of selected value chains and ecosystem services associated with the Mbongolwane wetland resource. The study also provided the opportunity for two young graduates to engage in community-based field research and conduct more in-depth analyses than are usually associated with such short-term consultancies. This helped to inform the study in more detail while also developing their capacity as young professionals. Consequently, the exploration of local value chains has been conducted in some detail.

Results and Discussion

Based on initial investigations of natural resources-based activities that had potential for value chain development, the agriculture and craft production value chains were selected for more detailed investigations as these two activities account for the largest economic use of the wetland by the Mbongolwane community. Agriculture included wetland cropping, livestock and sugarcane production around the wetland. From a craft perspective, fibre-based craft as well as other forms of craft were considered in the value chain analyses.

Overall, value chains in Mbongolwane were found to be rudimentary with little or no alignment between value chain players. Apart from sugarcane, there was little or no information on the actual input costs and output values and it was found that there was very little, if any, marketing of agriculture and craft products obtained from the wetland. As a result, the value chain analyses focussed on factors affecting the alignment of local value chains rather than the economic 'value-add' along the chain as this was not sufficiently developed to allow any meaningful analysis. The assessment of value chain alignment considered barriers and regulators that limit value chain development as well as drivers and enablers that can potentially support value chain development as a means of identifying what types of interventions would be necessary to enhance the benefits provided by Mbongolwane wetland to the local community.

From an agricultural perspective, most agricultural production was found to be for subsistence purposes and most challenges were experienced in the input and primary production components of the value chain. This indicates that extension support and training is necessary, as a first step to increase yields. Little, if any value addition was observed during the research. Demand for agricultural produce locally was found to be substantial and this is suggested as the first marketing point for agricultural produce.

In the case of craft production, barriers and regulators were identified along the whole value chain. However, the greatest challenge for craft was found to be securing markets for products, and new product development. This suggests that novel production methods should be supported. At the same time support is necessary to re-establish relationships with existing markets while also engaging with new markets to develop this value chain further.

From a wetland use and governance perspective, the study found that while there is a trend of declining use of the wetland for agriculture and harvesting of craft raw materials, many households still considered the wetland to be important for their livelihoods – for the production of crops in particular. Expansion and replanting of sugarcane surrounding the wetland has been extensive, which has resulted in increasing use of the wetland for grazing as the availability of fodder outside the wetland declines. This has given rise to increasing conflict between wetland farmers and livestock owners as most cropping lands within the wetland are not fenced. Crafters who make use of wetland plants also expressed concern regarding livestock damage to their craft raw materials, compounded by incidences of fires in the wetland which further damages the wetland plants that

they use. The challenges experienced by wetland users are compounded by a decline in local governance structures – local traditional rules are no longer effectively enforced. Furthermore there is limited involvement of state actors. The KZN Departments of Agriculture and Rural Development (DARD) and Economic Development, Tourism and Environmental Affairs (EDTEA) are key role-players in developing capacity for managing land use and providing support for Local Economic Development. A proposed governance structure has been developed, in consultation with local stakeholders to address the governance challenges identified.

There was an overriding concern from wetland users in Mbongolwane that the wetland is drying out. While this needs to be considered within the context of the drought that is currently occurring in the area, users indicate that this is a trend that has been occurring over some time. Reasons ascribed for this by wetland users included livestock-related damage, water abstractions and the expansion of sugarcane adjacent to the wetland. These factors require further investigation to determine whether these perceptions have any validity. In addition, a number of studies are suggested to better understand the ecosystem services and flows associated with the Mbongolwane wetland.

Conclusions and Recommendations

The study of the Mbongolwane wetland identified the following key issues that are limiting value chain development:

- Water – availability of water was an overriding concern for all stakeholders. While it is necessary to acknowledge the current drought, changes in land use surrounding the wetland as well as abstractions from the wetland may be compromising wetland structure and function and may also be contributing factors. This requires further research.
- Ecosystem services – Maintaining and improving ecosystem services is critical for ensuring sustained benefits for the socio-economic development of local and downstream users. Wetland – terrestrial system linkages cannot be ignored and changes in land use in areas adjacent to the wetland impact on the productivity and ecological functioning of the wetland, which need to be investigated to assess long-term impacts.
- Value chains and enterprise development – markets are the starting point for value chain development and feasible markets for products from the wetland are the starting point for the business plans. The approach taken was to focus on local markets first and work backwards from there. It is also necessary to realise that current levels of agricultural production from the wetland (and adjacent areas) do not meet household food requirements, meaning that substantial upscaling of production is required to achieve economies of scale. Value addition is also necessary to increase the scope of income-generating opportunities, particularly for the youth.
- Training, extension support and mentorship – there are substantial capacity constraints within the Mbongolwane community in terms of technical ability and institutional capacity. A fundamentally developmental approach is therefore required. Long-term support, training and mentorship are necessary to realise effective enterprise development associated with the wetland. Coordinated support, which is currently sorely lacking, from provincial departments (DARD and EDTEA), in partnership with non-government and research organisations is necessary to increase primary production and to facilitate value adding in order to build a vibrant local economy.

- Governance and regulations – Effective governance of the use and management of the wetland is necessary to ensure equitable, sustainable use of its resources. Current legislation prohibits wetland agriculture without the necessary permits. However, farmers will continue to farm the wetland, regardless of legislation limiting this. The research found that the highest proportion of people deriving benefit from the wetland is those engaging in agriculture. This requires a new approach to regulating wetland use in a manner that accommodates both the need to protect the wetland and the important contributions that wetlands make to local livelihoods.

Finally, the participation by various organs of state in supporting the Mbongolwane community is critical, although it is acknowledged that the capacity of many agencies at a local scale is severely constrained. This means that the provision of support requires the participation of both the state and development practitioners, primarily non-government organisations (NGOs) and pro-poor market players. Finally, governance should be a bottom-up process. User groups making use of the wetland should have the authority and take responsibility to manage the wetland resource with support from various organs of state and NGOs.

Based on the findings of the field research, a set of actions has been recommended as a 'business plan' for supporting value chain development of the Mbongolwane wetland resource, and for achieving better management of the wetland – which will in turn enhance the ecosystem services provided by the Mbongolwane wetland.

The business plan focuses on the following areas:

- Support for agricultural value chains – this includes extension and training, improved access to inputs and assistance with marketing and value addition. Four crops with substantial local markets (maize, dry beans, amadumbe and cabbage) have been identified as important crops to be supported. From a value addition perspective the feasibility and piloting of the production of amadumbe chips is proposed.
- Further development of craft value chains – here, various interventions along the value chain are proposed. Firstly, securing wetland plant species as a craft input is necessary, particularly for highly valued plants (e.g. *Juncus kraussii – iNcema*). In addition to this, diversification of products and production methodologies is necessary to meet an ever-changing consumer market. Linked with this is the development of partnerships with market players to inform product development, training and improve market access.

Securing the continued provision of ecological infrastructure by the Mbongolwane wetland requires further research to ensure that the contributions of the wetland to local livelihoods is not compromised by a decline in the ecological condition of the wetland. A number of studies are required to investigate this further, including studying the impact of land-based activities on wetland function, delineating the wetland boundary, mapping the flows of ecosystems services in the entire catchment and from these developing a wetland management plan.

ACKNOWLEDGEMENTS

The research that resulted in this report was financed by the Water Research Commission, whose support is gratefully acknowledged. Additional acknowledgements and gratitude are due to the following organisations and individuals:

- The Mbongolwane community and wetland users who willingly and openly shared their knowledge with the research team. In particular the support of Ms Sholiphi Mhlongo of Itubaleth'elihle Craft Centre is noted.
- Mr Bonani Madikizela of the WRC for technical support.
- Mr Brian Rapson and Mr Michael Ntuli of Tongaat Hulett Sugar for sharing information related to sugar cane production.
- Mr Gary Lagerwell of SASRI for rapid and pro-active responses to our queries.
- Mr D.A. Gcabasashe of Simamisa farming for providing insights into Simamisa's farming operations.
- Ms Thandazile Ngubane, formerly of Inina Craft Agency for information on the craft sector.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

DAEA	KZN Department of Agriculture and Environmental Affairs (now known as DARD)
DAFF	Department of Agriculture, Forestry and Fisheries
DARD	KZN Department of Agriculture and Rural Development (formerly DAEA)
EI	Ecological Infrastructure
EMF	Environmental Management Framework
FSG	Farmer Support Group
INR	Institute of Natural Resources
KZN	KwaZulu-Natal
NGO	Non-government organisation
SASA	South African Sugar Association
SUSFARMS	The Sustainable Sugarcane Farm Management System
TA	Traditional Authority
THS	Tongaat Hulett Sugar
USD	United States Dollar
VCA	Value chain analysis

CHAPTER 1: INTRODUCTION

The overall aim of this study was to investigate the viability of Mbongolwane wetland to economically support the local society through sustainable utilisation of natural resources. This study was focused on transforming the rural community of Mbongolwane and surroundings through integration of innovation, technology or research-based knowledge about the available and marketable natural resources such as wetland plants, agriculture, and other opportunities to be identified during the course of the project. The intention of the study has been to develop a knowledgeable community that embraces a healthy ecological infrastructure, supports sustainable and productive agriculture, utilises renewable energy, all of which should result in communities that are greatly self-sufficient and have ability to continuously improve their livelihood, including job creation, health, and education.

The study has therefore included the following specific objectives:

1. To identify main key issues and required interventions to enhance opportunities available in Mbongolwane
2. To Identify and develop value chain opportunities for natural resources or ecosystem services available in Mbongolwane
3. To propose viable market options for Mbongolwane natural resources
4. To develop a viable governance structure for sustainable use and protection of Mbongolwane
5. To develop a fundable business plan/case for five years, and subsequent 10 years for approval by core collaborators.

The study made use of ecosystem services and value chain analysis approach to investigate and seek solutions to the development challenges and opportunities faced by the Mbongolwane communities.

The report considers the following:

- Concepts of ecosystem services and value chains.
- Livelihoods and dependency levels on ecosystem services from the Mbongolwane wetland.
- Wetland ecosystem and services generated by Mbongolwane.
- Existing beneficiaries and users of ecosystem services.
- An analysis of existing value chains in Mbongolwane
- Governance and institutional systems.

It focuses on development opportunities facing Mbongolwane, ways in which these can be addressed to ensure sustainability and progress based on the outcomes of the situational assessment and key issues and required interventions to enhance opportunities available in the Mbongolwane area. This study builds on previous work by the Institute of Natural Resources (INR) and others (e.g. Kotze et al., 2002; Lewis et al., 2011; Hay et al., 2013). Information required to carry out the objectives of the report are based on the review of literature pertaining to Mbongolwane wetland use and stakeholder engagements to confirm issues identified and to identify areas where changes have occurred.

This report provides the basis for the development of the business plan for Mbongolwane, which is provided as a final chapter in this report.

The report is structured as follows. Chapter 2 provides an overview of the study area. Chapter 3 provides a summary of the literature review. The review elaborates on the concepts of ecosystem

services and value chains and gives a general overview of wetlands ecosystem services and their influence on local livelihoods, followed by a review of Mbongolwane specific literature in relation to wetland conservation and ecosystem services. Chapter 4 discussed key issues arising from the community engagement process in relation to value chains and use of the wetland resources. Chapter 5 analyses selected value chains in the Mbongolwane that make use of, or impact on the Mbongolwane wetland, considering the basic value chain, barriers, regulators, drivers and enablers. Chapter 6 proposes a governance structure to support the wetland and local livelihoods. Chapter 7 proposes intervention strategies to support livelihoods and ecosystem services. The concluding chapter provides the business plans that are proposed for the ongoing management and economic use of the Mbongolwane wetland to improve local livelihoods and also provides recommendations for further research.

CHAPTER 2: OVERVIEW OF THE STUDY AREA

The Mbongolwane wetland is located in the headwaters of the Amatigulu River and is located within the Ntuli Traditional Authority area in the uMlalazi Local Municipality. It is approximately 400 ha in extent and is characterised by a central core of standing water with *Phragmites* reed beds surrounded by *Cyperus latifolius* (*iKhwane*) reed beds and wetland grasses. The wetland provides a range of services to the local community and downstream users.

uMlalazi Local Municipality is largely rural and its economy is driven primarily by agriculture, particularly sugar cane, timber and citrus. Summarising important demographic data from the 2011 Census (Statssa, 2012):

- Total population is 213,601 of which 37% are children under 14.
- Over 90% are Zulu speakers
- Dependency ratio is 75%
- Growth rate is -0,34% (2001-2011)
- Unemployment rate is 35%
- 22% of people over 20 have no schooling
- 6% of people have a higher education qualification
- 13% of homes have flush toilets connected to sewerage systems
- 16% of homes have formal refuse collection systems
- 20% of homes have water piped into the dwelling
- 58% of homes have electricity from the grid.

So uMlalazi, like many distressed rural municipalities in South Africa contains a population with a high proportion of young people, high levels of dependency, high unemployment levels, high mortality and/or emigration levels, low education levels, and low service levels to homes. However, the area has relatively high agricultural potential, fairly good road infrastructure and is close to large urban markets such as Durban and Richards Bay/Empangeni. Government has identified the opportunity to diversify into food crops for sale and to improve nutrition, and other crops where there can be significant local value-addition.

The Mbongolwane wetland is the focus of the study, however, the areas surrounding the wetland and also downstream users of ecosystem services of the wetland also need to be considered in the broader context of the services provided by the Mbongolwane wetland. Sugar cane is a major agricultural land use, not only in the coastal area around Gingindlovu, but also further inland and also adjacent to the Mbongolwane wetland. The Amatigulu sugar mill is also located on the Amatigulu River and requires clean water to run its boilers. Along the coast, the Amatigulu Estuary is an important freshwater dominated estuary from an ecological, tourism and recreational perspective (O' Brien, 2015).

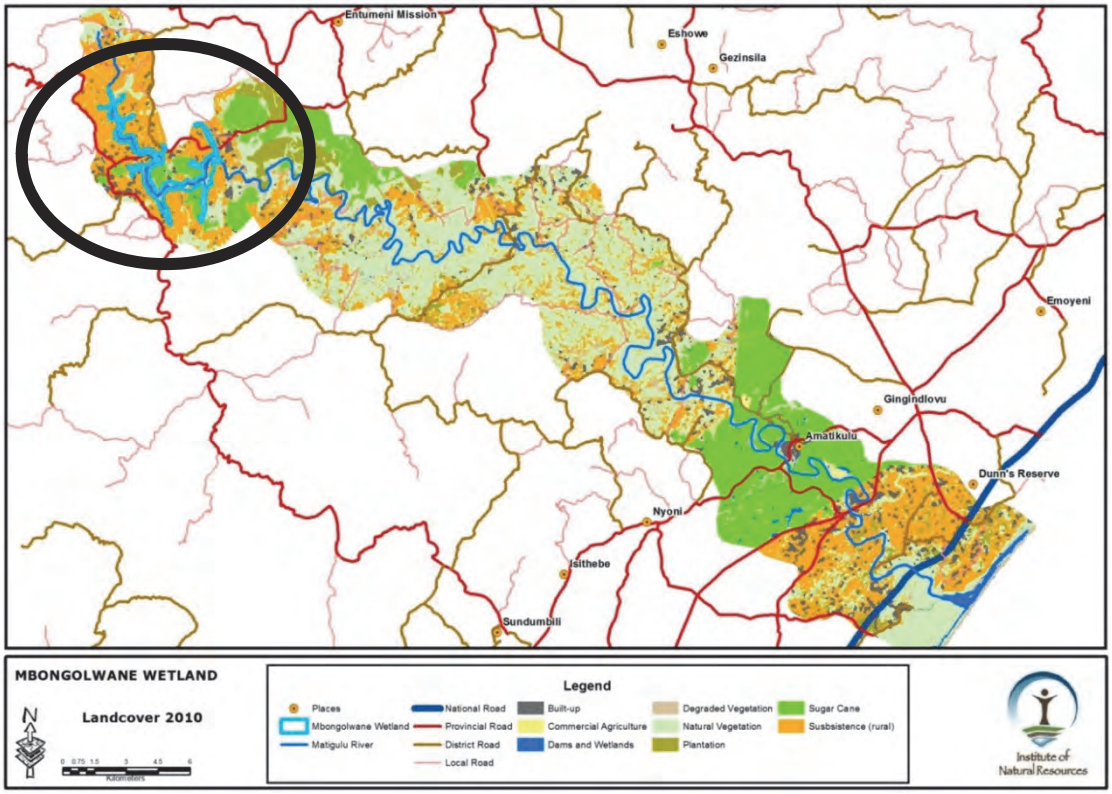

Figure 1: Land uses within the Mbongolwane catchment (Mbongolwane wetland circled)

CHAPTER 3: LITERATURE REVIEW

The review of the literature first introduces key concepts of ecosystem services and value chains and then focuses on these concepts within the context of wetlands in general and Mbongolwane in particular.

3.1 Key concepts

3.1.1 The Concept of Ecosystem Services

Natural ecosystems provide services that are important to mankind and provide a number of resources that contribute to human livelihoods. The collection of food, water, timber, fuel and fibre are some of the most ubiquitous utilities of natural systems. According to the Millennium Ecosystem Assessment Report (MEA, 2005), ecosystem services are "benefits people obtain from ecosystems". There are four types of ecosystem services: these are provisioning services which are resources obtained directly from nature such as food, water, timber, and fibre; regulating services which are those pertaining to the ability of nature to destabilize natural hazards (e.g. floods, disease, etc.) and thus provide a stable environment; cultural services are those that enhance the social well-being of people (e.g. recreational, aesthetic, and spiritual benefits); and supporting services are those that play a role in the natural regeneration of the environment (e.g. soil formation, photosynthesis, nutrient cycling, etc.) (MEA, 2005).

The current view of ecosystem services is embedded within the ecosystem approach which emphasizes that decisions about biodiversity and ecosystem services should be looked at in a holistic manner that considers the wider social and economic context of resource use. Therefore in this approach ecologists consider how ecosystems function in relation to how people can benefit from nature's services and how they can sustain and improve their well-being (Haines-Young and Potschin, 2009). Thus by considering the social and economic systems linked to ecosystems, this ensures that choices made with regards to ecosystem management are informed as far as possible and consider the whole array of stakeholders who depend upon the ecosystem services.

3.1.2 The concept of a value chain

A value chain describes range of activities necessary to bring a product or service from conception, through the different phases of production (Including physical transformation and the input of various services), and delivery to final consumers, to final disposal after use (Kaplinsky and Morris, 2000). Value chain analysis overcomes a key weakness of traditional sectoral analysis which tends to be static. Typical chain maps are illustrated either vertically or horizontally in such a way that they depict all "upstream" activities and functions (e.g. input supply, raw materials, farming activities) and "downstream" activities such as processing, wholesaling and retailing of products. Chain segments are normally represented by boxes that are linked by arrows that symbolise product, information or monetary flows (da Silva and de Souza Filho, 2007) (Figure 2).

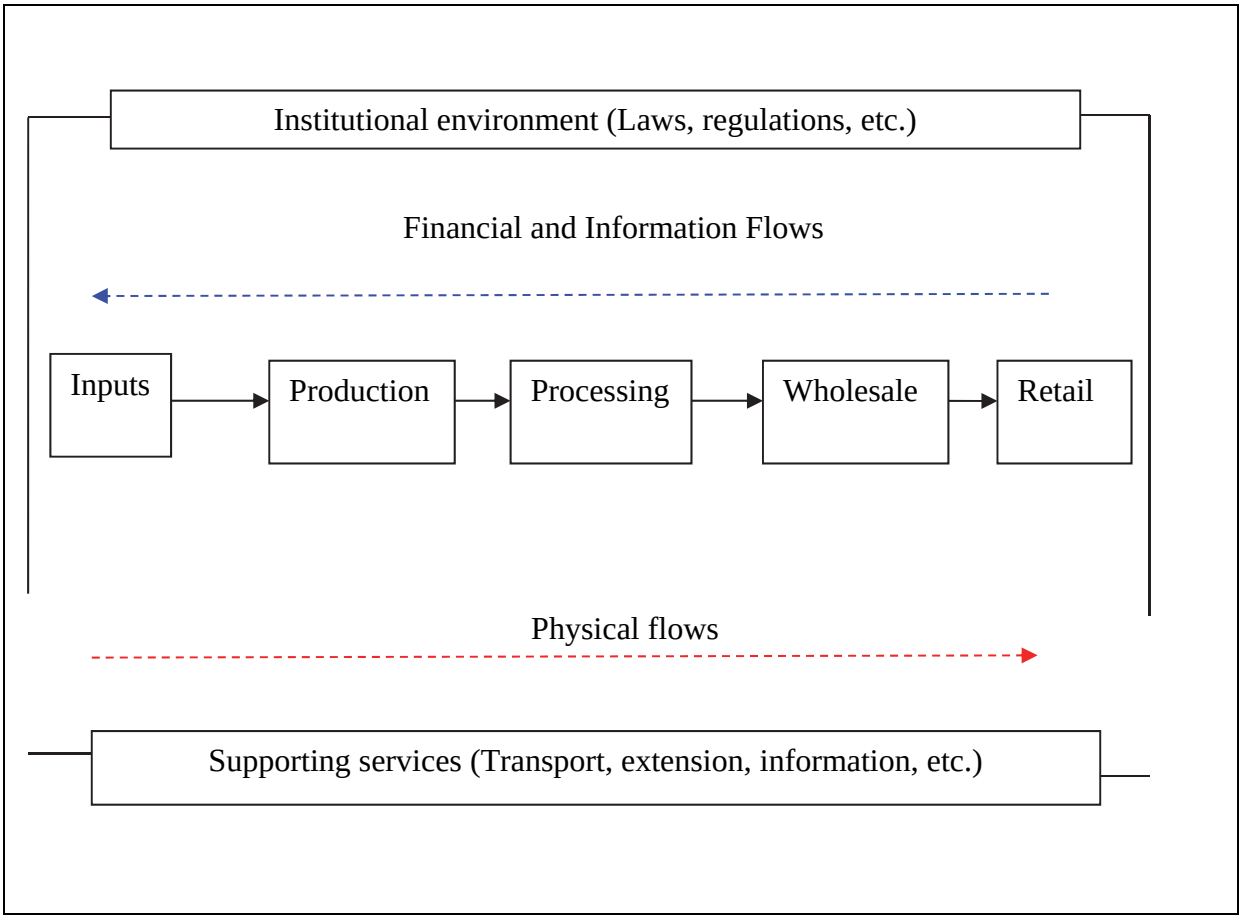

Figure 2: A generic, horizontally drawn value chain map. (after da Silva and de Souza Filho, 2007)

Most competitive value chains involve a lot of value addition and high product differentiation. When considering rural value chains, such as Mbongolwane, this is not always the case where there can be little value addition or differentiation of product. A number of factors could be responsible for this, for example, lack of knowledge and poor resources on the part of the entrepreneur. The impact of lack of support services on rural peoples' participation in value chains can be significant and should not be underestimated.

3.1.2.1 Alignment of value chains

When considering value chains, it is necessary to consider factors that advance and factors that retard the alignment of value chains. When value chains are more aligned, they are more efficient and generate greater value for actors in the value chain. These forces are subdivided into drivers, barriers, enablers and regulators of the value chain, as shown in Figure 3. Value chain drivers and enablers (such as consumer demand and information technology) positively affect the value chain by creating pressure on the sector to move towards higher alignment, while barriers and regulators (such as lack of trust and willingness to cooperate) slow down or reverse the movement (AEC, 1999).

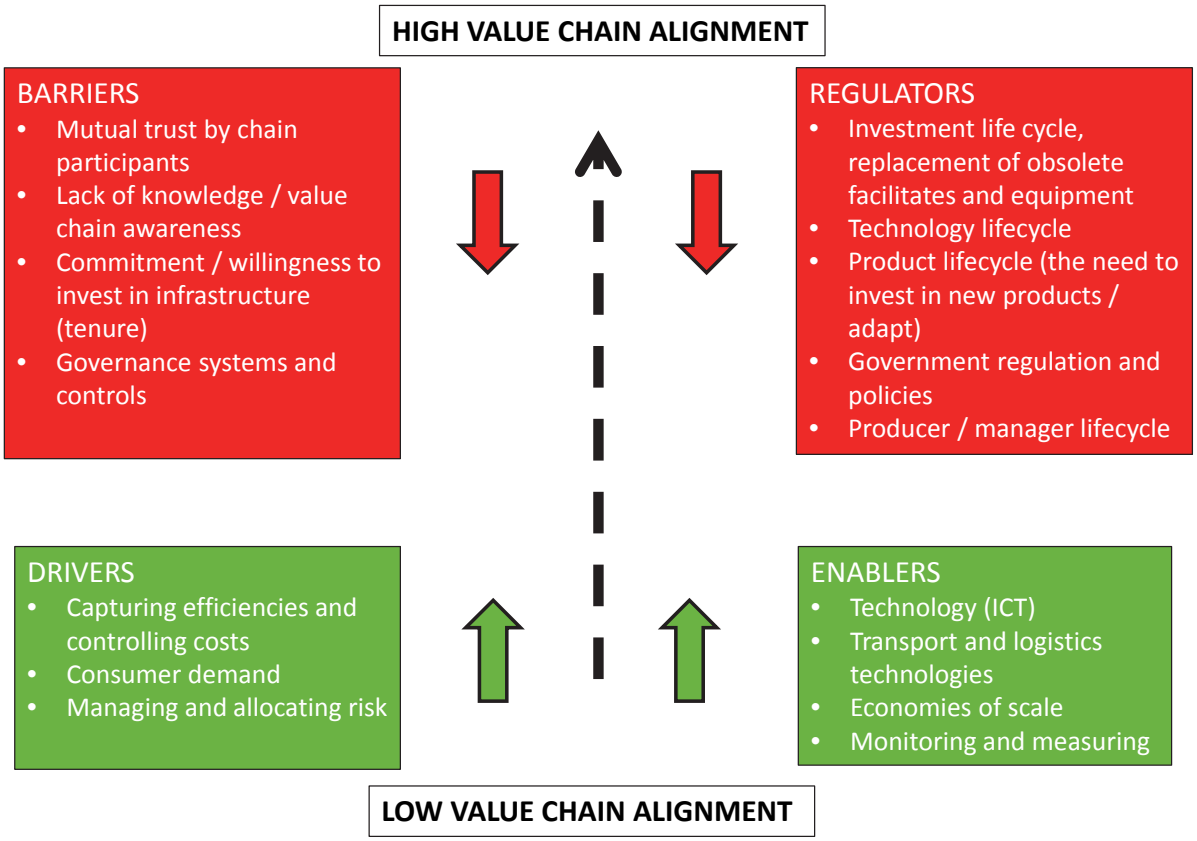

Figure 3: Forces that affect the alignment of agricultural value chains (after AEC, 1999)

Ideally, an efficient value chain must evolve from or improve from "Low Value Chain Alignment" to "High Value Chain Alignment". The positive factors that promote this transition are grouped into "drivers" and "enablers". Without strong drivers and value chain enablers, a value chain remains at a lower level, hence less profitable for the producer. In opposition of value chain alignment are "barriers" and "regulators". Minimising these antagonistic forces makes them more efficient and profitable. This highlights the need for ongoing monitoring and evaluation by companies to understand and keep track of these factors.

3.1.2.2 The benefits of undertaking value chain analyses

Value chain analysis (VCA) can be a strong agent of change; regardless of the location of a business along a supply chain, success depends on understanding and responding to the needs of the entire chain (Vermeulen *et al*., 2008). As a result, value chain analysis has become a central development strategy to enhance different sectors of economies. VCA is important because it allows for systematic competitiveness by identifying core competencies that are required, or which already exist, and because it involves mapping the flow of inputs (goods and services) so that one can see which parties' behaviour is important (Kaplinsky and Morris, 2000).

Multiple linkages of sectors within an economy can be effectively analysed and evaluated using the value chain concept and is helpful in identifying those industries with exploitable characteristics relevant to the objectives of the producers and the funding organisations/financial institutions. This is based on economic assumptions that producers channel their produce towards the most profitable markets so as to maximise their profits, while funding organisations advocate efficient production and marketing cycles that enable them to recover their invested incomes with interest.

VCA is can be important in detecting critical relationships involving changes in downstream output and labour demand/employment. This is vital in developing countries that are seeking solutions to

high levels of unemployment and low levels of productivity. Downstream value chain beneficiation allows for greater employment, particularly of unskilled workers, because downstream production is labour intensive and frequently makes use of unskilled labour (DTI, 2006).

Importantly, value chains are not linear processes. Regardless of the enterprise, an initial set of activities may achieve their intended effect, but will also have unintended effects, which requires ongoing analysis for proactive responses to change in the structure or operation of the value chain (Knopp, 2008).

3.2 Wetlands, ecosystem services & livelihoods in Mbongolwane

This section provides an overview of the general benefits to livelihoods provided by wetlands, followed by a more focussed assessment of the benefits Mbongolwane wetland provides.

3.2.1 Wetlands, conservation and livelihoods

Wetlands have played an important role in supporting peoples' livelihoods (Dixon and Wood, 2003; Adekola et al., 2010; Mombo et al., 2012). As a result, the use of wetland resources has attracted a lot of interest from various stakeholders (government agencies, businesses, NGOs and local communities) (Chong, 2005). Wetlands have become an integral part of agricultural intensification due to the year-round availability of soil moisture allows for more consistent food production under changing climatic regimes. This makes wetland agriculture an integral adaptive measure to climate change (McCartney et al., 2010). However, despite their importance, wetlands are one of the most threatened ecosystems in the world (Adekola, 2007). Government policies, socio-economic changes and soaring human populations have put pressure on wetlands due to increased need for agricultural production (Dixon and Wood, 2003). This results in extensive cultivation and drainage of wetlands, which can have significant impacts on the regulatory services of wetlands, leading to serious decline in their water storage capacity and variable streamflows (Schuyt, 2005). These changes can have serious ramifications for local communities dependent on them and also to communities downstream which depend on this flow.

A significant population in developing countries depend upon the utilisation of wetland resources for their livelihoods (Rebelo et al., 2010; Kalisa et al., 2013. Although not all wetlands provide all the products and services that wetlands can provide, most are a critical source of drinking water for rural communities as a result of their ability to purify contaminated water (Schuyt, 2005). They are also a source of craft or building materials, for example reeds and clay as well as a source of medicinal plants (Lewis et al., 2011; Mombo et al., 2012). These products are often important for the poorer members of the society who do not have access to the resources needed for more lucrative income generating strategies, such as fishing or agriculture.

The unique ability of wetlands to retain water far into the dry season has resulted in increased use of wetlands for agricultural purposes in many developing countries, particularly in Africa, where they are perceived by some as the "new frontier" for agriculture (Wood, 2009). This increase is driven by a number of factors, chiefly population growth, the degradation of overexploited upland (dryland) fields, market opportunities and the need to earn cash income (Wood and van Halsema, 2008). Primary agricultural activities taking place in wetland areas include livestock grazing and the cultivation of crops (Dixon and Wood, 2003; Kangalawe and Liwenga, 2005; Adekola, 2007; Adekola et al., 2010; Nabahungu and Visser, 2011; Kalisa et al., 2013). Although in the short term the agricultural development of wetlands results in an increase in the provision of food, in the long term it often increases the input of pollutants, removes their natural filtering function, and reduces other ecosystem services (McCartney et al., 2010). Pragmatically, any agricultural activity within a wetland will alter its ecological character to some extent. Although smallholders growing for subsistence agriculture may only cause relatively small changes in other services, in common with almost all

development activities, there are usually trade-offs associated with wetland agriculture (McCartney et al., 2010).

Due to this vague nature of the contribution of wetland agriculture to the overall well-being of local communities, there are contested debates on what constitutes "wise use" of wetlands. The tension is between conservation and development approaches that are rarely reconciled (McCartney et al., 2010). Frequently, wetland policies are driven by a conservationist agenda that actively discourages or ignores wetland agriculture (Mombo et al., 2012). At best, this means that wetland farmers are deprived of extension services that could help them better manage their wetland resources (van de Giesen and Andreini, 1997). At worst, it means that, often based on sparse or non-existent scientific evidence, communities are forced from wetlands with disastrous consequences to their livelihoods (McCartney et al., 2010). An example of this is the widely reported eviction of pastoralists from wetlands in 2007 in Tanzania, an action that is in line with the government policy intended to curb environmental degradation (Nelson et al., 2011). The future of wetland management for agricultural purposes could hinge on enhancing the link between these two opposing schools of thought to ensure that wetland agriculture is practised in an efficient and sustainable manner, which will be beneficial for both wetland conservation and people's livelihoods.

In traditional management systems, local people had always been central in the management of their resources, including wetlands. They managed them for centuries to secure their livelihoods, with local institutions (e.g. Kings and izinduna) playing a central role in resource management practices. Nonetheless, local communities have been systematically excluded from taking part in the management of these systems due to the pervasive influence of top-down, command-and-control, expert-driven management regimes, enforced by governments (Khan, 2012). This centralised management system, ignores the significance of other dimensions, such as social, ecological and cultural aspects of resource management, and limits the role of local resource users in resource management (Cousins and Pollard, 2001). This approach employs legal measures to protect wetland resources from degradation and the occurrence of a supposed tragedy of the commons (Hardin, 1968). The approach has generally ignored that Hardin's tragedy of the commons is applicable only to open access resources and not to common property resources which is the situation in many communities (Bromley and Cernea, 1989).

3.2.2 Mbongolwane wetland and local livelihoods

The Mbongolwane wetland forms an integral part of the livelihood strategies of the people of Mbongolwane, with 88% of households depending on it for a variety of purposes (Kotze et al., 2002).

The highest proportion of wetland use is for cultivation. Harvesting of wetland plants for crafts and construction, collection of water for bathing/washing and collection of soil for domestic use are other important uses of the wetland. About 12% of the wetland area is used for cultivation (Kotze et al., 2002). Amadumbe, onion and cabbage are the three main crops cultivated in the wetland. Cultivation in the wetland occurs either through community gardens and isolated individual plots which are not part of any organisational structure. Cultivation is done manually, including the collection of water for irrigation and preparing the land. The proportion of crops used for household consumption or sold depends on the crop in question.

Ikhwane (*Cyperus latifolius*), umhlanga (*Phragmites australis* and *P. mauritianus*) and imizi (*Cyperus sexangularis*) are the three most commonly harvested wetlands. Ikhwane is mainly used to make crafts which are sold mainly locally although some of it is used for household purposes. The market for ikhwane products is mainly local (e.g. during traditional ceremonies) although outside sales do occur (Kotze et al., 2002). The lack of market opportunities is a major constraint in craft production. Conference bags developed and marketed through various NGO driven support projects were once very profitable items and generated substantial income for the local craft group. However, recent

years have seen a reduction in orders for conference bags which suggests that the craft group needs diversify products in order to generate stable income.

Reeds collected from the wetland are also used for household purposes (e.g. roof construction), however, this in decline as there is a trend towards the use of purchased roofing materials (corrugated iron) (Lewis et al., 2011). Based on estimates at the time, harvesting rates for ikhwane and other reeds are low when compared with the amount that can be sustainably harvested, suggesting suggest potential for increased harvesting of these materials (Kotze et al., 2002). Hay et al. (2013) revisited a survey conducted by Kotze et al. (2002) to determine changes in the use of various wetland resources. The results showed a reported decline by households in wetland use of cultivation, harvesting wetland plants, water for drinking, bathing and washing and for the harvesting of medicinal plants. Notably there was a dramatic increase in the use of the wetland for grazing and livestock watering. This suggests increasing pressure on the wetland by livestock, possibly due to changes in land use surrounding the wetland. The results suggest that overall the demand for wetland provisioning services is declining, which corroborates the findings of Kotze et al. (2002) and Lewis et al. (2011).

3.2.3 Wetland management and governance

With regards to wetland management, the Traditional Authority (TA) remains the sole authority over wetland use at the ward level. Among the responsibilities of the TA, maintaining cultural values, dispute resolution, administration of customary law and, very importantly, allocation of land remain the core responsibilities. With regards to cultivation in the wetland, community gardens continue to be run through elected Garden Committees, which serve the interests of members of particular community gardens. For households cultivating in the wetland but outside of the community gardens, there is very little (if any) influence directly or indirectly by any particular organization. Similarly, craft groups are also administered by elected committees (Kotze et al., 2002). With regards to livestock owners, there is no representative committee and thus cattle owners graze/drink their cattle in the wetland at their own discretion with little influence from other persons or organisations. In the past, the previous TA ensured that grazing of livestock in the wetland was not allowed at any time of the year. However the new TA no longer enforces this rule and coupled with the decrease in crop production in the wetland, livestock are increasingly gaining access to the wetland (Kotze et al., 2002, Mhlongo pers. comm.).

There are low levels of conflicts of interest with regards to wetland use in Mbongolwane. Most of the conflicts are between wetland cultivators and cattle owners as cattle occasionally damage crops. There is also conflict between traditional authorities (who by virtue of their inherited or appointed positions are sometimes accused of being undemocratic) and the newer municipal structures which are democratic in the sense of having officials appointed by the political party elected into power for the district. These newer authorities are seen by the TA as undermining their traditional powers, which may be an important source of conflict even where both have the same political party allegiance. Conflict between sub-wards also occur, whereby some sub-wards perceive others to be receiving preference with regard to current or planned future developments and then seek to disrupt this development so as to maintain equity. Conflicts between individual households over access to land do also occasionally occur. The primary mediator in resolving these conflicts is the TA, whose capacity to do so vary from case to case (Kotze et al., 2002).

A recent study in Mbongolwane has shown that historically, people relied on the use of the wetland as a key livelihood strategy, with the local economy significantly driven by subsistence use of natural resources harvested from the environment and by crop production to meet household nutritional needs (Lewis et al., 2011). While a small level of trade has always been maintained (e.g. sale of surplus crops and natural resource products), this has in the past only been a small component of the local livelihoods and the local economy. However utilisation of the wetland's provisioning

services has declined in general, and currently it is mainly the older women who are still working the fields and harvesting natural resources. There thus appears to be a shift away from a subsistence and resource-based economy (which includes only a small component of cash trade) to a more commercial and cash-based economy, driven by cash incomes obtained primarily from welfare grants and to a lesser extent remitted incomes and trade (Lewis et al., 2011). The youth, in particular, appears to be driven by the desire to earn cash incomes as a primary mechanism of sustaining their livelihoods, rather than using the wetland's provisioning services. Those that have stopped utilising the wetland for agriculture and natural resources have instead introduced trade activities (e.g. selling airtime, etc.) into their livelihood strategies as an alternative so as to increase their cash earnings to be used to meet other household needs. This inter-generational shift in the dependency on the wetland could have positive environmental implications because the decline in use levels of the wetland for crop production and resource harvesting reduces pressure on the wetland, and creates opportunities for improved management and a reversal of degradation levels. On the flip side, there is an increasing risk that the trend of decreasing dependency on the Mbongolwane wetland for provisioning services will decrease concern about the condition of the wetland, resulting in a reduced public participation in conserving it (Lewis et al., 2011).

3.2.4 Towards valuing services provided by Mbongolwane

One critical aspect that would need to be considered in generating the proposed value chain approach will be the valuation (economic) of wetland ecosystem services. The economic value of these goods and services can be made more explicit through economic valuation studies (Mmopelwa, 2006). An analysis of the various wetland services was conducted, the outcomes of which are detailed in Appendix 1, while a summary is provided in Table 1. While the objective of this project is not to place and economic value wetland services, it is helpful to consider the different values that have been attached to wetland ecosystem services. What is clear from the table is that the valuation of the services provided vary widely and that values are based on different aspects (e.g. some on a commodity basis and others on a per hectare basis). The value of the services on a per hectare basis alone range from 14 USD/ha to 1 765 USD/ha, while the value for cropping at the cases reviewed in the table range from 1000-4000 USD.

Table 1: The economic value of various wetland uses and wetlands from various parts of the globe.

Use	Value (USD) per annum for the whole wetland												
	South Africa, Limpopo (Ga-Mampa[1])	Tanzania (Kilombero Valley[2])	Lesotho (Latseng la Letsi[3])	Nigeria (Hadejia-Nguru[4])	Uganda (Nakivubo[5])	Zambia (Barotse[6])	South Africa, Mpumalanga (Olifants River[7])	Botswana (Shakawe[8])	Tanzania (Bahi Wetlands[9])	Rwanda (Cyabayaga[10])	Southern Africa (Zambezi[11])	India (Bhoj Wetland[12])	South Africa, KwaZulu-Natal Mbongolwane[13])
Grazing			540 286								3 900 000		
Cropping	1 072											11 100	4 425
Edible plants	84												
Thatching/crafts	176							1199			378 000		3 557
Hunting	49												
Fuelwood	667												
Fishing	12	199									6 500 000	177 778	
Water												470 000	
Medicines													
Social/ceremonial													
Whole wetland	90 000		1 765/ha	54/ha	500/ha	97/ha	14/ha		44	1 901			

1= Adekola et al., 2010; 2= Kangalawe and Liwenga, 2005; 3= Lannas and Turpie, 2009; 4= Barbier et al., 1997; 5= Emerton et al., 1999; 6= Turpie et al., 1999; 7= Palmer et al., 2002; 8= Mmopelwa, 2006; 9= Mwakaje, 2009; 10= Nabahungu and Visser, 2011; 11= Schuyt, 2005; 12= Verma and Negandhi, 2011; 13= Kotze et al., 2002

This also needs to be considered in the context of a declining demand for the services provided by the Mbongolwane wetland to local people and may require a broader evaluation of the services by considering downstream users (e.g. irrigation).

3.3 Discussion

More than anyone else, poor rural communities are dependent on wetlands and the great variety and abundance of resources that they provide. These resources include reed collection (building material), sedge collection (art and craft material), fishing, wild fruit collection, hunting, fuel-wood collection, edible plant collection, medicinal plant collection and collection of water for drinking, washing and bathing (Adekola, 2007; Lewis et al., 2011; Mombo et al., 2012; Kalisa et al., 2013). However, these resources cannot in their entirety cover all household needs such as school fees, transport fares, clothing, etc. There is therefore a need to convert these services into monetary form so as to meet other household needs. In Mbongolwane, there is already a shift from subsistence-based wetland utilization towards a cash-based economy. Therefore the demand for cash in the local economy is high. Creating a viable business venture from ecosystem services and resources provided by the wetland will therefore play a pivotal role in uplifting the livelihoods and contributing to the development of the Mbongolwane area as a whole.

CHAPTER 4: KEY ISSUES ARISING FROM THE COMMUNITY ENGAGEMENT PROCESS

A number of meetings and focus group discussions were held with community members to inform this study. Initially, focus group discussions with wetland cultivators, craft and livestock keepers were conducted. The main purpose of these meetings was to obtain information on the current state of affairs regarding the particular use of the wetland, how the use has changed over time, who governs the use of the wetland, what problems are associated with a particular use and what are some key innovations and ideas needed to enhance a particular use from the community's perspective. Transect walks were carried out along the wetland to search for livestock owners or herders to elicit information from them regarding issues associated with livestock grazing.

Arising from the initial engagements, a number of local user groups were identified who had a stake in the wetland or benefited from the wetland in some way. To elicit information from the various stakeholders, semi-structured questionnaire surveys were conducted with the identified user groups. Interviews were held with five selected stakeholder groups:

- Community garden group members farming the wetland (Thuthukani and Zamani groups),
- Thubaleth'elihle Craft Group members (Users of craft raw materials from the wetland)
- Independent wetland cultivators
- Independent sugarcane farmers
- Livestock owners.

Interviews were conducted with 22 interviewees to understand benefits derived from the wetland, and the importance of the wetland for local livelihoods.

After an analysis of the surveys and further community engagement, selected value chains were identified for assessment and are further described in Chapter CHAPTER 5:.

4.1 Overall demographics

There was a huge variation in age among the interviewees, ranging from 33-85 with an average of 52 years. Most respondents were between the ages of 40 and 69, with only two individuals over 70 and two individuals under 40. The majority of the households (82%) were headed by men with the rest headed by women. Women heading households were generally elderly (≥55 years). Household sizes ranged from 4-15 with an average size of eight individuals. Women and children on average made the highest number of household members with men being the minority.

The largest contributors to income among the surveyed households were child support grants, part-time employment opportunities and pension. Very few households had members who are employed full-time. The majority of the respondents (86%) had access to land and most people preferred to use homestead land to grow crops with only a few joining community gardens. It can be inferred that those who joined community gardens were the poorer members of the society who could not afford to farm on their own and decided to join community gardens because they share all the costs, motivate each other and are also in a position to receive support from various state agencies. In a sense farming together helps to establish a social safety net. The majority of households (73%) owned livestock and the most common livestock being.

4.2 Wetland agriculture

Agriculture in the Mbongolwane wetland is one of the major uses of wetland resources. Wetland agriculture consists of two community gardens (Thuthukani and Zamani community gardens) within the wetland and numerous independent farmers cultivating the wetland.

4.2.1 Independent wetland farmers

Independent wetland farmers (i.e. individual households farming in the wetland who are not part of community gardens) had field sizes ranging from 0.03 to 0.06 ha. There is no restriction on their field size and farmers can select their preferred place for cultivation, subject to permission from the TA. Most respondents indicated that they use no pesticides but two farmers indicated that they use ash mixed with soil, which they found to reduce pest damage significantly. They also use manure as the only input when preparing the soil for cultivation. Similarly, they do all the work in their fields by themselves with no one from the family helping them. Most cultivators use furrows to channel water along the fields. Independent wetland farmers indicated that they only produce for household consumption and do not receive any support from any government department or organisation. Tt appears that independent wetland farmers are better off compared to community garden members. Independent farmers produce mainly amadumbe, maize, beans and potatoes although some produce vegetables. The biggest challenge faced by independent wetland farmers is the lack of water. Another huge challenge is livestock damage as their fields are not fenced. The third problem they struggle with is the lack of seed input which they have to purchase on their own. Farmers ranked crop production and collection of water for irrigation as the two most important wetland uses to them.

4.2.2 Community gardens

The community garden members generally had small field sizes, which ranged from 0.01-0.05 ha per person within the garden. This could be due to the fact that there are many members in a garden group and as garden membership increases, the field sizes get smaller and smaller. Both community gardens are managed through an elected garden committee, which is responsible for allocation of land within the garden for growing crops.

Crops produced by the groups include carrots, beans, onion, cabbage, amadumbe, maize, beetroot, spinach, green pepper, sweet potatoes and peas. The majority of the crops produced are for household consumption with a small portion sold for cash income. Previously, the gardens were highly productive, but are now in a poor state, with only about 20% of the garden areas planted. This can be attributed to a number of factors, which are described below.

Firstly, irrigation is a major challenge. In the case of Thuthukani, pipes delivering water to the garden were damaged by ploughing by sugarcane farmers and were never repaired. The garden is now watered by hand, and as the wetland is getting drier, accessing water has become increasingly difficult. Farmers are now resorting to more drought resistant or dryland adapted crops rather than high value vegetable crops. The lack of water has also contributed to declining membership.

Furthermore, competition between livestock and farmers for water sources is also a challenge. In the case of Zamani, cattle damage is also problematic due to the poor state of fencing in this garden. It was suggested that to resolve this, areas designated for grazing and for cultivation should be established. As a result, the lack of water could be seen as a serious constraint to their production and farmers were unanimous in confirming this.

Another factor contributing to the decline is the lack of support from the provincial Department of Agriculture. In the past, farmers were provided with extension support and assisted with some inputs, which is no longer provided.

There is also a concern on the part of the community gardeners that herbicides and pesticides sprayed on nearby sugarcane are having negative effects on their production. Farmers currently use mainly natural fertilisers (e.g. kraal manure) and natural pesticides (e.g. chilli spray), although farmers also acknowledged that when insect pests were problematic, ‘Blue Death’ (An over the counter granular insecticide) was the chemical of choice to solve this problem.

Most members indicated that to get rid of pests, they used Blue Death in the past but now they can no longer afford it. Garden members work their own plots and receive no assistance from home. Gardens are prepared by hand and furrows are used to channel water around the fields. Production had declined substantially. Previously members would sell a lot of produce but current production is not even sufficient to meet household needs. Marketing and selling of crops is not an issue as members indicated that if they can produce enough crops, selling them would pose no challenge at all. What therefore needs to be dealt with is how to increase production.

Problems encountered by community garden members were similar to those of independent farmers. The most pressing problem was lack of water. Garden group members and livestock are in competition for water with cattle destroying water points through trampling. The second problem expressed was pest damage. The Zamani group have a serious problem with livestock damage since their garden is not fenced and members cannot afford to replace the fence. All members expressed concern over lack of extension support from agricultural extension officers and the provision of inputs which they used to receive. Community garden members ranked production of crops and obtaining water for irrigation as the most important wetland uses to them. Other uses were ranked either low or medium in importance

4.3 Livestock owners

Discussions with livestock owners/herders revealed that cattle are the main type of livestock kept by community members with a small portion keeping goats and chickens. Cattle drink inside and outside the wetland and use the wetland anytime but mostly during the winter months when dryland areas are very dry. All livestock owners indicated that they do not sell livestock products (e.g. meat, milk, etc.).

Livestock owners indicated that they ensure that livestock are within their sight at all times to prevent damage to crops and expressed concern over the lack of sufficient grazing land blamed mainly on the expansion of sugarcane fields since Simamisa[1] Farming operations have intensified in the past two years.

Livestock owners also expressed concern over the lack of water from the wetland and suggested that this has increased their dependence on the wetland. They were aware that their use of the wetland may have negative consequences in terms of trampling and overgrazing but expressed that they have no other option due to the lack of grazing land outside the wetland. While there is alternative grazing land it is far from homesteads, it is not grazed due to fear of livestock theft. Livestock owners highlighted grazing and water for livestock were the most important wetland uses to them.

4.4 Thubaleth'elihle Craft Group

The Thubaleth'elihle craft group is located in Mbongolwane. Craft group members in the area sell a limited array of craft products including doormats, sleeping mats, conference bags, table mats and beadwork. The only purchased inputs are needles and twine, which is purchased from Eshowe. Crafters collect craft materials all by themselves with no assistance from family members. Currently craft sales are mainly within the community, especially at traditional ceremonies. Raw craft materials are generally not traded.

Previously, orders for crafts were administered in the Eshowe craft centre through Inina Craft Agency. They also indicated that in the past, the Farmer Support Group (FSG) used to help them in marketing their products. They indicated that currently, there are few orders coming and thus they

[1] Simamisa is an initiative of Tongaat Hulett Sugar that leases land in communal tenure areas for sugar cane production.

struggle to sell their products. The members are considering diversifying their products so as to find new customers. Some are considering even to go into sewing should they obtain training. They also indicated that they have never received any assistance from the government and thus do everything for themselves. Another challenge expressed was the late payment for orders which discourages crafters because they feel like money that is supposed to come to them ends up in someone else's hands. Another issue is the lack of market opportunities as there are very few orders coming.

A major problem expressed by craft group members was that the depletion of ikhwane stocks, attributed to the following reasons. Firstly, fires which they allege are set purposefully by Simamisa destroy the ikhwane. Secondly, there is increased grazing pressure from livestock, especially on newly growing ikhwane after it has been burnt. Thirdly, a perennial grass (*Panicum maximum*) is invading areas where ikhwane grows. Finally, people from Nkandla and Nongoma who come to the area to harvest ikhwane without permission are also a problem. These all result the low availability of ikhwane to crafters.

When ranking different wetland uses, harvesting craft materials was the only use rated as of high importance. The two key challenges can be summarised as a lack of market for product and depletion of craft raw materials from the wetland.

4.5 Sugarcane farmers

The production of sugarcane is an important income generator in Mbongolwane. While sugarcane production is not a direct user of the wetland, the expansion of sugarcane production can affect other land users in the area. The expansion of sugarcane can also have implications for the hydrological and ecological functioning of the wetland. There are two main models of sugar production in operation. There are independent sugar farmers who are land holders and manage all their own production and harvesting and then there is Simamisa, a programme whereby land is leased out by landholders to Simamisa Farming CC for the production of sugarcane.

4.5.1 Independent sugarcane farmers

Independent sugarcane farmers appeared to be generally most prosperous members of the Mbongolwane area, with filed sizes ranging from 1-25 ha. They use fertiliser and pesticides which are applied three times before the first harvest. Two farmers indicated that they supplement fertilizer with manure from the cattle kraals to minimize costs. Labour ranged from 8 to 42 people per annum, depending on whether or not cane was harvested in that year. All the sugarcane produced by independent sugarcane farmers is sold at the Mill in Amatigulu. The price they sell sugarcane for per tonne varied but ranged from R1300-R1700, depending on economic factors.

Most indicated that they chose to be independent firstly because they get more returns if they do things themselves. Secondly, they do it because it affords them the ability to be independent and have their income not tied to anyone. Furthermore, this gives them opportunity to improve their agricultural knowledge. Additionally being independent farmers is more sustainable provides a more stable source of income. Being independent also allows access to BEE-based government support.

The biggest challenge they face is the lack of financial support which they find as a serious problem because sugarcane farming is costly. Another problem is the lack of extension service which was promised to them. They find this problematic because they do not receive expert advice on how best to improve their production. Some farmers perceived that that the lack of support was to discourage them from farming sugarcane independently so that Simamisa can take over. Lastly, livestock damage was cited as a huge issue because their fields are too large to fence. They indicated that producing crops, grazing and water for livestock are the most important wetland uses to them. This is because most of them put some of their investment into livestock.

4.5.2 Simamisa

Simamisa is an initiative of Tongaat Hulett Sugar (THS) to lease land from individual land holders in communal tenure land. Simamisa is a service provider to THS that facilitates the establishment of cooperatives and the leasing of holders of individual land use rights to the cooperative. Usually, leases of 9 years and 11 months are signed. The cooperative acts as the land holding company. Simamisa as the service provider to THS also manages and oversees the production of cane on these lands. Land holders who lease their land out receive 10% of the cane revenue, which is distributed to land holders on a *pro rata* basis determined by the size of their land. Many farmers have leased their land to Simamisa. The expansion of Simamisa over the last two years in Mbongolwane has been dramatic. Many respondents who are not involved with Simamisa were concerned about the implications of large areas of land being put to cane, which has reduced the availability of grazing land and in some cases caused problems for wetland farmers.

4.6 Discussion

The consensus that emerges from the field visits is that the Mbongolwane wetland is still important for the provision of ecosystem services to the local people. A previous study conducted in the area had indicated that the importance of the wetland for ecosystem service provision is declining due to the injection of cash incomes into the local economy through social grants (Lewis et al., 2011). The surveys and focus group discussion suggest that the number of people using the wetland have declined. While this could be attributed to a shift towards a cash-based economy, the reason for the decline may also be that there has been a change in the economy, where people no longer have the financial means to carry on using the wetland (i.e. they no longer have enough money to buy inputs). The socio-economic survey showed that people in the area have limited sources of income with each household on average receiving only two sources of income with the most common source combination being child support grants and part-time employment. Most of the money received from these sources of income is used to buy food (although unlikely to be sufficient for household needs) and other household requirements, with very little money left for other purposes (such as buying inputs to participate in various activities). This may explain why many households have leased their land to Simamisa (including even their homestead gardens) as they thought they would get enough money to cover all household needs.

However, the participants in Simamisa state that money they receive is disappointingly low. One respondent complained that 1 ha of land had been allocated to Simamisa, but the money received for the whole year for leasing the land for sugarcane was only R1000. There were also complaints about how sugarcane is transported from sugarcane fields to the Mill. From the discussion, it was determined that when trucks come to transport sugarcane, they transport sugarcane one section at a time (each section having a number of people whose land is leased out). In this way, there is no way for the lessor to know how much sugarcane (i.e. number of truck loads) was taken from their land. As a result, they cannot gauge whether what they receive is what they really should be getting. Payments are made to lessors based on the area of land under sugar cane. The payments are made pro-rata on an area basis considering the average yield per hectare in the area. This suggests that farmers who have leased their land to Simamisa firstly do not understand how the payment system works and secondly that they believe that they are not receiving a fair payment for their sugarcane. Both of these indicate that there is a lack of communication between Simamisa and lessors, which may be straining relationships.

Another emerging issue is that the current governance structure (Traditional Authority, TA) seems to be failing in resolving conflicts among different stakeholders over wetland use. It also points to the lack of organisation among different stakeholders as the issues have been going on for a long time but have not been taken to the TA. Strengthening the governance structures and establishing committees to represent different stakeholder groups and also having a place where such issues are discussed (e.g. traditional court) will ensure that conflicts are resolved in an efficient manner.

Another issue is the lack of support from the Department of Agriculture which paints a bad picture about the functioning of the Department's extension service. It appears that solving the water issue (making it more accessible) will solve most issues. However, craft group members seem to be in real trouble as they face more challenges which are very complex. Designating area for ikhwane in the wetland should be the first step to resolve issue affecting them.

4.6.1 Use of ecosystem services

Figure 4 below provides an overview of activities within or impacting on the Mbongolwane wetland. The top of the diagram shows the central channel with standing water at the top and as one moves away from the channel, the ikhwane reed beds are shown. Moving further away is the transitional zone where grasses occur and finally, homesteads and dryland crop production outside of the wetland.

The red arrows indicated where conflict or negative impacts may be occurring. These include:

- Standpipes that are drawing groundwater, which could impact on the hydrology of the wetland and also on the availability of open pools used for traditional cleansing ceremonies.
- The expansion of sugarcane production is also seen to be increasing the grazing pressure on the wetland as there is less grazing available for livestock outside the wetland.
- The increasing occurrence of fire in the wetland is also a concern as it impacts on grazing, collection of craft raw materials, and wetland structure and function.
- Trampling and grazing by livestock can have a negative impact; however livestock are also important providers of manure as an input for agricultural production.

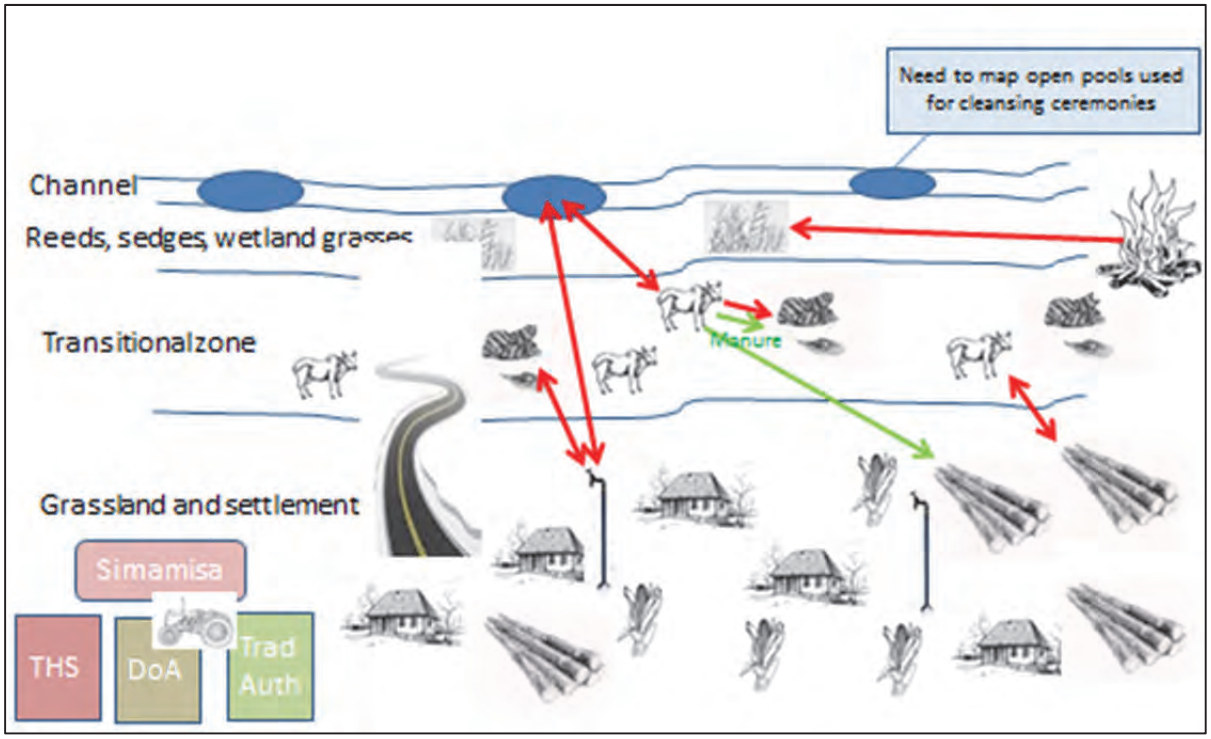

Figure 4: **Schematic representation of the Mbongolwane wetland, current activities within or impacting on the wetland and some key stakeholders, being Tongaat-Hulett Sugar (THS), KZN Department of Agriculture and Rural Development (KZNDARD) and the Traditional Authorities (Trad Auth).**

In order to understand the level of utilisation of the Mbongolwane wetland resources, the initial phase gathered information on the current state of affairs regarding the particular use of the

wetland, how the use has changed over time, who governs the use of the wetland, what problems are associated with a particular use and what are some key innovations and ideas needed to enhance a particular use from the community's perspective. The understanding of the extent of the various activities taking place in the wetland system also informed the entry point in the investigation of the various value chains. The findings are summarised in Table 2.

Table 2: Mbongolwane wetland utilisation activities, 2015

Use	Status	Comments/Issues raised
Cultivation of crops	Households cultivating small gardens/plots in the wetland appear to be declining, while commercial agriculture (sugarcane) seems to be on the increase. Crops that are currently grown within and around the wetland include: Amadumbe, Maize, Dry Beans, Cabbages, Spinach, and Sugarcane.	1. More land is being planted sugarcane under the Simamisa project, and there is continuous encroachment of the crop into the wetland area. 2. Community members also highlighted that the neglecting of wetland gardens is partly because of old age among the committed farmers and very few young people were engaging in agriculture. 3. Water is another challenge and the farmers perceive the wetland to be drier than what it used to be, hence crop farming is becoming a problem.
Harvesting of wetland plants for crafts, traditional medicines and construction	Community members could not ascertain whether there was decline or increase in the harvesting of plant material from the wetland. However, the community relies on the wetland for ikhwane and thatching material.	Crafters perceive the regeneration of ikhwane after harvesting to be taking much longer than before. They allege this to the low water supply in the wetland. This has affected the harvesting activities and the making of craft products in the community. The decline in commercial craft activities are also evidenced by low sales figures from the Inina Craft Agency, whose sales over the past five years indicates a decline in demand for product produced by Mbongolwane crafters Respondents indicated that they are aware that some few community members collected medicinal plants from the wetland. However, the knowledge of traditional medicines is not that easily available, hence only herbalists (Nyanga/Sangoma) mostly utilise the plants. Some livestock farmers also use medicinal plants to treat livestock diseases.

Use	Status	Comments/Issues raised
Livestock watering and grazing	Over the years, the wetland has become the major source of feed and water for livestock. Some households have even fenced temporary camps/paddocks in the wetland for their livestock. The most dominant livestock kept in the area are cattle and goats.	While the results from interviews indicate an increase in livestock watering and grazing, respondents indicated that there is scarcity of grazing land in the area. Most of the land that was uncultivated was previously used for grazing, but now the land is under commercial sugarcane production. Farmers are forced to weigh the benefits of keeping livestock on limited grazing land or give away their land to the Simamisa project in return for annual cash pay-outs. Overall, livestock watering is believed to be causing a decline in water supply as they continuously destroy the fountains/springs in the wetland system.
Drinking water	During the time of the study, there was no evidence of direct use of the wetland system for drinking water.	More people are obtaining drinking water from borehole standpipes and there is a perception that water obtained directly from the wetland was not clean enough for drinking, though usable for other activities like laundry and building.
Tourism/visitors	Respondents indicated that there has not been any tourist visiting the area in recent years (2014/15).	Respondents indicated that, while they were aware of tourism activities in the area in the past years (early 2000 to 2010), they had very little direct involvement and very few benefits accrued to the community. The activities have also declined over time and no activities are visible in recent years.
Fishing and hunting	None of these activities were reported during the time of study.	Larger water pools have disappeared in the wetland hence fishing is no longer taking place in the area. Furthermore, habitats for wild animals have always been destroyed due to increased human activities in the wetland; hence hunting is no longer taking place as well.

From the above information it is clear that the Mbongolwane wetland still provides an important source of livelihoods for the local people. Despite a decline in the dependency on the wetland due to a shift towards a more cash-based economy, the wetland still plays a pivotal role in the survival of people especially those who have limited opportunities to participate in the mainstream (formal sector) economy. Therefore there is a need to identify ways in which the services provided by the Mbongolwane wetland can be leveraged to generate improved income and enterprise development.

Three main enterprise opportunities identified in the diagram are tourism, agriculture and craft; however this is not an exhaustive list. For example, water abstractions from the wetland represent a cost saving for municipalities that should be providing this service and will also need to be

considered. The value chain approach was applied to better understand where support to wetland users should be focussed and is discussed in the next chapter.

4.6.2 Key issues emerging

A number of issues emerged from the engagement with key stakeholders, which are discussed in more detail below

4.6.2.1 Lack of water

The main issue highlighted by users, particularly wetland farmers, is the lack of water. This has been attributed by stakeholders to a prolonged period of low rainfall and the fact that the water in standpipes is pumped directly from the wetland and not from a reservoir. In addition to this, the Mbongolwane hospital extracts water directly from the wetland. This indicates that there is excessive extraction of water from the wetland.

4.6.2.2 Use of wetland resources

There appears to be a general decline in the use of wetland resources. Specific examples of this include:

- Cultivation – there has been a decline in the use of the wetland for agriculture with reports of a decreasing area under cultivation and a decreasing variety of crops being planted
- Building raw materials – with the tendency towards corrugated iron and brick structures, the use of wetland plants for thatching is on the decline
- Craft raw materials – there appears to be a decline in the market for these products that requires further investigation (there may be issues of quality, consistency of supply or competition from other suppliers)
- Water for domestic use – with the provision of municipal services, there is less demand for water, although local abstractions by the Municipality and the Mbongolwane hospital are likely to impact on the wetland water resources

In some cases, however, the demand has increased. This is particularly for the grazing and watering of livestock. This is attributed to the recent expansion of sugarcane planting in the area.

4.6.2.3 Increase in the planting of sugarcane

Through the THS 'Simamisa' programme, farmers are being encouraged to re-plant sugar cane fields to sustain supply to the sugar mill in Gingingdlovu. While this may have benefits to sugar farmers, the expansion of sugar cane production presents a number of challenges.

Some farmers wishing to expand their sugar production are burning ikhwane in the wetland with the intent of farming this land in the future. This has multiple implications – firstly, craft and building raw materials are no longer available and those making use of them have to travel further to get them. Secondly, excessive burning will compromise wetland condition and function. Thirdly and most importantly, large-scale mechanical cultivation, claimed by farmers to be occurring in the wetland, poses serious threats to wetland function. Field observations did not bear out this claim, but it should be noted that the transitional area between the terrestrial and wetland system is not clearly defined[2]. Furthermore, a full assessment of cane production adjacent to the wetland was not conducted and there may be areas where encroachment into the wetland may be occurring, but was

[2] The concern regarding the encroachment of sugar into the wetland was also raised with the South African Sugar Research Institute who investigated this concern. Certain small areas were found to be within the wetland and the industry has undertaken to ensure that these removed. Such proactive engagement and response by the industry is to be commended as it indicates that they are engaging positively on environmental matters.

not observed by the research team. Such practices, if they are occurring, can have negative implications for established groups making use of the wetland. An example of this is the irrigation pipe supplying Thuthukani garden which was cut by sugar farmers and not repaired, which has now affected this groups livelihoods. Wetland farmers are also concerned about the chemicals running off the sugar cane fields.

Further to the above, the dominance of sugarcane farming on available arable land means that there are few options for stakeholders to expand their own production (e.g. farming other crops and grazing). This is seriously the case among livestock owners and wetland cultivators who are now forced to look for alternative land far away from their homesteads to cultivate.

4.6.2.4 Declining institutions and governance

In the past there have been well established governance systems with relatively low levels of conflict. Wetland user groups, such as community gardens and craft groups have representative committees. One exception to this is livestock owners, who are making increasing use of the wetland for grazing and watering livestock.

From the perspective of support to agricultural production, it appears that support from the Department of Agriculture has been on the decline, with some groups reporting that they received no assistance from Government.

Many of the factors mentioned above are resulting in increasing conflicts between different stakeholders over wetland use, especially among wetland cultivators and livestock owners and between plant collectors and sugarcane farmers. The fact that these conflicts has been going on for a long time and have never been resolved indicates the failure of the current management system (the TA) in dealing with conflict. Furthermore, it also points to the lack of organisation among different stakeholders as the issues are only discussed among the people and have not been taken forward. Finally, it seems that there is a lack of enforcement of environmental legislation that controls the use and development of wetland resources.

4.6.2.5 Economic changes

There appears to be a shift from a resource dependent towards a more cash-based economic system at Mbongolwane. This shift could have positive effects as evidenced by declining demand for wetland resources, but on the negative site, there may be reduced incentives to manage the resource by the local community. This could result in the shift from common property towards open access, which could result in uncontrolled use and development of the wetland. Already there are reports of farmers wanting to plough the wetland as well reports of people from further afield, such as Nongoma and Gingingdlovu travelling to Mbongolwane to harvest the resources there.

CHAPTER 5: VALUE CHAIN ANALYSIS FOR SELECTED VALUE CHAINS ASSOCIATED WITH THE MBONGOLWANE WETLAND

The value chain approach was used to give an overview of a wide range of activities taking place in the Mbongolwane wetland system. The concept of value chain encompasses the issues of organization and coordination, strategies and the power relationships of the different actors in the chain (M4P, 2008), which have been discussed in the report. According to M4P (2008), the development of value chains might also affect social ties and traditional norms. For example, power relations within households or communities may be modified or the vulnerable poor population may be negatively affected by the operations of the value chain participants. It is important to note that smallholder agricultural value chains are dependent on traditional social norms and the environmental resources; hence a broader understanding of the governance systems is very important.

5.1 Approach to value chain analysis

The value chain approach was used to evaluate where value add and benefit opportunities exist for the services provided by Mbongolwane wetland. The specific approach to investigating the value chains at Mbongolwane was as follows:

- Identification of key value chains for analysis (e.g. agriculture, craft and tourism, as well as value chains for services such as water provision)
- Identify the actors and product flows within selected value chains, including input supply, production, processing, and marketing activities, resulting in a value chain 'map'. Marketing channels and opportunities also need to be considered in this context as these are important for creating and sustaining the demand for the product.
- Using the value chain maps, value chain bottlenecks, enablers and barriers will be identified and measures to address these will be developed.
- Key innovations ensuring efficient use of the wetland and its products need to be identified.
- Institutional and governance arrangements to facilitate better value chain alignment will be identified and mechanisms for implementation will be established.
- A final check should consider risks and threats to ecosystem services that value chain development may have on Mbongolwane wetland,

This section focuses on understanding livestock, crop and craft value chains that are driven by independent producers and community groups. The entry point and orientation of the value chain analysis in this study is the input procurement stage by smallholder producers. It was noted that the value chains in Mbongolwane are rudimentary with no strong linkages between different activities along the value chain.

The Mbongolwane wetland forms an integral part of the livelihood strategies of the people of Mbongolwane, However, in order for the wetland to continue playing its role, there is a need for an integrated framework that ensures the reconciliation of all its uses to prevent conflicts and also to guide the use to ensure that all resources are used sustainably.

- Livestock production (cattle, goats and sheep)
- Agriculture in the form of community gardens and independent growers within the transitional zone producing vegetables
- Sugarcane production (involving both independent cane production and Simamisa)
- Craft production.

Tourism was explored as an opportunity, but no direct tourism opportunities were found, for two reasons. Firstly, there is nothing that is particularly unique about Mbongolwane from a tourism

perspective (e.g. no readily visible 'special' birds, cultural attractions or unique ecosystems) and secondly, the distance one has to travel off the main roads to get there.

When conducting the analyses of the value chains that exist in Mbongolwane, it was found that, apart from Sugarcane, there was little or no information on the actual input costs and output values. In addition to this, as suggested in the previous chapter, it was found that there was very little, and in most cases no marketing of products. Thus it would not be possible to map the value along the chain. In light of this, it was decided to rather consider the barriers that exist along the value chain as a means of identifying what types of interventions would be necessary to enhance the benefits provided by Mbongolwane wetland for the local community.

5.2 The livestock value chain

A conceptual diagram of the livestock value chain is shown in Figure 5. The sale of livestock and livestock products appears to be extremely limited if non-existent, based on reports by respondents.

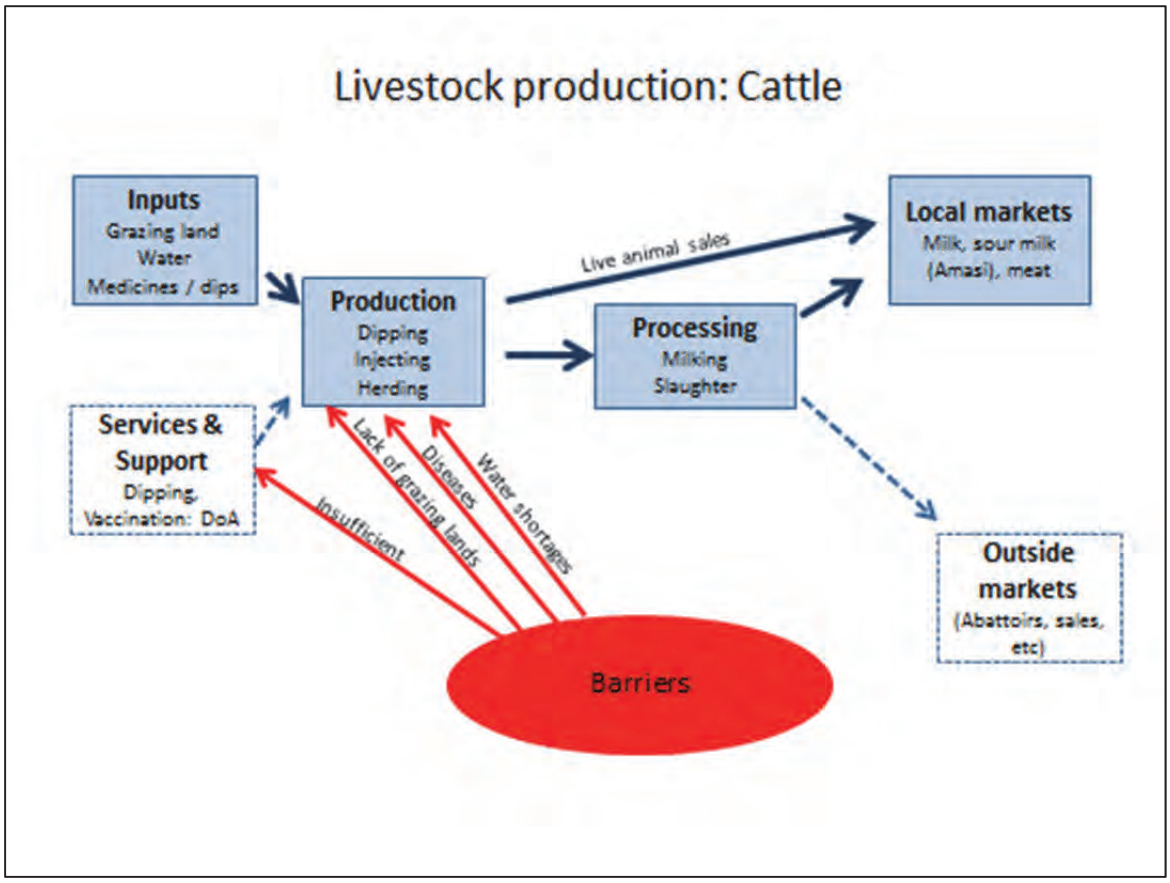

Figure 5: The livestock value chain

The main barriers highlighted from the input side are insufficient support and services from the provincial DoA, lack of grazing, diseases and water shortages. Water shortage and drying out of the wetland were also highlighted by farmers. In addition to addressing the constraints on the input side, both local and outside markets would need to be developed to grow this value chain.

5.2.1 Inputs, production and marketing

5.2.1.1 Input supply

The main inputs in the cattle value chain in Mbongolwane are water, grazing land, dip and vaccination medicines. Presently, the provincial DoA provides support with dipping chemicals and

vaccinations to dipping committees during disease outbreaks. In most cases, these are not enough to effectively get rid of diseases. Since most livestock owners cannot afford to supplement these from their pockets, they struggle to control livestock diseases. Grazing land and water, although occur naturally, were flagged as the most problematic as they declined substantially in recent years due to sugarcane field expansion and drought, respectively.

5.2.1.2 Production

Less than 50% of homesteads in the Mbongolwane area keep livestock and as such, livestock contributes very little to the local economy (Kotze et al., 2002). In the past, livestock were only allowed to use the wetland during certain times of the year. During engagements with livestock owners, it became apparent that this is no longer the case as livestock use the wetland throughout the year (although predominantly in winter and early spring). This was attributed mostly to the reduced availability of grazing land due to intensified sugarcane production in the area.

5.2.1.3 Processing and marketing

Presently, there is a lack of processing and sale of livestock products in the area. This is attributable to the fact that this industry is highly regulated which requires retailers to meet certain standards in their production. As a result, livestock in the area are mainly used for storage of wealth and for slaughter during traditional rituals. Because none of the livestock owners in the area are registered as licenced livestock products (meat) traders, there is currently no formal market in the area for livestock products which makes it difficult to gauge the business potential of the sale of livestock products.

Table 3: Livestock value chain alignment

Drivers --→	Currently, the driver for the livestock value chain is the demand for cattle. The demand is mainly for cattle for slaughtering during wedding, funerals, traditional rituals, etc. Based on focus group discussions, the demand for livestock products in the area is low.	The major enabler in the livestock value chain is the low levels of cattle theft which is not the case in other rural areas.	Enablers --→
Barriers --→	The major barrier in the livestock value chain is the low availability of water in the wetland, which results in a serious shortage of drinking water for livestock. This results in increased competition for water between wetland cultivators and livestock. Another barrier is the reduction of grazing land in the area due to the increase in sugarcane fields' extent. This forces livestock owners to increasingly use the wetland for grazing livestock which could eventually lead to its degradation. Other barriers include the insufficient support from the provincial DoA and the high incidence of livestock deaths due to diseases.	The main regulator in the livestock value chain is the lack of market demand for livestock products in the area due to the strict regulation of the industry. Due to this, livestock in the area are mainly used for storage of wealth and for slaughter during traditional rituals.	Regulators --→

The livestock value chain is poorly developed and there are significant barriers and regulators to the development of the livestock value chain to enhance livelihoods. In addition, the steadily decreasing availability of grazing land suggests that commercial development opportunities are limited. Finally, the keeping of livestock focusses on maintaining a stock of wealth rather than a tradeable commodity. For these reasons, the development of livestock value chains is not considered appropriate for the Mbongolwane community.

5.3 Wetland agriculture

Wetland farmers, particularly those in communal gardens indicated that in the past, surplus crops were always produced and there were plenty of opportunities to market these. In more recent times, production has declined and now production is used only for meeting the needs of households which, in many cases is still not sufficient.

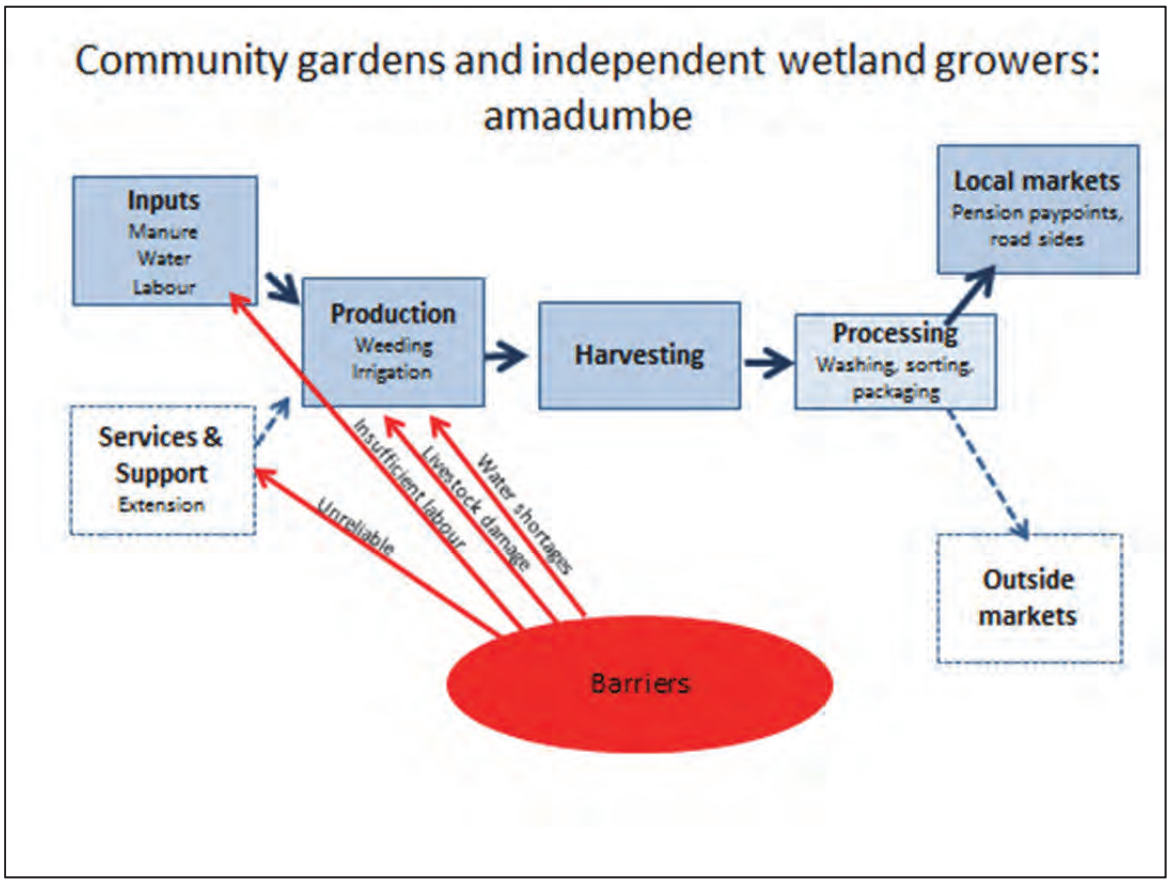

Figure 6: The value chain for wetland agriculture

The main barriers identified by wetland farmers were a lack of support services in the form of agricultural extension, insufficient labour and livestock damage. However the main barrier highlighted by all respondents was lack of water.

5.3.1 Maize value chain

5.3.1.1 Input supply

A range of inputs are critical for maize production, and these include tradable inputs like seed, fertilisers, herbicides, pesticides and the non-tradable inputs like soils and rainfall. Tradable inputs are procured mainly from retail shops in Eshowe (20 km from Mbongolwane community). Farmers in Mbongolwane community mainly procure hybrid maize seed and few indicated that they purchased inorganic fertilisers. Farmers indicated that the soils in the wetland are deep and fertile; therefore,

farmers do not apply much inorganic fertilisers. Where supplementary fertilisation is required, farmers use organic manure in the form of cattle manure and crop residues. Scientifically, organic manure is proven to improve soil texture and structure. Furthermore, it improves fertility and microbial activity in the soil, which might be a desirable attribute for the wetland ecosystem. The water holding capacity of the soil also improves due to use of organic fertilisers.

5.3.1.2 Production

Maize production in Mbongolwane is predominantly practiced in dryland fields, community gardens and homestead gardens. Due to lack of irrigation infrastructure, maize is produced in summer (October-January), when rainfall is expected to be relatively high. In winter, maize is predominantly grown near or within the wetland to benefit from the relatively moist conditions of the wetland soils. However, winter maize is not very common due to frequent occurrence of frost in the wetland.

5.3.1.3 Processing and marketing

Most of the maize produced in Mbongolwane is sold and consumed as it is with no value addition. The majority of maize that is sold is sold at pension pay points raw, cooked or roasted. When raw, maize sells for R50/20 litre bucket of grain. According to farmers, maize is a profitable business in the area as it serves as staple food for the majority of the people. Most maize is sold locally although a substantial amount is sold in the surrounding areas at pay points. Most of maize producers cited the lack of transport access as a factor causing the maize market to be localized. There are some maize producers in the area who use innovative means to add value to maize as shown in the case study in Box 1 below.

Box 1. Value addition of maize in Mbongolwane

Mr Mbatha produces maize on his 2 ha dryland fields and wetland garden measuring 0.04 ha in Mbongolwane community. Part of the maize is sold to community members, while bulk of it is utilised within his household. The maize is consumed as samp, mealie-meal, traditional beer, etc. He also crushes the maize to feed his chickens. Mr Khumalo keeps between 30-60 indigenous "Zulu" chickens at a given time, and they are mostly for household consumption. His low cost 'hand mill' uses human power and can crush about 20 kg of grain per hour. This saves the family money to pay for milling services at the nearby business centre. Such low cost technologies can improve the utilisation of maize in rural communities. Given that most maize produced in Mbongolwane is used for household consumption and that most of them purchase additional maize to meet household requirements strengthens the need for to expand maize production to meet the local demand.

Table 4: Maize value chain alignment

Drivers --→	The main driver in the maize value chain is the high demand for maize in Mbongolwane and surrounding areas. Maize is a stable food for many people which is the factor most responsible for the high demand. The second driver is the ease with which the farmers obtain non-tradable inputs such as soils and manure which they procure form kraals and neighbours.	The major enabler in the maize value chain is the increase in technological advances that can enhance value addition of maize products such as the maize crushing machine (Box 1). These technological advances allow farmers to process maize by themselves and use it for a variety of purposes.	←-- Enablers
Barriers --→	The major barrier to the alignment of the maize value chain is the low availability of water and tradable inputs such as seeds, pesticides and herbicides. Associated with that is the high costs of obtaining these inputs as they are procured at Eshowe which is some distance from Mbongolwane. Another barrier is the fact that the sale of maize is predominantly at local level.	The main regulator of the maize value chain is the lack of extension support from the provincial Department of Agriculture. Furthermore, the environmental regulation that restricts farming on wetlands is another regulator not only in the maize value chain but to all crops as most farming activities occur on the wetland area.	Regulators --→

5.3.2 Dry beans value chain

5.3.2.1 Input supply

The production of dry beans is done by individual/independent farmers on individual fields located along the Mbongolwane wetland system. Dry beans are produced by a few farmers in the area, whose average plot size range between 0.25 ha and 0.5 ha per farmer. However, there are some farmers who could not be enumerated, whose production is much lower, on plots measuring less than 100m^2. Planting of dry beans takes place in February and harvesting commences around June. During this period, farmers indicated that the soil moisture and climatic conditions are favourable for the crop. The major costs in the production of dry beans are: tractor hire for land preparation (R600/0.5 ha plot), seed (R200/5 kg pocket), fertiliser (R500/50 kg) and labour (R30/day for weeding, planting, land clearing activities, etc.). Where the inputs are purchased in bulk, farmers hire transport from Eshowe town to Mbongolwane at a cost of R300/trip. As a result of the transport costs, farmers often combine their trips and send one farmer to buy small quantities of inputs, while others buy their inputs during their routine trips to buy household necessities. When that happens, small quantities of inputs (less than 20 kg) are purchased, which are not charged by the local transport providers. After the ploughing with a tractor, the farmers would then use hand hoes to break the soil clods and then plant the beans. Farmers carry out most of the production activities using family labour, except for instances where such labour is not readily available, hired labour is then utilised.

5.3.2.2 Production

Dry beans are either produced separately as a monocrop or intercropped with maize, spinach or cabbages. Scientifically, intercropping improves soil structure and nutrition through organic matter and nitrogen fixation respectively. At household level, it provides a good source of fresh produce that are important for the diet. According to farmers, where dry beans are produced as a stand-alone crop, an average yield of 150 kg to 200 kg is expected from a 0.25 ha plot.

5.3.2.3 Processing and marketing

Dry bean production is for both household consumption and sale. Farmers ensure that there is enough available for household consumption before marketing of the surplus. Economic theory states that such household decision making process is rational and is consistent with smallholder and subsistence production systems world-wide, whose objective is to meet household food security. There is no processing of dry beans at household level, hence consumption is mainly through preparation of traditional dishes, where beans is cooked as vegetables and/or mixed with maize to make samp. As such, beans are one of the main sources of protein in rural households. Based on focus group discussions, we learnt that on average, a household of 6 people consume about 5-10 kg of beans per month, depending on availability. This can be more if there are family gatherings or in larger households. Due to the importance of beans, more than 80% of the dry beans is utilised at family level, thereby contributing directly to household food security.

Farmers in Mbongolwane often sell less than 20% of the surplus beans produced. The most dominant market is the community members and small savings clubs (stokvels) in Mbongolwane. Dry beans are sold at around R400-R600/25 litre bucket. The beans are neither packed nor branded hence they are sold in the informal market. Farmers prefer the informal market because they gain higher prices than what retailers are offering, which is around R250/10 kg bag. Although major retailers (Spar, Saverite, Shoprite) often pack the beans in-store, and do not have packaging as a precondition for trading with them, the market channel is not profitable for the farmers. This is mainly due to the low trading prices and the cost of transporting the beans to the retailers.

Table 5: Dry bean value chain alignment

Drivers --→	The main driver in the dry beans value chain is the high profitability of the enterprise. This crop is the most expensive on the market therefore selling it provides substantial financial returns provided that there are enough customers. The high demand for dry beans at local as well as regional level is also another important driver of this value chain.	The major enabler in the dry beans value chain is the fact that dry beans do not require a huge amount of water. Secondly, the availability of manure tends to cut off costs of production and thus becomes an important enabler in the dry beans value chain.	Enablers --→
Barriers --→	The major barrier to the alignment of the dry beans value chain is the limited supply of water. The wetland is continuously getting dry over time and water available for the growth of crops is becoming scarcer. Furthermore, there is limited knowledge about pesticides/insecticides that can be used to control pests in the crop, hence farmers resort to hand picking of some insects like beetles. Farmers indicated that this method is time consuming and not effective because not all pests are visible during the operation. High cost of transporting inputs from the nearest town (Eshowe) to Mbongolwane community is another barrier in this value chain.	The main regulator in the dry beans value chain is the limited extension support from the provincial DoA. This becomes especially acute in the case of seed acquisition. Most farmers in Mbongolwane do not use improved seeds; they resort to recycled seeds or simply purchase beans from the supermarkets for planting. Even those that begun by using improved seeds end up recycling the seed over many years. There appears to be a high willingness to grow beans among farmers if seeds can be available at affordable prices. Another regulator is the low retail prices of dry beans when sold on the formal market. This causes farmers to keep selling dry beans in the informal market as there are more financial returns. Lastly, high transport cost for transporting beans to the nearby retailers in Eshowe town causes the dry beans value chain to be restricted to the local level.	Regulators --→

5.3.3 Amadumbe value chain

5.3.3.1 Input supply

The extent of production of Amadumbe (*Colocasia esculenta*) in South Africa has not been determined as mostly produced and utilised in the informal sector for subsistence with minimal formal trading (DAFF, 2011). The Amadumbe has been cultivated by villagers in KwaZulu-Natal, Mpumalanga and Eastern Cape for so long that it is regarded as indigenous food crop (DAFF, 2011). The Amadumbe is a wetland herbaceous, perennial plant of up to 2m in height (DAFF, 2011). Amadumbe can be cultivated under both wetland and dry land conditions, as they tolerate a range of soil water conditions, from wet, inundated soils in plenty to drier well-drained soils. Because of the higher soil water availability within the wetland, farmers in Mbongolwane grow Amadumbe in the wetland.

Amadumbe are propagated from whole corms or cuttings and farmers in Mbongolwane community get the planting tissue from corms from the previous crops or from other farmers in the community. Planting is done by hand and no mechanical implements are involved. The use of tractors or

machinery in general is difficult due to the small scale of production per household (50m x 50m plots) and the wet condition of the soils require hand labour instead of heavy machinery. The crop grows from available soil water and rainfall, with no supplementary irrigation. Farmers in Mbongolwane benefit from the high fertility of soils in the wetland, and do not add any inorganic (commercial) fertilisers to the Amadumbe crop. This is cost saving for farmers and the fact that the crop is not very susceptible to pest and diseases makes it a low cost crop, which takes about 8-10 months to mature.

5.3.3.2 Production

Amadumbe are one of the most commonly grown crops in Mbongolwane. Based on information shared during focus group discussions, farmers harvest about 30 x 20 litre buckets of Amadumbe from a single plot (50m x 50m), depending on the season. After harvesting, the storage life of Amadumbe is limited to its dormancy period after which sprouting starts and dietary value is quickly lost. The high moisture content of Amadumbe (70% to 80%) makes them susceptible to attacks by microorganisms while in storage. The corms are kept on a raised platform where they may remain in good condition for up to three to four months. Other storage techniques include packing in heaps and dusting with wood ash, or leaving it in the ground without harvesting until required (not more than two to three months).

5.3.3.3 Processing and marketing

Farmers in Mbongolwane community consume about 80% of the produce and market 20% of the Amadumbe. The young shoots of Amadumbe are used as boiled vegetables and the mature corms are boiled, baked or fried. Roasted or boiled corms can be eaten alone or with stew. The boiled corms are mashed and used as weaning diet for young children. Although there are known uses of the tubers such as the production of flour, which is used to prepare “fufu” in west African countries, this use is not practiced in Mbongolwane. It may be worth exploring the possibility of such value addition activities to determine if this would be culturally acceptable and improve utilisation of the crop.

On the marketing front, the major buyers are local community members. Trading takes place at pay points when villagers receive their social grants. Hawkers also procure from the farmers for trading in local towns like Eshowe. The farm gate price for Amadumbe is R120/20 litre bucket. Farmers harvest, clean and dust Amadumbe before selling, but no packaging is done.

Table 6: Amadumbe value chain alignment

Drivers --→	The main driver in the Amadumbe value chain is the high demand for Amadumbe locally as well as regionally. Furthermore, the presence of a wetland in the area is a huge driver since Amadumbe can tolerate water-logged conditions and thus can be planted on the wetland area using minimal inputs. The only inputs in the Amadumbe value chain is the labour required to prepare the field for ploughing.	The major enabler in the Amadumbe value chain is the fact that Amadumbe do not require much investment in terms of inputs as they can be cultivated within the wetland area. This significantly cut the costs of production.	Enablers --→
Barriers --→	The barrier to the Amadumbe value chain is the amount of labour required for producing Amadumbe. Amadumbe are produced in the wetland which makes the use of a tractor difficult and thus farmers depend on manual labour for their production.	The main regulator in the Amadumbe value chain is the lack of processing and value addition of the products at all levels.	Regulators --→

5.3.4 Vegetable production and utilisation in Mbongolwane

Vegetable production is done at household level, mostly for family consumption. Vegetables are planted on very small pieces of land (10m x 10m) or even less, both in community gardens and homestead gardens. Quantification of the yields and financial returns is a challenge due to lack of productions records by the farmers. However, qualitative profiling of the production system and utilisation of the vegetables was done through key informant interviews and results are presented in Table 7 , which indicates crops where farmers use mainly for own consumption or mainly for sale. In cases where more than 20% of the crop is sold, this was considered a high demand crop with further marketing opportunities should production be increased.

Table 7: Uses of different crops grown in Mbongolwane

Crop	For sale (>20% of crop sold)	For consumption (>80% of crop used for home consumption)	Comment on capacity to increase production
Cabbage	X		Very limited capacity to increase due to water and land constraints.
Spinach		X	It is highly perishable, without definite market and reliable transport to the market; farmers are reluctant to focus on market oriented production.
Dry beans	X		High value crop and high market demand in the community. Expansion in production is constrained by land, water and cost of seeds.
Tomatoes		X	It is highly perishable, without definite market and reliable transport to the market; farmers are reluctant to focus on market oriented production.

Crop	For sale (>20% of crop sold)	For consumption (>80% of crop used for home consumption)	Comment on capacity to increase production
Potatoes		X	Very few farmers grow potatoes in community gardens.
Sweet potatoes	X		Great potential to expand because it can be grown under rainfed conditions without supplementary irrigation.
Onions		X	Uncertain due to lack of clearly defined market.
Amadumbe	X		Expansion is dependent on water and land availability.

5.3.4.1 Input supply

Seed input for vegetable production is mostly procured from previous harvest although some of it is bought from supermarkets in Eshowe. For most vegetables, farmers indicated that obtaining seed input is not a problem except for crops such as cabbage and potatoes where it would be prohibitively expensive at times. Most vegetables are fertilised using manure collected from household kraals or from neighbours, thus vegetable production in Mbongolwane is relatively low cost. Therefore the inputs that seem problematic are seed and water.

5.3.4.2 Production and Marketing

Most vegetables are sold as they are and thus do not undergo any value addition prior to marketing and sale. However, vegetables need to be washed before being packaged. Most of the vegetables looked at in this study are used for household consumption with only a small portion used for sale. From conversations with farmers, the reason the sale of vegetables is low is because vegetable production in Mbongolwane has declined substantially following drought and what is produced barely covers the household needs. Of the vegetables that do make the sale, the market is restricted to the local community.

Table 8: Vegetable value chain alignment

Drivers --→	The main driver in the vegetable value chain is the high demand for vegetables especially at local level where the demand is high year-round.	The major enabler in the vegetable value chain is that fact that the inputs are relatively affordable which cut the costs of production and makes farming accessible to a broader section of the community.	←-- Enablers
Barriers --→	The barriers to the vegetable value chain are many and diverse. The first major barrier is the lack of water in the water which causes produce to have stunted growth. The second barrier is livestock damage to crops especially for independent wetland crop producers. This causes significant losses in in terms of production. Another barrier is the lack of sufficient labour. Most farmers are women and old and complained that the youth are not willing to help them in their farming activities. Another barrier is the unreliable extension service provided by the provincial DoA. Lastly, the lack of sufficient funding to buy pesticides causing crops to suffer significant crop damage is another significant barrier.	The main regulator in the vegetable value chain is the low production levels. This causes the vegetable market to be restricted to local level as farmers cannot sell produce to retailers in town due to issues such as inconsistency of supply.	Regulators --→

5.4 Craft value chain

Wetland craft producers appeared to have the most challenges at all stages in the value chain (Figure 7).

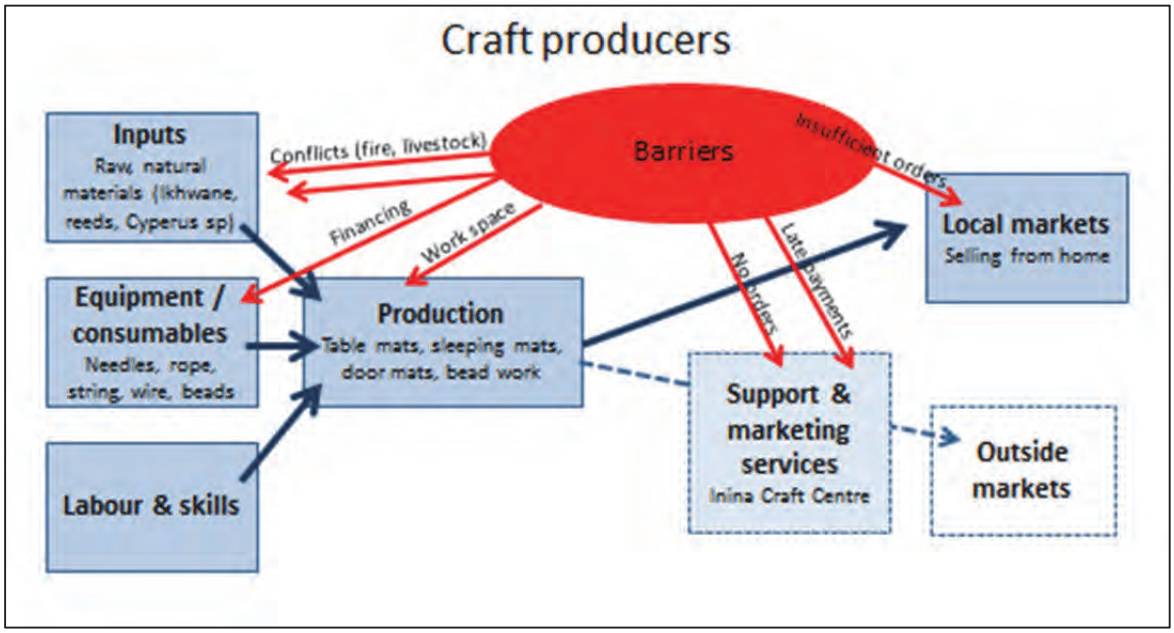

Figure 7: The craft value chain

From an input perspective, fires and livestock damage are a big concern, which is resulting in conflict. As far as marketing is concerned, a lack of workspace to produce the craft was also highlighted. By far, however, is the concern that here is a lack of support and marketing services for the crafters to reach outside markets.

5.4.1 Input supply

The main inputs in the craft value chain are ikhwane/umhlanga, sewing twine and needle. Among these items, plant materials are the easiest to get as they occur naturally. However, older women struggle to obtain them and as a result buy these products from younger women. The sewing rope and the needle are obtained from Eshowe and Durban, respectively. The rope costs R50 whereas the needle costs R7.50. Due to the long distance crafters have to travel to obtain these inputs and the subsequently high travel costs, crafters at Mbongolwane struggle to obtain them. To put this into perspective, transport from Eshowe to Mbongolwane is R140 for a return journey. To go to Durban is much worse as the return journey costs R360. If one hires a metered-taxi, the costs increase to over R500. These high costs serve as a barrier to many crafters and are pushing them out of the business.

5.4.2 Production

The Thubaleth'elihle Craft Group is the primary craft production organisation involved in the production and sale of craft at Mbongolwane. In addition to this, there are independent crafters who produce mats and other handmade articles for sale. Major craft products produced include sleeping mats, table mats, doormats, conference bags and beadwork. Craft production includes cutting ikhwane, pruning, drying and measuring it and sewing. During the cutting process, crafters cut the ikhwane at about 5 cm above base level. They then put the cut pieces in bundles for easy transport. The cutting process lasts the whole day. Following cutting, crafters would then trim the ikhwane according to its specific intended use. This also involves skimming out pieces that are unsuitable to use. This process also takes the whole day. After that, crafters would then dry the ikhwane which takes 3-4 days depending on the weather. After that, crafters would measure the ikhwane and cut it to equal length and also prepare the twine to be used to sew. This takes approximately three hours. The sewing process itself is tedious and takes between 1.5-2 days. Due to the lengthy nature of the overall process, crafters indicated that on average they make about 10 sleeping mats (main craft product currently) per month.

5.4.3 Craft utilisation and marketing

The demand for craft products is at the local level, regional and international level. Craft group members indicated that craft orders in the recent past used to come as far as Nkandla and eMpangeni and even abroad (Canada). However, at present the demand seems to be restricted to local level (within Mbongolwane) and regional level (Eshowe). For example, a craft shop (Crafts for Africa) at the Eshowe Fort indicated the willingness to buy product from the Mbongolwane craft producers. In addition, hawkers of craft products at Eshowe town indicated that they buy craft products as far as Mbazwana: they expressed the need to have a local crafter supplying them with products so as to reduce transport costs.

The marketing of crafts made by Mbongolwane crafters is through the Inina Craft Agency located at Eshowe. The Agency serves as a marketer of craft products around Eshowe, Ulundi, uThungulu district and the rest of Zululand. At the moment, Inina represents four crafts group which are Thubaleth'elihle, Ikhowe, Masibambane, and KZN Paper Making. As a result, orders come through Inina and then they delegate a certain number of products to be made by each craft group in contributing towards the order. On the profit made by each group, Inina would take 10% as a commission fee. When a customer has placed an order, a 50% deposit will be put into the bank account of the Inina and the remaining 50% would follow upon receipt of the products. The marketing of craft products is done through Skype, emails, exhibitions, and word of mouth.

Table 9: Craft value chain alignment

Drivers --→	The main driver of the craft value chain is the low input costs. The main craft making materials, ikhwane and umhlanga, occur naturally and as a result, the input costs in the craft value chain are the cheapest compared to all other value chains analysed in this document.	A major enabler in the craft value chain is the availability of training opportunities for crafters to perfect their craft. For example, an owner of Crafts for Africa shop in Eshowe indicated the willingness to train crafters at Mbongolwane in skills such as pricing strategy, market trends, and market development. Furthermore, Inina craft agency itself offer training in diverse areas of craft making such as in costing and pricing, product improvement, quality assurance, book-keeping and financial management. Another enabler in this value chain is the high demand for craft products. Another important enabler is the high demand for craft products especially at the local and regional levels. Craft retailers at Eshowe indicated that they struggle to find people to buy craft products from and as a result, they have to buy products from very far which significantly increase transport costs. They therefore expressed a dire need to have a local crafter supplying them with craft products.	Enablers --→
Barriers --→	There are a number of barriers in the craft value chain. The most serious barrier is the decline of the ikhwane owing to a variety of factors including the drying out of the wetland, encroachment of sugarcane fields into the wetland areas and increased dependency of livestock on the wetland. Another important barrier is the low availability of water in the wetland which causes ikhwane to have stunted growth and unsuitable for craft making. Late payment for orders is another barrier as it inconveniences crafters because late payment may constrain further craft production as they would not have enough financial resources to acquire inputs. The drying out of new orders especially those coming from outside of Mbongolwane is another barrier in the craft value chain. Lastly, another very important barrier in the craft value chain is the inoperability of the Inina Craft Agency due to the lack of a tax certificate. This is causing the whole chain to collapse since the Agency used to serve as a hub connecting producers with buyers.	An important regulator in the craft value chain is the fact that the majority of the crafters are old women and thus they work very slowly which limits the number of orders that may be delegated to them. This further limits the quality of their work which in combination reduces their productivity. Another regulator is the time-consuming process of preparing ikhwane to be used to make crafts. For example, the whole process of making one sleeping mat takes on average at least 7 days when done by one person. This is problematic because if craft products are not made on time orders are not likely to be made on time. Lastly, another important regulator is the lack of marketing which causes new orders to be hard to come by.	Regulators --→

5.5 Some observations on co-operative activities in Mbongolwane

5.5.1 Thuthukani Community Garden

Thuthukani agricultural co-op was established as a food security initiative, where community members (approximately 20 members) came together to produce food crops. The co-op is made up of women from the Mbongolwane community. The co-op owns a 5 ha garden, which is located within the wetland. The garden is fenced to protect crops from livestock damage. The community garden is run by committee members who are elected by the members. However, during the time of data collection, the co-op appeared to be encountering several management and operational challenges. The committee members were not easily accessible and there was no evidence of regular meetings to coordinate activities of the co-op members. Furthermore, the garden seemed to be in a state of neglect as evidenced by overgrown grasses and plenty of uncultivated plots in the garden. Although there is an electric pump that was installed to supply the garden with irrigation water, this was no longer operational owing to huge electricity bills and damaged pipes.

Crops produced by the group include carrots, beans, onion, cabbage, amadumbe, maize, beetroot, spinach, green pepper, sweet potatoes and peas. The group indicated that the majority of the crops produced are used for household consumption with a small portion sold for cash income. The group indicated that in the past, the garden used to be highly productive which even attracted tourists who came to buy crops from the garden. Although the issue of tourists was discussed it was the researchers' view that most of the tourists visited the craft centres in the area. It can be argued that the non-performance of the craft making business in the area negatively impacted on the number of tourists visiting the area.

The performance of Thuthukani community garden is also seriously affected by institutional issues around its location in the wetland area. Since 2010, the KZN Department of Agriculture and Environmental Affairs (KZNDAEA) at Eshowe were no longer giving any form of support to the project. This came after the Department of Environmental Affairs raised issues around the violation of wetland bye-law due to the location of the project in a prohibited area. The DAEA on the other hand responded by cutting extension services to the project (e.g. input subsidies, machinery, advisory services, etc.), though there still remains a gap on the policy as to which department has the right to stop the activities of the community garden. Furthermore, the challenge is to balance the food security objective for which the project was formed and the environmental requirements to conserve the wetland ecosystem.

5.5.2 Zamani Community garden

The Zamani community garden was formed with the same principle of food security as the Thuthukani community garden. Like the members of the Thuthukani community garden, members of the Zamani garden indicated that they use the garden under the authority of the garden committee. They also indicated that most of the crops they produced are used for household use. The group cited the lack of market opportunities as a reason they consume most of their produce (except on rare occasions when professionals from the area such as teachers, nurses, etc. come to the garden to buy). A closer analysis of the production system at Zamani community garden, it can be concluded that output is very low due to small pieces of land, restricted access to irrigation water and poor fencing of the garden. These are some of the real factors affecting production of any marketable surplus by the project members.

Unlike Thuthukani community garden, the location of the garden does not violate any environmental bye-law; hence the project members indicated that they have received input support in the form of seedlings and fertilisers from the DAEA. However, the respondents indicated that the frequency of extension visits is very low and its need to be improved. Unlike the Thuthukani community gardens, the Zamani group does not have any irrigation pump, hence the reliance on the bucket irrigation system to water their crops.

5.5.3 Philani Agricultural Co-op

This is a sugarcane producing co-op registered in 2013 and made up of 5 members. The co-op members brought their land together for collective farming and currently the co-op farms 25 ha. The medium- to long-term objective is to acquire 80-100 ha through negotiating with individual community members who own land to join the co-op and register their land under the Philani Agricultural Co-op. The acquisition of more land has proved to be a challenge for the co-op due to competition with Simamisa project, which is funded and managed by Tongaat Hulett and the government. Financial pay-outs are only expected after the harvesting and sale of the sugarcane. There are no guaranteed returns; hence farmers prefer to register their land under the Simamisa project where management and all inputs are provided by Tongaat Hulett. An overview of the operation and performance of the Philani Agricultural Co-op is presented in below.

5.5.4 Independent sugarcane growers

The value chain for the independent sugarcane growers is shown in Figure 8 below. This group appeared to be the most organised and have a ready market for their product, so the market is not a challenge.

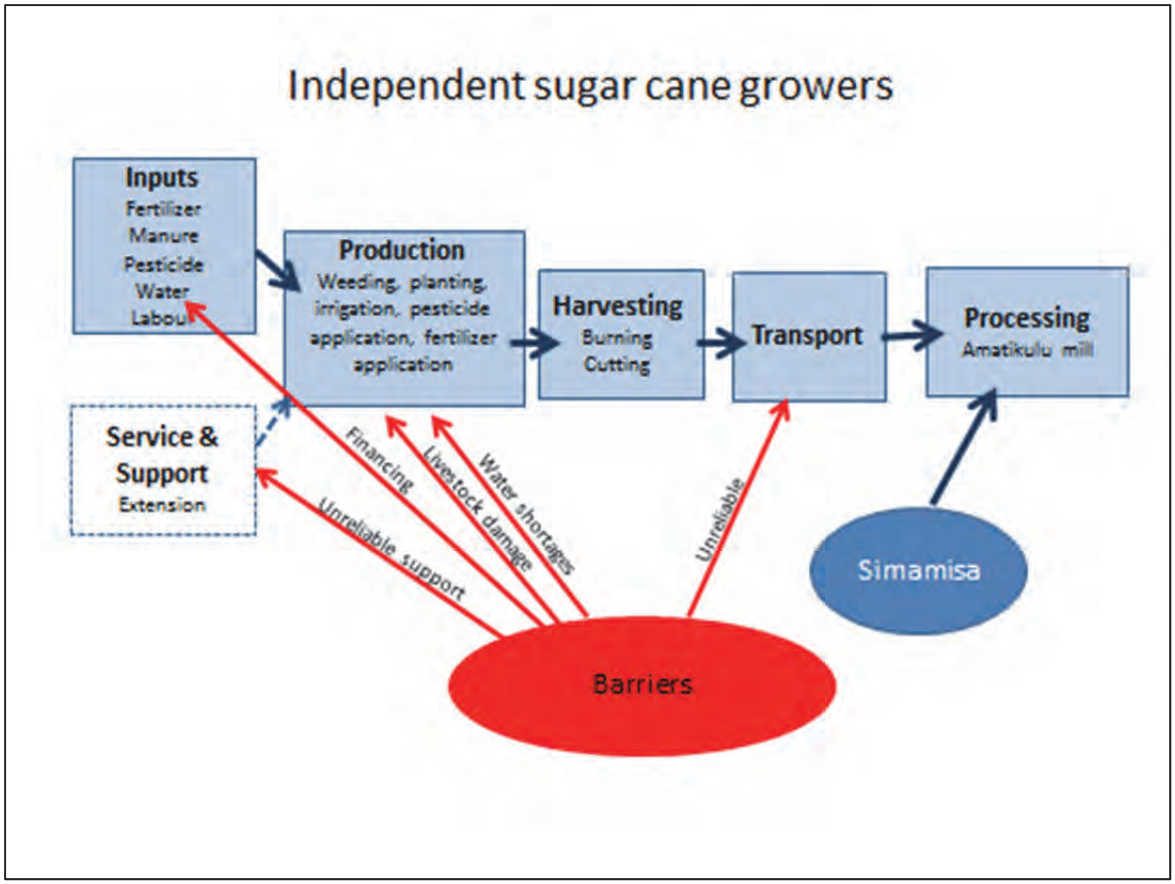

Figure 8: The value chain for independent sugarcane growers

As far as support services are concerned, sugarcane farmers suggest that they do not receive the extension support they are supposed to receive from the sugarcane industry through the Cane and Rural Development Unit. Financing for inputs was also highlighted as a constraint, although this can be addressed through Umthombo Agricultural Finance, which has been set up by the sugar industry specifically to assist small scale cane growers in this regard. Livestock damage was also highlighted as barrier by farmers, which suggest that there is conflicting demands for the use of land locally. Water shortages in the form of droughts were also highlighted by sugarcane farmers. From a processing perspective, the main challenge highlighted was that of unreliable transport.

Table 10: Sugarcane value chain

Activities	Description
Institutional support/management	• The co-op is currently operating independently without government support. • The co-op work with other stakeholders in the sugar industry including Tongaat Hulett, Canegrowers, South African Sugar Association (SASA), Umthombo Agricultural Finance; • The co-op also works with traditional leaders to ensure that access to farming land is procedurally correct in terms of traditional land allocation rules.
Production	• Seed cane is procured from Tongaat Hulett at R450-R550/tonne • They at times use their own sugarcane for seed due non-availability of the seedcane from Tongaat Hulett. The cane is however inspected by seedcane specialists from Tongaat Hulett before it can be planted. • Their cane establishment budget is currently at R16000/ha including land preparation, labour and planting activities. This is lower than the industry budget of R22000/ha. • The co-op reduces its costs by reducing the seed rate at planting. Furthermore, labour is paid at R70/day against R75/day paid to Simamisa contractors. The challenge is that Phillani Agricultural Co-op delays to pay its contractors (up to 3 months) and therefore, faces of challenging of getting labour. • Other costs include: Urea – 4 bags/ha; MAP- 3 bags/ha; Fertilising labour-3mandays; transporting inputs – R500-R2000/load of 80 bags from Eshowe town; • Average yield is 50-60tons/ha • A parcel of land (1.5 ha) is planned to be put aside for vegetable production, which is intended to provide cash flow support to the sugarcane enterprise.
Financing model	• Through stakeholder engagement, the Phillani Agricultural Co-op accessed finance from Umthombo Agricultural Finance for a maximum of 40 ha (at R16000/ha). • Tongaat Hulett was also prepared to subsidise smallholders with more than 3 ha at a rate of R2500/ha. However, this subsidy has not been received from Tongaat Hulett. • Extension support is paid for by Tongaat Hulett. However, the extension officers are biased towards the Simamisa project and less support is given to private individuals/co-ops.
Marketing	• All the sugar is delivered to Tongaat Hulett for crushing • The current price is R1700/ton (Recoverable Value) • Transport to the mill is charged per kilometre for a 35 ton long haul bell. Farmers were not aware of the exact rate per kilometre
Information flow	• The farmers claim that they are not consulted fairly on scheduling cane transport or haulage trucks. Furthermore, the system does not have mechanisms for farmers to claim refunds for any overcharging that might occur.
Other operational challenges	• Frequent drought is affecting yields, thereby negatively affecting the payment plan for the loan from Umthombo Agricultural Finance. The financier has not evaluated the impact of drought to ensure a revision of the payment plan. • Challenges of scheduling of planting and harvesting affects farmers' cashflows. At times planting is delayed due to shortage of seedcane or planting labour, which is beyond the control of the farmers. Furthermore, drought affects the growth of cane, and in some cases, cane ends up taking 24-36 months to harvest, thereby affecting the farmers' cash flow. • The farmers have also expressed concern over the quality of extension services especially from those trained at technical colleges like Mangosuthu University of Technology. These advisors are not as grounded as those from SASRI. • Due to financial constraints, the independent farmers are operating without budgets for drainage, bush clearing and limited budget for herbicides.

Table 11 Forces affecting the alignment of value chains in Mbongolwane.

Sector	Drivers	Enablers	Barriers	Regulators
Maize	High demand for maize Availability of non-tradable inputs	Use of technological advances (e.g. maize crushing machine	Low availability of water High costs of obtaining tradable inputs High transport costs for obtaining inputs and delivering produce	Lack of extension support from the provincial DoA Environmental regulations restricting farming on wetlands.
Dry beans	High demand for dry beans High profitability	Low non-tradable input costs	Lack of water Lack of knowledge about pesticide application High transport costs for inputs	Limited extension support High tradable-input costs High transport costs for products
Amadumbe	High demand for Amadumbe Availability of water-logged soils	Low input costs	High labour costs	Lack of value addition Lack of market
Vegetable	High demand for vegetables	Low input costs	Lack of water Livestock damage Lack of extension support Environmental regulations	Low productivity levels
Livestock	Livestock products demand	Low levels of livestock theft	Low water availability Lack of grazing area Insufficient extension services Livestock diseases	Lack of processing and sale of livestock products
Craft	Low non-tradable input costs	Training opportunities High demand for craft products	Low ikhwane availability Low water availability Late payment for orders Lack of marketing and coordination	Slow rate of production Low level of production

5.6 Market options and distribution channels for the Mbongolwane community

The wetland is the primary provider of the inputs into the value chains that were assessed. The production, processing, sale and consumption of these services vary in scale depending on the type of service and the location of the consumers/beneficiaries of the service. A market assessment of these prospective markets was undertaken to assess the scale and extent of the market. The outcomes of the market assessment were linked back to the estimated scale and extent of ecosystems services generated from the Mbongolwane wetland identified during the preliminary surveys.

There are opportunities for Mbongolwane community producers (farmers and crafters) to benefit from the surrounding markets in Eshowe town. As such, the possible relationship between producers and the market was evaluated against market demand for specific types of produce, distance from the farm to the market in which the product is sold and whether the types of produce demanded by the market can be produced under the existing conditions of the Mbongolwane wetland ecosystem. A broad overview of the potential markets for smallholders and the characterisation of the markets are summarised in Table 12.

Table 12: Potential market channels for fresh produce around the Mbongolwane community

Type of market	**Characteristics/Attributes**	
	Positive attributes	**Negative Attributes**
1.Informal markets (Community members, hawkers, bulk traders that are not registered, etc.)	The farmer is the direct seller of his/her produce The market is closer to production area There are no rules that the farmer needs to adhere to There are no specifications/regulations over quality or volumes to be produced	The sale of all produce is not guaranteed The market demand may not be great enough to sell all the produce The market is dependent on weather conditions The markets are vulnerable to theft Competition with other farmers can drive prices down Due to lack of adequate storing facilities (such as refrigeration) the produce can spoil and rot
2.Retail chain stores (Spar supermarkets, Saverite, Shoprite, Boxers, etc.)	They offer market related prices for the produce Payment is guaranteed If prior arrangements are made, sale of produce is guaranteed.	Large volumes of produce are required Mainly a market for top quality (Grade A) produce only Requires constant and consistent supply of product Have very strict regulation about volumes and quality Suited to large scale commercial farmers Are not close to smallholder farmers and will not collect the produce from farmers
3. Fruit and Vegetable Shops	Payment is guaranteed provided all the quality requirements are met. Bulk purchase provides a substantive market for the farmers.	They are not always ready to collect produce from the farms, hence their reliance on big municipal fresh produce markets.

5.7 Opportunities emerging from downstream users

Apart from the more conventional value chains described above, another opportunity was identified, namely the provision of incentives to encourage sustainable land use practices. Sugar is clearly a key industry in the whole Amatigulu catchment, accounting for the largest proportion of cultivated land in the catchment. There are many sugarcane farmers below Mbongolwane who require water for drinking, firefighting and other uses. The extent of water use by farmers downstream of Mbongolwane is still to be determined. Importantly, the Amatigulu Sugar Mill is located downstream of the wetland. In the last winter, the Amatigulu River stopped flowing. There has been low rainfall in the area, which is definitely a contributing factor, but what this highlighted was the importance of securing a stable water supply for the continuing operation of the Mill. When flow stopped, water had to be brought in by tankers at substantial cost from nearby farm dams to keep the mill operating. The drying of the river has prompted proposals to establish a dam on the Amatigulu River to ensure a sustainable supply of water.

In addition to this, the Amatigulu estuary is an important freshwater dominated estuary that also depends on a reliable supply of fresh water for the maintenance of the estuarine ecosystem. These two factors highlight the importance of ensuring a reliable and consistent flow of water downstream and, in the case of a dam being developed, reducing the risk of sedimentation in the dam. Thus there may be potential to investigate incentives for the community to manage the ecological infrastructure of the wetland more sustainably for the benefits of downstream users.

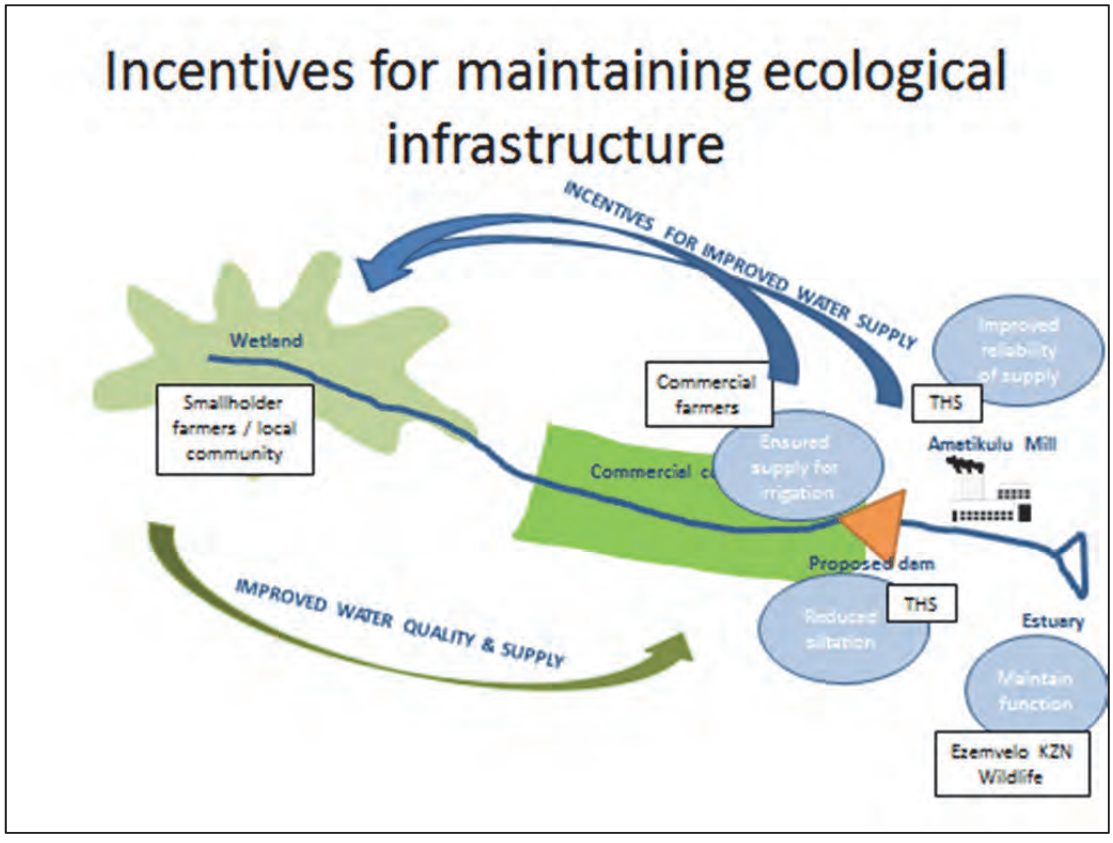

Figure 9: Considering incentives for maintaining ecosystem services for downstream users.

This concept needs to be explored further as part of this study and will probably require a more in-depth study to quantify the flow of ecosystems services and economic benefits within the catchment.

5.8 Framework of supporting value chain development in Mbongolwane

Table 13 below provides a summary framework of opportunities that have been identified, capacity building and institutional strengthening that is necessary as well as constraints.

Table 13: A framework for opportunities, constraints and interventions for identified enterprises

ENTERPRISE	OPPORTUNITIES	CONSTRAINTS	CAPACITY BUILDING/INTERVENTIONS	INSTITUTIONAL STRENGTHENING REQUIRED
Livestock	Marketing/offtake Improved health Improved production Improved management	Legal/legislative (related to use of wetlands, branding of livestock, etc.)	Sustainable use of wetlands to minimise trampling Manage dongas Introduce grazing systems (e.g. rotational resting and rotational grazing)	Strengthen dip tank committee and diversify their role in terms of livestock types and roles
Wetland cropping	Treadle/solar irrigation pumps Crop diversification Intercropping Rainwater harvesting (in drier transitional areas) Local marketing	Drought Livestock grazing in wetlands	Alternative production methods Crop system planning Support for local marketing	Establish a wetland cropping user group committee
Craft	Diversification of products Improved marketing	Lack of effective market linkages, training for new products.	Business and finances Sustainable harvesting Sewing training Designate areas of ikhwane for protection/management	Strengthen Inina Craft users need stronger voice for reversing the loss of resource
Cane	Possibility of THS contributing a percentage of gross turnover as an incentive for land management	Better management of sugarcane for higher yields	Application of SUSFARMS (especially related to fire) Identify alternative production areas in neighbouring catchments	Simamisa contractors need to be more accountable to local community

ENTERPRISE	OPPORTUNITIES	CONSTRAINTS	CAPACITY BUILDING/INTERVENTIONS	INSTITUTIONAL STRENGTHENING REQUIRED
Homestead cropping	Possibility of expanding food gardens with support from Simamisa	Concern that households have lost their homesteads fields to Simamisa but are not earning enough to replace the food they could have grown	Alternative farming methods: conservation agriculture/organic production Value-adding	Can be addressed through other user groups (do not need own committee)
Incentives for investments in ecosystem services	Dam, mill, estuary, downstream users	Contribution of wetland to streamflow (particularly low flows) is not well understood and requires further research.	Investigate value chain and water flow Application of SUSFARMS principles by large-scale producers downstream	Needs outsider to facilitate discussions with THS management and other downstream users

CHAPTER 6: PROPOSED GOVERNANCE STRUCTURE FOR MBONGOLWANE

Effective governance and institutions is a fundamental requirement for building capacity and local economic development. There are a range of stakeholders who should be involved in supporting the Mbongolwane community and the ecological assets within the Amatigulu catchment. Currently the governance arrangements are limited and the voices of wetland user groups are not being heard. Before proposing a governance structure, it is helpful to consider who the key stakeholders are and where their interests or obligations lie. An overview of these stakeholders is provided in Table 14.

Table 14: Overview of stakeholders and their potential roles in the management or use of Mbongolwane wetland

Stakeholder		**Objectives**	**Roles and responsibilities related to the wetland and related LED opportunities**
Private	Tongaat Hulett Sugar	• To support small-scale cane growers • To ensure a sustainable supply of cane to the mill	• Compliance with environmental legislation related to sugarcane production and wetlands • Social responsibility to build sustainable communities with sugarcane
	Simamisa (Service Provider)	• To provide on-the ground management and oversight of sugar cane production on communal tenure land	• To optimise and maximise sugarcane production • Limited involvement in the management of wetlands
Government	Department of Environmental Affairs (Including Ezemvelo KZN Wildlife)	• Sustainable use of natural resources, biodiversity conservation	• Protection of ecological assets and infrastructure • Enforcement of legislation protecting wetlands
	Municipality	• Local economic development • Facilitate provision of services and infrastructure	• To comply with national regulations and legislation • Assist where possible with generating value from the wetland
	KZN Department of Agriculture and Rural Development	• To support agricultural development in the province • To improve rural livelihoods	• Implement CARA and protect wetland and water resources • Develop rural areas through supporting income generating opportunities and creating rural safety nets.
	Department of Water and Sanitation	• Management of South Africa's water resources • Provision of sanitation and potable water	• Protection of water resources, including wetlands.

Stakeholder		Objectives	Roles and responsibilities related to the wetland and related LED opportunities
Community	Traditional Authority	• To manage and allocate land resources within its area of jurisdiction • Maintain traditional norms and standards within the local community	• To ensure equitable access to the benefits from local wetland resources • To manage all land under its jurisdiction for the benefit of all who live there
	Forum representing user groups	PROPOSED STRUCTURE	• To communicate the needs of different user groups to Traditional Authority and other stakeholders such as THS, Simamisa and government • To facilitate reasonable and equitable use of the resource for all user groups • To build local capacity • To lobby for funding support for identified initiatives
	User group structures	PROPOSED STRUCTURES	Represent the needs of various user groups using or impacting on the Mbongolwane wetland, with specific areas of responsibility: • Livestock: Herd management and grazing (possibly building on dip tank association) • Wetland croppers (independent and community gardens): Managing livestock damage, finding effective ways to address the water challenge, encouraging sustainable land use practices • Crafters: Management of plants used as raw materials, support regarding marketing of products • Homestead croppers: Introduction of more water-efficient production practices, crop diversification and marketing, access to land for food crop production • Independent cane growers: support for production and transportation to the mill

A proposed structure for the various stakeholders to engage is provided in Figure 10. From a wetland user perspective, the different user groups would need to be supported to establish or further develop existing structures where possible. For example, livestock owners could be represented though dip tank associations and crafters do have an association. Other local stakeholders that potentially impact on the wetland should also be included, such as sugarcane farmers and crop producers outside of the wetland. These would be represented through a forum that should meet at regular intervals through the traditional authority.

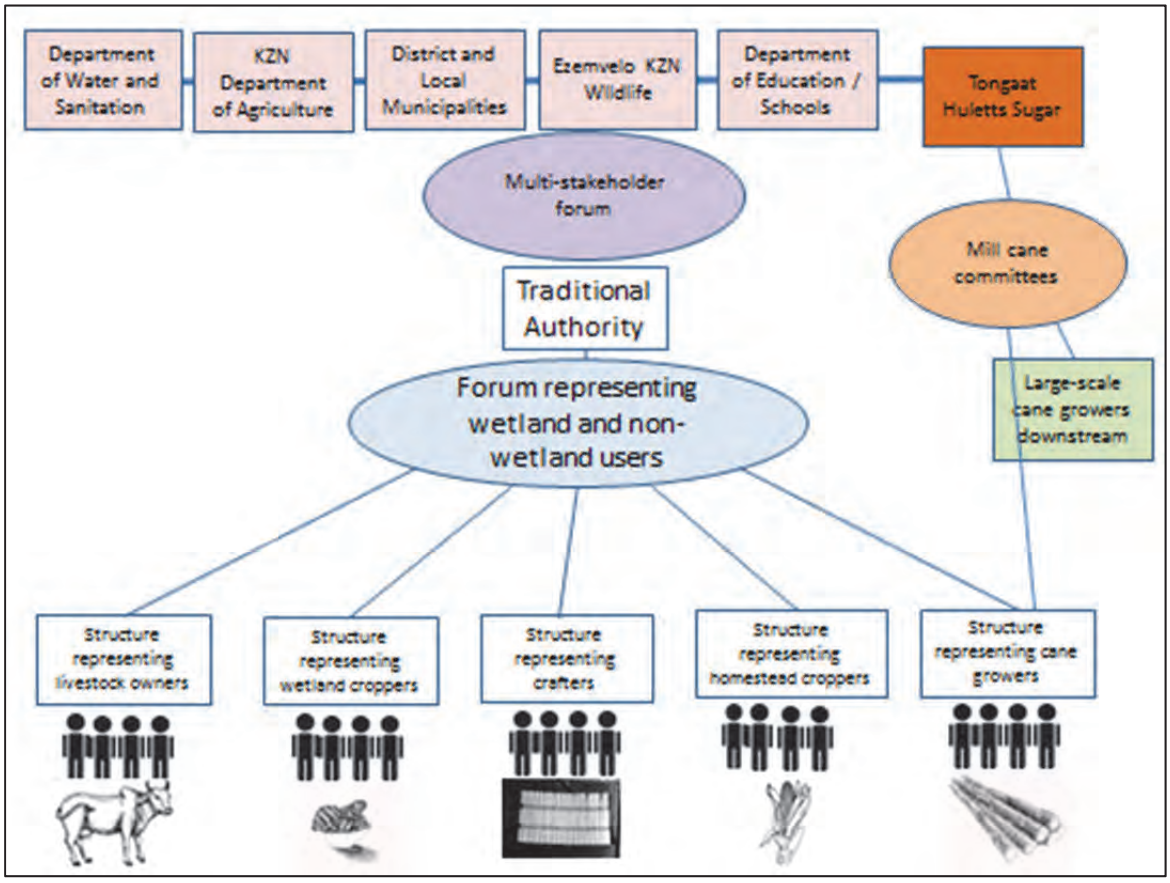

Figure 10: Proposed governance structure to represent wetland users

A broader multistakeholder platform is also necessary to represent catchment wide interests. From a government perspective, this would include Municipalities, DEA, DWS, provincial DoA, while the private sector, such as THS and other water users could also be represented. The exact structure of this platform requires additional discussion with stakeholders, but could be in the form of a Catchment Management Forum, or could be part of a Municipal Environmental Management Framework (EMF).

Considering the key stakeholders and organisations have been identified and value chain development opportunities at Mbongolwane a conceptual flow of networks and relationships has been presented in Figure 11 below.

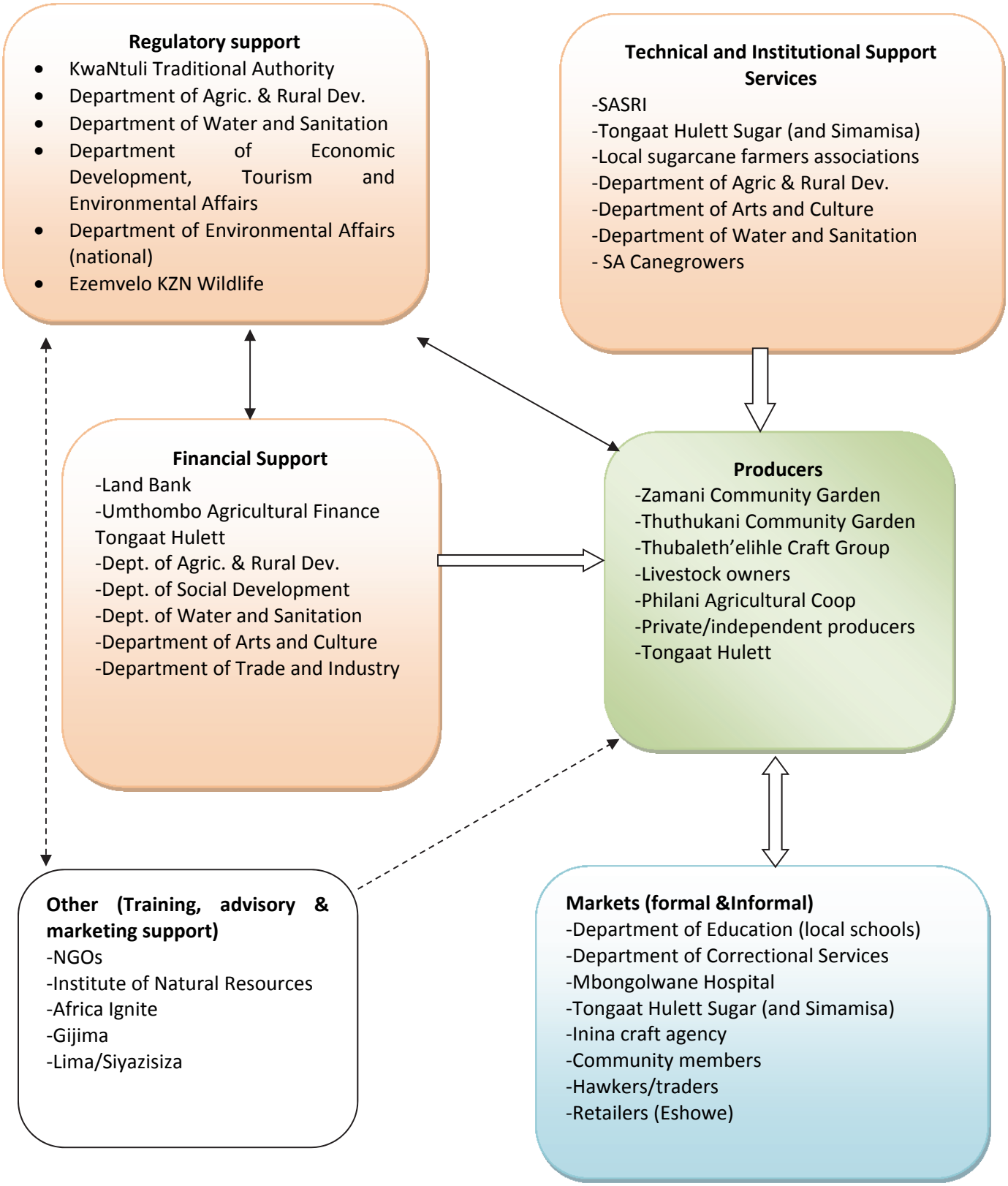

Figure 11: Networks and relationship flows for proposed governance structure

A range of options for a governance structure should focus on stakeholder integration, both, horizontally and vertically. Horizontally, a shared view and acceptance of how and what communal resources are used and how the benefits are accrued and distributed among community members is essential for long-term sustainability of any initiative. Integration across representatives of the various sectors (conservation, agriculture, water, etc.) who have influence/jurisdiction over any initiatives in the area is also key in overcoming the negative consequences of the sectorial approach discussed in the terms of reference.

Vertically between the community and the various external links, there is need to strengthen the value chain and governance framework. The structure should be designed to ensure that the initiatives which are developed are legally compliant by liaising with the agencies responsible for resource management and regulatory support in relation to the relevant Acts and policies, e.g. the Departments of Agriculture, Water Affairs, Environmental Affairs (provincial and national) and the conservation authorities. The appropriate representatives of these agencies should be identified and a level of relationship and mechanism for engagement should be established.

A multistakeholder coordination forum is therefore proposed, which should be chaired and funded by one of the regulatory authorities (Figure 11). Through drafting of regulatory and management frameworks, general authorisations and licencing of the multiple uses of the wetland should form the basis of sustainable management of wetland ecosystem in Mbongolwane and other similar environments. Specific possible areas of intervention have been noted.

CHAPTER 7: PROPOSED INTERVENTION STRATEGIES

Based on the analysis conducted, a number of interventions have been identified for developing livelihood opportunities while maintaining the supply of ecosystem services. These are discussed below.

7.1 Environmental conservation

Based on the information gathered from this study, the wetland in Mbongolwane seems to be under significant pressure from a diverse array of users. The observations by respondents on the drying of the wetland in the long-term suggest changing wetland condition and function. While there is current a drought in the area, there are a number of additional factors that could be contributing to this situation. These are discussed in more detail below.

Firstly, the fact that water is abstracted directly from the wetland suggests that water abstraction may be impacting on the structure and functioning of the wetland.

Secondly, there has been an increasing need for the use of the wetland for livestock grazing. In the past, livestock grazing was restricted to the winter season but currently, livestock utilise the wetland year-round. A common theme among livestock owners is that their livestock depend so much on the wetland of late because of sugarcane field expansion in the area which reduces grazing land. One way to minimise these impacts would be to introduce sustainable grazing systems (e.g. rotational resting and rotational grazing) to minimise trampling. Furthermore, dip tank committees would need to be diversified in terms of roles and livestock types.

Thirdly, sugarcane fields are also encroaching into the wetland. Given the high likelihood of the intensification in sugarcane field expansion in the area through the Simamisa Project, this suggests a dire need for enacting management interventions to prevent wetland degradation. An institutional framework drawing from various stakeholders needs to be drawn to ensure the long-term sustainability of the wetland. With regards to the impacts imposed by sugarcane, the Sustainable Sugarcane Farm Management System (SUSFARMS) guideline needs to be adopted. This is especially the case since there is a suspicion from the community members in Mbongolwane that managers from the Simamisa initiative burn the wetland purposefully so that they can encroach into it. Another option to reduce negative impacts by sugarcane operations on the wetland would be to try to find alternative production areas in neighbouring catchments. These production areas would need to be strategically selected such that the environmental conditions match the sugarcane breed so as not to compromise production. Lastly, the application of SUSFARMS principles by large-scale producers downstream needs to be enforced to reduce any negative impact on the environment. This is because Mbongolwane wetland feeds into the Amatigulu Estuary which is an important site for tourism. All of this hinges upon the Simamisa contractors becoming more accountable to the local community.

There is need to establish local natural resource management committees that can oversee the harvesting and utilisation of wetland resources in the community. Traditional authorities should form an integral part of the regulatory framework, monitoring and compliance enforcement at local level. Business proposals that seek to enhance natural resource utilisation should be explored, bearing in mind the positive impact such initiatives would have on local sectors for example craft and agricultural production, as well as downstream sectors (e.g. Amatigulu mill and the Amatigulu estuary).

Scientific investigations should be carried out to come up with criteria to determine which enterprises can best be carried out in the Mbongolwane wetland system, without compromising the sustainability of the system. Such investigations should encompass aspects like discharge of the

wetland, regeneration capability, species diversity, pollution and possible bye-laws that can improve utilisation of the wetland system. The recommendation of such studies must contribute towards best management practices of other wetland systems across South Africa.

7.2 Water utilisation

The current situation in Mbongolwane does not have accountability measures in place, especially regarding water use. There are no water management structures such as Water User Associations, which are supposed to be in place given that water is used for production purposes. Mechanisms to protect or conserve the natural water sources (e.g. springs) should be identified for long-term sustainability of the Mbongolwane Wetland Ecosystem. Stricter water budgeting should also be considered. Given that many respondents have indicated that the wetland is drying out, research is required to determine if this is the case and if so, what is the cause (e.g. abstraction, drought, encroachment of crops, loss of ecosystem services, etc.).

7.3 Performance and market coordination

Value chain interventions are focused on improving vertical linkages along value chains (in production, processing and trade functions) with the view of improving the functioning of the value chain and/or terms of participation of selected beneficiaries. Interventions may be targeted at local, regional or international value chains.

There is no organised market for both crops and livestock value chains in Mbongolwane community, but the individual producers coordinate their own activities in terms of marketing agricultural goods. In the case of craft, the committees negotiate prices, communicate with potential buyers and create awareness among group members and warehousing of the orders. A marketing agency like Inina Craft Agency (for crafts) supports producers under their associations to market their produce through planning and ensuring that there is access to markets. Traders themselves also ensure that they have adequate information on their products thus coordinate activities by themselves. Other potential key players are the local government departments (e.g. Department of Agriculture and Rural development, Department of Basic Education) whose current involvement in local value chains is minimal to none.

7.4 Value chain development

7.4.1 Agriculture

From all the crop value chains analysed, it became apparent was that the major constraining issues were at the input and production level as most producers struggled with procuring inputs and had low levels of primary agricultural production. This suggests that any intervention that needs to occur should target the inputs and management of primary production. One way to alleviate this issue and make crop production accessible to a wider section of the community is to support low external input agriculture (e.g. ecological farming). These methods save significant input costs as it does not rely on industry-produced fertilisers. Furthermore, this method allows the soil to regenerate its nutrients naturally through nutrient cycling. This reduces pollutant loading in the soil.

Another approach would be to engage in value-addition. Most crops in Mbongolwane do not undergo any value addition which tends to limit the options available to farmers. The example of a farmer (Mr Mbatha) who uses the maize-crushing machine (Box 1) is an example of how value addition can reduce costs as farmers can use produce for a variety of purposes. Other options to consider are value addition of crops through processing. An example of this is the production of chips from amadumbe.

Other interventions that are required include: establishing crop user group committees so that producers within the same community group do not produce the same crop so as to reduce

competition between producers; providing support for local marketing so as to create a local market; introducing treadle/solar irrigation pumps to solve the water issue; intercropping to maximise production within the available arable space and engaging in rainwater harvesting (in drier transitional areas) to increase dry land production.

Most farmers finance their own value chain activities (input procurement, planting, maintenance costs, marketing, etc.). Farmers have limited access to bank credit as well as special project financing due to low levels of production, lack of collateral and poor coordination of the value chain activities by producers in Mbongolwane. This also applies to transporting of produce to markets especially when the producers deliver on their own.

7.4.2 Craft

One strength of the Mbongolwane community is to produce crafts for sale. This has proved to be viable in the past, with a potential to attract tourists and exports to as far as Canada. Proper funding models and market development initiatives are required to resuscitate the sector. Training and institutional support is required so that Inina Crafting Agency regains its status as a leading exporter of locally produced crafts.

From the craft production perspective, constraints to value chain alignment occurred all along the value chain suggesting that interventions should occur at various levels of production. One key constraint that was observed was the drying out of new orders. This could be attributed to two major factors. The first one is that there is a lack of marketing of craft products within Mbongolwane and outside. This is primarily due to the fact that Inina Craft Agency, which served to do the marketing and administration of orders, is inoperable. This has caused a disjunction between producers on one hand and consumers/customers on the other hand. The second reason for the reduction of orders is the narrow range of products produced by crafters. It was learnt during the course of this study that currently the major craft products produced in Mbongolwane are sleeping mats, doormats, tablemats, conference bags and beadwork. This is a very narrow range of products and these are rarely on demand on the outside market. This may be due to that the availability of other craft materials in the area (e.g. *Aristida junciformis* (Ngongoni) and *Eragrostis plana*) have declined substantially. The major interventions required in the craft value chain include the following: train crafters in new set of skills (e.g. sewing) to help with the diversification of craft products so as to attract a diverse range of customers; improving the marketing of craft by resuscitating the Inina Craft Agency or establishing a similar organisation; group craft producer groups in terms of product specialisation so as to effectively handle orders; providing business and personal finance training to crafters so as to be able to sustain themselves when orders are not coming by and designating areas within the wetland for ikhwane (or any other craft material) protection.

7.5 Extension support

Government extension services to farmers are perceived to be inadequate. Extension sought by farmers is mostly in the form of crop management and storage as well as access to government subsidy programs (seeds, chemicals, finance, etc.). Others include financial management and leadership especially for farmers in co-operatives and associations. Others are on disease control, chemicals, marketing, among others. But extension is reported to be focusing mostly on the main traditional crops (maize, cabbages, and spinach) other than beans and crafts. NGO extension is also limited for most farmers in Mbongolwane. Due to limited resources, NGOs can use the lead farmer concept, where targeted training is offered to team leaders in the communities, who are trained to impart the knowledge to other producers. This capacity building approach should aim to address issues across farming such as production, post-harvest, marketing and other cross cutting issues such as environmental conservation in the area.

7.6 Discussion

From the value chain analysis and interviews with stakeholders, a clear theme is that almost all respondents indicated that the wetland is drying out. At this stage is it not clear whether this is due to low and erratic rainfall, degradation and drainage of the wetland or a combination of these factors.

From a crop production perspective, marketing of crops is not a problem. The challenge is producing sufficient quantities to market, the major problem being a lack of water to irrigate the crops. This is an ironic and concerning situation for a wetland farmer to face. Communal farmers in the wetland face challenges of lack of infrastructure (fencing in particular) as well as an increasing problem of damage by livestock. Lack of extension was also highlighted as a problem.

Independent sugarcane farmers seem to be the best off of the user groups interviewed. While sugarcane is not a direct use of the wetland (i.e. it is not planted in the wetland), the expansion of sugarcane may have implications for the water balance in the wetland.

An effect of the expansion of sugarcane production in the area may be that food production is declining and therefore farmers who put their land under sugarcane would need to purchase food that they would have in the past produced themselves. This requires further investigation to determine the changes in land under sugarcane production over time to evaluate how production has changed and what the implications are for food security.

The expansion of sugarcane has also had an impact on livestock owners – lack of grazing locally has been attributed by livestock owners to the expansion of sugarcane production in the area. As with the wetland farmers, livestock owners also suggest that the wetland is drying out.

A lack of communication between Simamisa and farmers who are leasing land seems to be an emerging problem as some farmers who have leased land have indicated disappointment with income received from Simamisa. While many respondents have highlighted disappointment with Simamisa, it should be borne in mind that there are indirect benefits that accrue from such programmes, such as the generation of employment and multiplier effects that result from this. This will be evaluated when data have been made available from THS regarding the extent of area under production. Given that Simamisa is providing extension support to sugarcane, it may be possible that they could also provide extension support to crop producers to assist with increasing food security in the area.

From an institutional perspective, it has become apparent the TA is failing to resolve conflicts between stakeholders over wetland use. This suggests a declining role of the TA as well as the decline in the organisation of different stakeholder groups making use of the wetland. This is compounded by the lack of involvement of state agencies, such as the Umlalazi Local Municipality, and the Department of Agriculture and Rural Development. The proposed governance arrangements consider both a ‘bottom-up’ structure for wetland users as well as a ‘top down’ platform for broader catchment interests on which local users can be represented is proposed.

This report has explored value chain opportunities considering provisioning services in the form of agriculture, considering crop and livestock production as well as the use of harvestable natural resources in the form of craft.

The importance of regulating and supporting ecosystem services have also been highlighted and explored as it has become apparent that streamflow regulation, particularly the supply of winter flows are important for the Amatigulu Mill and the Amatigulu Estuary. Furthermore, should a dam that is being proposed for the Amatigulu River be built, reducing siltation will become important. The Mbongolwane wetland can contribute to all of these needs if managed correctly.

The greatest challenge has been identifying market opportunities for the provisioning services. Agricultural production is primarily for home consumption, although markets seem to be readily available. Here the focus should be on improving production through investment in infrastructure for water and in skills development. From a craft perspective, the market does appear to be the greatest challenge, which still requires more investigation to establish viable market options for these resources.

The importance of the regulating and supporting services does present opportunities, but the value of these would require more in-depth investigations to assess the flow of services and the demand therefore.

From a governance perspective, a structure for more effective governance has been proposed. This was discussed at two stakeholder workshops and was accepted in principle by workshop participants.

Actions to take these recommendations forward are proposed in the second document making up this report, namely the business plan for Mbongolwane wetland resources, ecosystem services and value chain.

CHAPTER 8: BUSINESS PLANS FOR MBONGOLWANE

The development of this business plan was informed by a review of literature on the Mbongolwane wetland, field research conducted at Mbongolwane investigating in particular value chains for natural resources from the wetland and stakeholder workshops where the outcomes of the field research was presented to stakeholders to obtain their input into the development of the business plan.

Based on the research, a number of key concepts and principles were identified that inform the development of the business plan. These are discussed below.

- Water

The availability of water was an overriding concern for all stakeholders. Those using the wetland directly suggested that the wetland is drying out. For downstream users, in particular the Amatigulu mill, water supply is a major concern. In the winter of 2014, the Amatigulu River stopped flowing – the first time in living memory. While this needs to be considered in the context of the current drought, changes in land use surrounding the wetland as well as abstractions from the wetland and a decline in wetland structure and function may also be contributing factors. More detailed research is necessary to determine what the main causes are.

- Ecosystem services

The concept of sustaining or ecosystem services is receiving increasing global attention. Maintaining and improving ecosystem services is critical for sustained benefits for the socio-economic development of local and downstream users. Furthermore, wetland – terrestrial system linkages cannot be ignored. Changes in land use in areas adjacent to the wetland impact on the productivity and ecological functioning of the wetland. Sugarcane in particular is an important commodity in the area – this has indirect and direct impacts on the wetlands, which need to be investigated to assess long-term impacts.

- Value chains and enterprise development

The value chain approach which describes the range of activities to bring a product from conception, through the different phases of production to delivery to the final consumer, has been used to identify where interventions should be focussed to enhance socio-economic development. Markets are the starting point for value chain development and feasible markets for products from the wetland are the starting point for the business plan. As far as markets are concerned, the approach has been to focus on local markets first and work outwards from there. In the case of agriculture, formal markets for fresh produce located in Eshowe and further afield are difficult to access for farmers. The costs of transport and low levels of production often mean that farmers are not cost-competitive. Furthermore, consistency in supply and quality, which formal markets require, are often difficult to achieve.

It is also necessary to realise that current levels of agricultural production from the wetland (and adjacent areas) do not meet household food requirements. Where feasible, value addition should be considered, however the starting point is increasing primary production.

Enterprise development in relation to livestock has been excluded. The barriers to establishing livestock as a commodity are significant and include social, technical and institutional barriers. It is acknowledged, however, that livestock are a challenge for cane farmers, wetland farmers and crafters. Consequently a management plan for livestock is required.

- Training, support and mentorship

There are substantial capacity constraints within the Mbongolwane community in terms of technical ability, institutional and governance capacity. A fundamentally developmental approach is therefore required. Long-term support, training and mentorship are necessary to realise effective enterprise development associated with Mbongolwane wetland. This requires grant funding and support from state and other donor funded programmes.

- Governance and regulations

Effective governance of the use and management of the wetland is necessary to ensure equitable, sustainable use of its resources. Current legislation prohibits wetland agriculture without the necessary permits. However, farmers will continue to farm the wetland, regardless of legislation limiting this. The research found that the highest proportion of people deriving benefit from the wetland are those engaging in agriculture.

Ensuring that benefits flow from the wetland creates incentives for better governance and management. It is therefore necessary to develop opportunities to realise benefits for local users. The participation by various organs of state in supporting the Mbongolwane community is critical, although it is acknowledged that the capacity of many agencies at a local scale is severely constrained. This means that support requires participation of both the state and development practitioners, primarily non-government organisations (NGOs) and pro-poor market players. Finally, governance should be a bottom-up process. User groups making use of the wetland should have the authority and take responsibility to manage the wetland resource with support from various organs of state and NGOs.

The purpose of the business plan is as follows:

1. To develop and explore value chain opportunities for the natural resources of Mbongolwane wetland for local socio-economic development.
2. To enhance the sustainable management of the Mbongolwane wetland for the continued provision of ecosystem services.
3. To recommend further investigations to quantify the ecosystem services provided by the wetland and identify the users (market) for the ecosystem services.
4. To provide a framework to guide stakeholders to work collectively to support socio-economic development of the Mbongolwane community while sustaining wetland ecosystem services.

The business plan focusses on four themes, namely agriculture, craft, the wetland ecosystem and governance. For each of the themes, a description is provided of the key issues and activities necessary to address the relevant challenges identified. In addition, draft terms of reference and a notional budget are provided.

8.1 Business plan 1: Support for agricultural value chains

Four agricultural crops were identified for support. These were crops for which there was a high local demand and where opportunities for marketing were available. The selected crops, their drivers and enablers and barriers and regulators, are summarised in Table 15.

Table 15: Crops identified for further development

Crop	Drivers and enablers	Barriers and regulators	Cross-cutting barriers and regulators
Maize	Large, established local market; demand exceeds supply. Processing opportunities (e.g. maize milling).	High costs and difficulty in procuring of inputs.	Environmental legislation restricting wetland farming Lack of extension support High transport costs and difficulty procuring inputs Old age profile of producers
Dry beans	Established local market; high value/profitability; demand exceeds supply; low water requirements; manure as a low cost input for production	Drying of wetland limits water for production – negative impacts on growth; insect pests; procurement of inputs; lack of extension support; low retail price of beans on the formal market; high transport costs to markets in Eshowe.	
Amadumbe	High local demand; wetland an ideal production site for amadumbe; few inputs required, cutting cost of production. Opportunities for value addition should be considered.	High labour requirements – land prepared and planted by hand; lack of processing and value addition.	
Cabbage	High local demand for vegetables; year round demand; relatively low input costs	Lack of water; livestock damage (fencing); pest and disease control; low production levels	

8.1.1 Support required

8.1.1.1 Inputs and production

Securing of inputs for cabbage, beans and maize is a challenge for most farmers. This can be attributed primarily to distance from the nearest source of inputs (Eshowe), lack of coordination between farmers and a lack of knowledge of required inputs (especially for pest and disease control). Collective procurement of inputs through buying groups can effectively address the cost of inputs and their transport.

From an agronomic perspective, farmers should be supported to develop better low external input production systems, including:

- Pest and disease control using natural/low cost remedies.
- Irrigation, water harvesting and water conservation technologies.
- Intercropping with the inclusion of legumes (fertility and pest and disease control).

To achieve this, farmers primarily require training and mentorship for better production practices.

8.1.1.2 Marketing

There exists substantial local demand for the crops listed in Table 15. Marketing should first focus on meeting local demand. Individual and collective marketing of crops should focus on pension pay-out points, taxi ranks, the Mbongolwane hospital, local stores and schools. Once local demand has been met, marketing opportunities further afield, for example retailers in Eshowe can be considered. However, it will be necessary to produce consistently and efficiently to compete with fresh produce transported in bulk to Eshowe from Municipal Markets, such as Durban.

8.1.1.3 Value addition

There are limited value add opportunities for dry beans and cabbage, however, the high demand and value of these crops should be sufficient to generate adequate income for growers, if input and production factors are addressed. Value addition opportunities for Maize and Amadumbe are as follows:

8.1.1.3.1 Maize

Milling of maize for maize meal and samp should be supported. This will require the identification of a business-focussed farmer who can mill maize for a fee, or purchase whole maize grain and sell the value added products to local markets.

8.1.1.3.2 Amadumbe

Opportunities for the manufacture of amadumbe chips were investigated in this short-term consultancy, but no examples of successful amadumbe chip operations were identified[3]. Further investigation into the feasibility of amadumbe chip production is necessary to better understand the opportunities associated with this value added option.

8.1.1.4 Extension and mentorship

Extension and mentorship support for the production of these crops should be provided through NGO support, THS and Simamisa (sugarcane growers in the area) and through the KZNDARD. Support should focus on agronomic production, testing different cultivars for production, and water efficient production systems (e.g. mulching, micro-irrigation, rainwater harvesting).

8.1.2 Possible partners and funders

The following possible partners and funders should be considered:

- Department of Agriculture, Forestry and Fisheries (DAFF) and its provincial counterpart, KZNDARD. These government Departments should provide support for infrastructure (e.g. fencing and irrigation) and also extension support for agronomic aspects of production.
- Simamisa and Tongaat Hulett Sugar (THS) – To secure the supply of sugarcane to the Amatigulu Mill, THS has established Simamisa, which is an implementing agent supporting Small Scale sugarcane growers in Mbongolwane. Simamisa leases land from small growers through the establishment of land holding cooperatives and pays a rental to lessors of 10% of revenue generated. This initiative is in partnership with the KZNDARD, who are seeking more local benefits to farmers from the initiative. There is an opportunity to leverage support for the support of existing agricultural gardens and possibly the establishment of new gardens through this programme.

[3] Queries were submitted to the University of KwaZulu-Natal (Prof Albert Modi) KZN Department of Agriculture and Rural Development (KZNDARD), the KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA) and the Council for Scientific and Industrial Research (CSIR), all of whom have in the past, or currently, been involved in Amadumbe value addition.

8.1.3 Target groups

Support should focus on independent wetland farmers and the two community gardens that farm in the wetland, namely Zamani and Thuthukani community gardens.

8.1.4 Draft terms of reference for interventions

The Mbongolwane wetland is an important resource for the production of food crops and contributes to meeting household food security requirements. Current yields of crops produced from the wetland are low and wetland farmers lack the necessary knowledge and skills to farm effectively. Farmers require capacity development and support to improve their production practices to move beyond subsistence production and to market surplus production. Substantial local markets exist for important crops growing in the area (maize, dry beans, cabbage and amadumbe).

Main activities required:

- Engage with the KZN Department of Agriculture and Rural Development, other state agencies and any other organisations who can provide support to agricultural production.
- Evaluate the water use productivity of the identified crops by comparing water use of cropping in the wetland agriculture with cropping in terrestrial areas adjacent to the wetland.
- Assist farmers with organising buying groups for collective action for inputs and production.
- Training and extension in agronomic production practices, focussing where possible on low external input systems including pest and disease control, water efficient production methods (irrigation, water harvesting and water conservation). Assistance with agro-ecological practices, for example, intercropping, legumes.
- Develop collective land management plan for wetland agriculture to ensure the sustainable functioning of the Mbongolwane wetland.
- Provide farmers with support for collective marketing of produce, including setting of pricing, collective marketing and quality control.

Table 16: Notional budget for agricultural support (Duration: 3 years)

Activity – agricultural support	Cost			
	Year 1	Year 2	Year 3	Subtotal
Engage with the KZN Department of Agriculture and Rural Development, other state agencies and any other organisations who can provide support to agricultural production.	100,000			100,000
Evaluate the water use productivity of the identified crops by comparing water use of cropping in the wetland agriculture with cropping in terrestrial areas adjacent to the wetland.	80,000	120,000		200,000
Assist farmers with organising buying groups for collective action for inputs and production.	40,000	60,000	30,000	130,000
Training and extension in agronomic production practices, focussing where possible on low external input systems including pest and disease control, water efficient production methods (irrigation, water harvesting and water conservation). Assistance with agro-ecological practices, for example, intercropping, legumes.	100,000	100,000	80,000	280,000

Activity – agricultural support	Cost			
	Year 1	Year 2	Year 3	Subtotal
Develop collective land management plan for wetland agriculture to ensure the sustainable functioning of the Mbongolwane wetland.		120,000		120,000
Provide farmers with support for collective marketing of produce, including setting of pricing, collective marketing and quality control.	30,000	60,000	30,000	120,000
			Grand total	**950,000**

8.2 Business plan 2: Feasibility and piloting of amadumbe chip production

Given the popularity of amadumbe production in Mbongolwane and its high suitability to cultivation within the Mbongolwane wetland, it is proposed the more detailed investigations be conducted into the feasibility of value addition of amadumbe by manufacturing fried amadumbe chips. It is anticipated that the value addition of primary agricultural goods, such as amadumbe, have great potential to draw the youth into the agricultural value chain.

8.2.1 Investigations required

The following investigations are necessary to determine the feasibility of amadumbe chip production:

- To properly assess the feasibility of large scale production of amadumbe chips, it is necessary to first review previous initiatives to produce amadumbe and similar vegetable-based chips (e.g. sweet potato and butternut chips). Previous initiatives to produce chips, such as those of the CSIR and KZN DED should be investigated to understand the major challenges encountered in these projects and how they can be successfully overcome.
- In addition a market analysis to assess the marketability of amadumbe chips produced in Mbongolwane will be required. This will require engaging with various retailers and distributors to understand the scope of the market. Included in this assessment should be an analysis of consumer preferences regarding amadumbe chips.
- Production trials using different varieties of amadumbe will be necessary to determine the production characteristics of the varieties and their suitability for use in the production of chips.
- Pilot chip production factory. A mini production factory should be established where the testing and piloting of chip production by the local community can be evaluated. The chips produced at the mini-factory can also be used to test the market's preferences regarding amadumbe chips. Other chips (e.g. sweet potato) could also be tested at the mini-factory.
- Determine the feasibility of production and if found to be feasible, develop a full business plan for expansion of production of amadumbe chips.

8.2.2 Possible partners and funders

The following possible partners and funders should be considered:

- Central African Seed Services – this organisation has extensive experience in manufacturing and value addition of crops produced by small-scale farmers and has worked throughout southern Africa.
- University of KwaZulu-Natal – Prof A Modi and Dr T Mabhaudi have conducted extensive research on amadumbe production and can provide technical support.
- DAFF and KZNDARD – agricultural support to primary production and for value adding can be provided by the Department,

- KZNDEDTEA – the economic development department has programmes supporting manufacturing and value addition that could contribute to establishing and supporting manufacturing facilities.

8.2.3 Target groups

The primary target group for the chip production would be local youth who have an interest and aptitude for value addition and manufacturing. In addition, primary producers of amadumbe in the wetland would also be supported.

8.2.4 Draft terms of reference for interventions

Value addition of primary agricultural produce has the potential to attract the youth into agricultural value chains, while increasing the local primary production of agricultural goods to supply value addition facilities. Amadumbe (*Colocasia esculenta*) are a popular cultivated food in the Mbongolwane wetland and the feasibility of manufacturing amadumbe chips requires further investigation. The following research activities are necessary to determine the feasibility of manufacturing amadumbe chips at Mbongolwane:

To assess previous initiatives to produce amadumbe chips (e.g. CSIR and KZNDEDTEA) and to learn lessons from these initiatives regarding the major challenges and how they can be overcome.

- Conduct a market analysis to assess the marketability of amadumbe chips produced, including engagement with various retailers, manufacturers and distributors to understand the scope of the market. Included in this assessment should be an analysis of consumer preferences regarding amadumbe chips.
- Establish production trials using different varieties of amadumbe to determine the production characteristics of the different varieties and their suitability for use in the production of chips.
- Establish a mini production factory in Mbongolwane for the piloting of chip production by the local community. The chips produced at the mini-factory can also be used to test the market's preferences regarding amadumbe chips.
- Determine the feasibility of production and if found to be feasible, develop a full business plan for expansion of production of amadumbe chips.

Table 17: Notional budget for feasibility and piloting of amadumbe chip production (Duration: 3 years)

Activity – amadumbe chips	Cost			
	Year 1	Year 2	Year 3	Subtotal
To assess previous initiatives to produce amadumbe chips (e.g. CSIR and KZNDEDTEA) and to learn lessons from these initiatives regarding the major challenges and how they can be overcome.	80000			80,000
Conduct a market analysis to assess the marketability of amadumbe chips produced, including engagement with various retailers, manufacturers and distributors to understand the scope of the market. Included in this assessment should be an analysis of consumer preferences regarding amadumbe chips.	60,000	40,000		100,000
Establish production trials using different varieties of amadumbe to determine the production characteristics of the different varieties and their suitability for use in the production of chips.	120,000	120,000	120,000	360,000

Activity – amadumbe chips	Cost			
	Year 1	Year 2	Year 3	Subtotal
Establish a mini production factory in Mbongolwane for the piloting of chip production by the local community. The chips produced at the mini-factory can also be used to test the market's preferences regarding amadumbe chips	300,000	100,000	100,000	500,000
Determine the feasibility of production and if found to be feasible, develop a full business plan for expansion of production of amadumbe chips.		60,000	150,000	210,000
			Grand total	**1,250,000**

8.3 Business plan 3: Craft value chains

There are four craft groups, namely, Ikhowe, Masibambane, and KZN Paper Making craft groups, who all operate under Inina Craft Agency. Thubaleth'elihle is the only craft group located in Mbongolwane. Inina was established to provide marketing support and to assist with the development of new craft products in response to market demand.

From a craft production perspective, constraints to value chain alignment were identified all along the value chain, suggesting that interventions should at the various stages of the value chain. In recent times, the support provided by Inina to producers has declined. A new craft programme, funded through the Jobs Fund has recently been established and is being implemented by Lima Rural Development Foundation and the Siyazisiza trust. The Siyazisiza trust had linkages into large, well-established craft markets. The key drivers, enablers, barriers and regulators are:

- Drivers and enablers
    - Opportunities to supply Siyazisiza Trust craft initiative.
    - Low input costs of raw materials from the wetland.
    - Local craft market in Eshowe.
    - Linkages to Inina Craft Agency.
    - High demand for certain products.
- Barriers and regulators
    - Decline in raw materials (Ikhwane, Imizi, Incema) as a result of (1) drying of wetland, (2) encroachment of sugarcane (3) burning of wetland (4) livestock increasingly grazing in the wetland.
    - Lack of new orders for existing products.
    - Lack of support from Inina Craft Agency.
    - Old age profile of most crafters.
    - Time taken to produce products results in inconsistent supply resulting in limited market access.
    - The need to diversify products.
    - Encroachment of grass species (*Panicum maximum*) limiting the production of fibre-based craft raw materials.
    - Lack of access control – common property is becoming an open access resource.

The sections below detail the support required for craft production, following by a budget and a terms of reference.

8.3.1 Inputs and production

8.3.1.1 Securing fibre-based plants as inputs for craft

There are four main plants that are used for fibre-based craft in the Mbongolwane wetland. These are Incema (*Juncus sp.*), Ikhwane (*Cyperus latifolius*) and Imizi (*Cyperus sexangularis*) and Umhlanga (*Phragmites sp.*). Two species (Incema and Imizi) were identified by crafters as high demand wetland plants that are in short supply. Ikhwane is a plant that is used in high volumes and is considered to be increasingly limited in availability.

To ensure that the supply of these plants remains secure, the location of these plants should be mapped and areas where high intensities of harvesting occur should be protected from livestock, burning and cultivation. Given the high demand and short supply of Incema and Imizi, these should be protected and where possible should be cultivated or re-established in the wetland where they usually occur. There are opportunities for direct sales of raw material and for value addition of these two species.

The encroachment of *Panicum maximum*, an indigenous grass species and a common agricultural weed into the wetland should also be investigated and a management plant to control its spread should also be developed.

8.3.1.2 Securing other inputs for production

Increasingly, crafters need to diversify to meet evolving market demand. This will require securing of inputs that are not locally available, which include beads, wire and other metals, fabric and sewing equipment. Crafters should work collectively to secure the inputs required by forming buying groups and should also strengthen linkages with market outlets, such as Inina Craft Agency and the Siyazisiza Trust.

8.3.2 Value adding, product diversification and marketing

8.3.2.1 Markets

A major challenge for producers in Mbongolwane is a lack of marketing of craft products within Mbongolwane and outside. A prerequisite for diversification of products and continued access to markets requires effective associations with organisations that are 'plugged in' to the markets and can provide support and training for new product development. Currently there are two organisations that can provide this support, namely Inina Craft Agency and the Siyazisiza Trust.

The Siyazisiza trust has a well-established marketing relationship with Tigers Eye, a retailer of craft products. Recently, the Siyazisiza Trust has secured funding in partnership with Lima Rural Development Foundation to link with crafters and develop new products for the Tigers Eye market. The Siyazisiza Trust, whose main objective is to promote small enterprise development in the food and craft production sectors can be a big game player in this. The Trust's focus on providing support with regards to market access for both food and craft products is well suited for Mbongolwane. Because the Trust's model of operation is establishing secondary co-operatives for managing the marketing, administration and financial management on behalf of producers, working with the Trust will help producers in Mbongolwane in solving problems such as transport access. Furthermore, because the Trust offers training in areas such as in financial literacy, record keeping, banking, savings, quality control, pricing, etc., working with the Trust has the potential to be advantageous to producers in Mbongolwane.

Inina has been providing support to Mbongolwane crafters for the last ten years, but is currently unable to provide the necessary support. Firstly, Inina is not tax compliant (there is an outstanding payment due to the South African Revenue Services for a large order sold in Canada). This has resulted in Inina being unable to explore and negotiate with existing and new markets. Secondly, the

Siyazisiza Trust who initially engaged with the Mbongolwane crafters through Inina has now circumvented Inina and is engaging directly with the crafters at Mbongolwane (see Figure 12). Inina requires support to renegotiate its business relationship with Siyazisiza. This will allow the producers to supply to both Siyazisiza and to Inina's market outlets (assuming that the tax compliance issues are resolved).

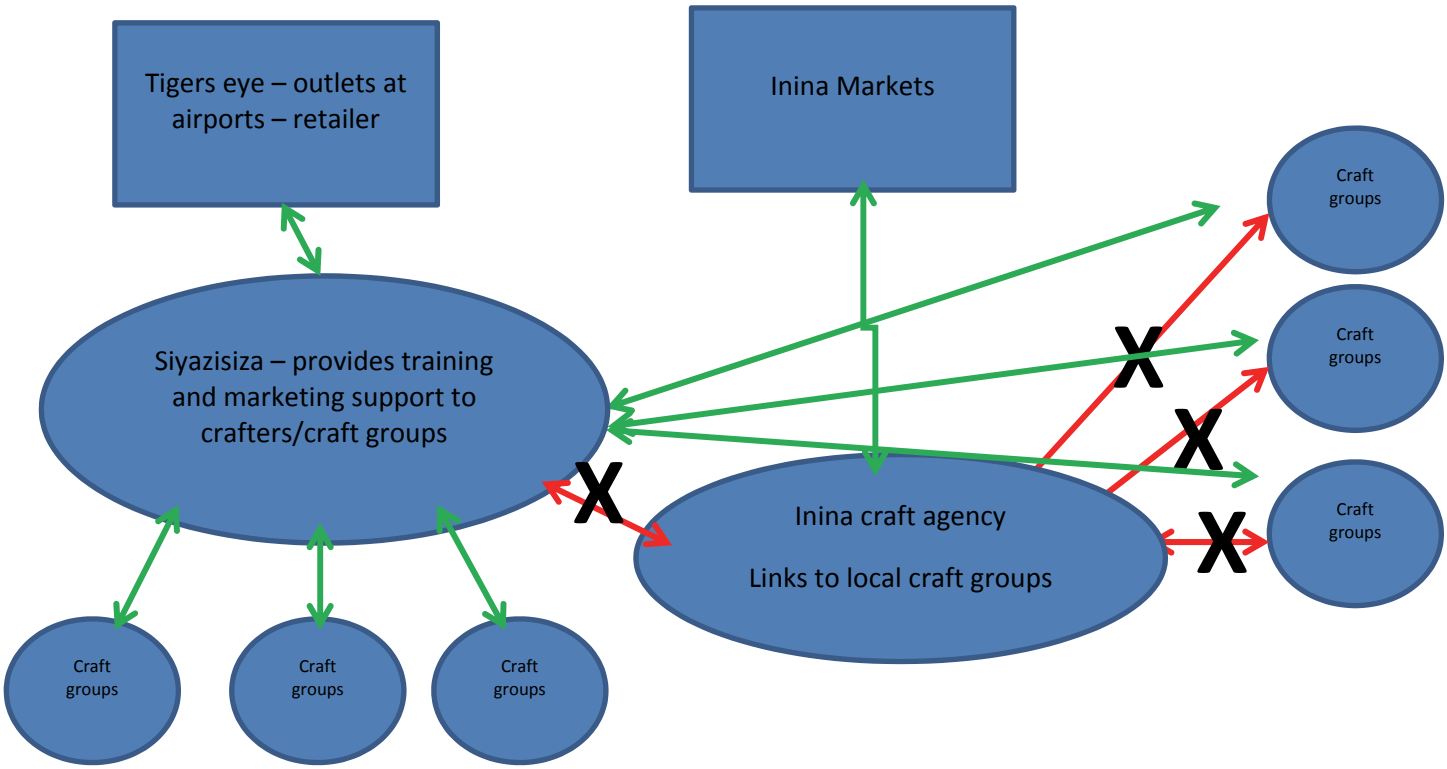

Figure 12: Schematic of previous and current business relationship between Siyazisiza Trust and Inina Craft Agency (Green lines represent current relationship; red lines show the previous business relationship).

In terms of direct markets for craft raw materials, the sale of raw craft materials should be promoted. A central sale point for such raw materials (e.g. the Thubaleth'elihle craft centre) should be established and be advertised to potential buyers. Harvesting of wetland plants by persons not from the area should be controlled and such individuals should be directed to a sale point to purchase the plants they require.

8.3.2.2 Value addition and product development

Another reason for drying out of orders for craft products is the narrow range of products produced by crafters. It was learnt during the course of this study that currently the major craft products produced in Mbongolwane are sleeping mats, doormats, tablemats, conference bags and beadwork. This is a very narrow range of products and these are rarely on demand in the broader market.

The major intervention required in the craft value chain include the following, Train crafters in new set of skills (e.g. sewing) to help with the diversification of craft products so as to attract a diverse range of customers. Ongoing skills development and transfer is necessary for continued product development and new value addition. To achieve this, partnerships with markets (e.g. through Inina

and Siyazisiza) should be strengthened and backward/forwards communication regarding new concepts and products should be established.

Skills development and transfer should focus on:

- Adapting to new craft products.
- Regular training and updating to allow adaptation as demand changes regularly.
- Skills development to bring in new, younger crafters – there is a need to increase the number of producers to meet orders, which often have a short turnaround time. Training and co-opting new, younger crafters will:
    - Increase the number of producers to respond to orders.
    - Allow faster adaption to new products (young people adapt more readily).
    - Facilitate better communication (young people have higher levels of education and can communicate with a variety of electronic media).
- Providing business and personal finance training to crafters so as to be able to sustain themselves when orders are not coming by and designating areas within the wetland for ikhwane (or any other craft material) protection.

8.3.3 Possible partners and funders

- Siyazisiza Trust, who provide market access and training for craft producers.
- Department of Water and Sanitation.
- International Water Management Institute – this organisation supports interventions that generate benefits from the sustainable use of aquatic systems.

8.3.4 Target groups

Support should focus on the existing craft groups operating within the Mbongolwane wetland area as well as Inina Craft Agency.

8.3.5 Draft terms of reference for interventions

The production of craft has great potential to generate income for local communities around Mbongolwane and has done so in the past. Currently, linkages to outside markets are limited and need to be strengthened. Organisational support to crafters is necessary to secure access to markets by strengthening external linkages to marketing agencies, in particular the Inina Craft Agency based in Eshowe and the Siyazisiza trust. In addition, supply agreements for craft products should be secured and crafters need to be supported to respond effectively to the market. Furthermore, communication and information sharing regarding orders and new product development needs to be strengthened through improved governance arrangements.

For crafters to be able to respond to market demand, diversification of craft products needs to be achieved. This may include craft making use of non-wetland plants (e.g. fabric, beads, wire.). Crafters require support to diversify their product ranges to sustain their marketing efforts and build more sustainable enterprises.

The Mbongolwane wetland is an important source of raw materials for fibre-based craft products, however there are indications that there is a decrease in the availability of certain craft plants, particularly Imizi (*Cyperus sexangularis*) and Incema (*Juncus sp*). This is thought to be due to increasing livestock pressure in the wetland, changes in land use surrounding the wetland and water abstractions and encroachment of non-wetland grass species (e.g. *Panicum maximum*). The availability of these raw materials requires further investigation and management plans to ensure the supply of these and other wetland plants used for craft need to be developed and implemented.

8.3.5.1 Main activities required

- Organisational and operational support to crafters in Mbongolwane to better access new markets, increase quantities of production, bring new crafters into production and secure inputs for craft production that is not locally available (e.g. beads, wire and other metals, fabric and sewing equipment).
- Map the availability of important wetland plants used for craft and identify threats to these plants. Develop a management plan for ensuring the availability of craft raw materials. This may include the cultivation of certain high demand wetland plant species.
- Establish improved linkages to outside markets through product development, and better association with market outlets, for example Inina Craft Agency and Siyazisiza Trust.
- The Inina Craft Agency is an important local organisation for assisting crafters to access markets. Inina Craft Agency should be provided with operational support to engage more effectively with markets.
- The development of new craft products through training and mentorship to build sustainability and income generation for craft producers in Mbongolwane.

Duration: 5 years.

Table 18: Notional budget for craft support

Activity – craft support	Cost					
	Year 1	Year 2	Year 3	Year 4	Year 5	**Subtotal**
Organisational and operational support to crafters in Mbongolwane to better access new markets, increase quantities of production, bring new crafters into production and secure inputs for craft production that is not locally available (e.g. beads, wire and other metals, fabric and sewing equipment).	100,000	200,000	200,000	50,000	50,000	**600,000**
Map the availability of important wetland plants used for craft and identify threats to these plants. Develop a management plan for ensuring the availability of craft raw materials. This may include the cultivation of certain high demand wetland plant species.	200,000	100,000				**300,000**
Establish improved linkages to outside markets through product development, and better association with market outlets, for example Inina Craft Agency and Siyazisiza Trust.	50,000	120,000	120,000	120,000		**410,000**
Provide Inina with operational support to engage more effectively with markets.	60,000	60,000	60,000	60,000	60,000	**300,000**
Develop new craft products through training and mentorship to build sustainability and income generation.	80,000	100,000	80,000	80,000	80,000	**420,000**
					Grand total	**1,610,000**

8.4 Business plan 4: Continued provision of ecosystem services

Despite a decline in wetland use due to a movement towards a cash economy, the Mbongolwane wetland still plays an important part in people's livelihoods. There is a need to identify ways in which the services provided by the wetland can improve income generation and enterprise development, while minimising negative impacts.

8.4.1 Water Issues

Water is necessary for the ecological functioning of the wetland and drives the expression of vegetation within the wetland. Furthermore, the availability of water in the wetland is important for agricultural production, the growth of craft raw materials, watering of livestock and for spiritual and cultural reasons. Finally, the supply of good quality water to downstream users (e.g. the Amatigulu mill and the Amatigulu Estuary) is important.

Interviews with stakeholders revealed a dominant perception that the wetland is drying out. This could be caused by the following factors:

- Water abstractions

Water abstractions from the wetland represent a cost saving for Municipal service provision as the cost of storing and reticulating water from other sources is reduced. The Mbongolwane hospital also abstracts water from the wetland. The volume of water being abstracted needs to be considered in terms of the full costs of abstraction and its impact on the wetland and wetland users (local and downstream).

- Impact of sugarcane expansion on the wetland

Many respondents indicated an expansion in sugarcane production in the areas surrounding the wetland. Respondents reported that some sugarcane farmers are burning the wetland with a view to expanding their sugarcane production. This requires that the extent of sugarcane production in the wetland needs to be investigated as well as the degree to which sugarcane has expanded in recent times and the impact this has had on water yield in the upper catchment.

- Change in wetland structure and function

Pressure by livestock on the wetland, attributed by local respondents to an expansion of sugarcane adjacent to the wetland, is increasing, which could have impacts on wetland condition. In addition, regular burning may also be a contributing factor.

The perception of the wetland drying out requires further investigation to understand what specific factors may be contributing to this.

8.4.2 Map the ecosystem services of the catchment

This research project has qualitatively described the ecosystems services provided by the wetland to local communities and downstream users. However, the ecosystem benefits provided locally and to downstream users need to be better understood, particularly the regulating and supporting services that are provided to downstream users. Important examples of the downstream users are the commercial cane growers, the sugar mill and the Amatigulu estuary. Water is a particularly important service utilised by downstream users and needs to be quantified. A water budget for the catchment should be developed and abstractions of water from the wetland need to be quantified (who is drawing the water, for what purpose and what volumes). Furthermore, water flows under different land use scenarios (e.g. cane expansion) should be investigated. In addition, the role Mbongolwane plays in maintaining river and estuary health should be evaluated and quantified.

The mapping exercise can quantify the services provided by the wetland and this can be a basis for motivating for the establishment of measures to incentivise local communities to manage the wetland more sustainably and also to determine what incentives (economic or otherwise) downstream users can provide for better management of the wetland.

An in-depth analysis of all stakeholders using water within the catchment, from the source down to the estuary needs to be conducted to inform the mapping exercise. This will provide a thorough understanding of the roles and needs of different stakeholders, especially as they relate to the wetland and water use within the catchment. The stakeholder analysis will inform the mapping by:

- Identifying different sectors occurring in the catchment (e.g. commercial cane, small-scale cane, commercial agriculture, conservation) their land use and water requirements.
- Quantifying the use of water or the need for water resources for their livelihood/management objectives.
- Ranking the importance of different ecosystem services to different stakeholders.

From the perspective of the Mbongolwane wetland, it is necessary to understand local use of the wetland. Thus a survey should be conducted with a representative sample of local Mbongolwane households to understand their socio-economic status, levels of employment and education, livelihood strategies, energy usage and sources, income and expenditure. This assessment should quantify the benefits (income generated from leasing the land and employment opportunities created) that households are obtaining from the Simamisa sugar programme.

Furthermore, the analysis should consider changes in land-use over the period 1985 to 2015, to quantify land use changes within and adjacent to the wetland over this period, particularly in relation to the presence or absence of sugarcane.

8.4.3 Develop a wetland management plan

A wetland assessment, considering condition and functionality, is necessary to guide the development of a wetland management plan. Anthropogenic (e.g. fire, abstractions, grazing) impacts on the wetland need to be considered as well as the role of climate on the functioning of the wetland (i.e. is drought or activity around the wetland causing it to dry out). In addition, sustainable harvesting rates for high demand wetland plant species should be established, enforced and monitored.

The transitional zone of the Mbongolwane wetland is comprised of grassland and the boundaries of the wetland have not been properly mapped. The absence of clearly defined boundaries of the Mbongolwane wetland system means that there is a risk of encroachment of agricultural activities into the wetland. It is therefore necessary to define the wetland boundary to ensure that large-scale agricultural activities (including sugar production) do not encroach on the wetland.

The management plan should also include specifications for wetland agriculture. Seriously degraded areas should be targeted for rehabilitation.

8.4.4 Draft terms of reference for interventions

The ecosystem services of the Mbongolwane wetland are important for both local and downstream users. Locally, the wetland is a source of natural resources for craft, building materials, grazing, medicinal plants and agriculture. Downstream, water is an important service for irrigation, potable water, industry and the Amatigulu Estuary, an important freshwater estuary in KwaZulu-Natal. There is a need to better understand the ecosystem services provided by the Mbongolwane wetland. The following areas of research are required to better sustain the ecosystem services of the Mbongolwane wetland.

8.4.4.1 Evaluate the ecosystem services in the Mbongolwane wetland

There is a perception on the part of local users that the wetland is drying out. While the current drought may be influencing these perceptions, it is necessary understand what factors may be impacting on the hydrology of the wetland. Two possible factors influencing the hydrology are (1) abstractions of water from the wetland and adjacent areas for potable water and (2) changes in landuse surrounding the wetland, notably, the expansion of sugarcane. Research is needed to:

- Quantify the volumes of water being abstracted from the wetland and the potential impacts this has on wetland hydrology as well as the impact this may have on downstream users.
- Map the changes in landuse in the catchment of the wetland and to determine what impact, if any, this has had on wetland hydrology. An assessment of current land use, land use changes between 1985 and 2015 and the implications for this on catchment hydrology should be conducted.
- Compile a water budget for the entire catchment, quantifying flows and abstractions of water.
- Identify other factors that may influence the hydrology of the wetland.

From an ecosystem services perspective, there are various users of ecosystem services within the Amatigulu catchment, which has its headwaters in the Mbongolwane wetland. To better understand the flow of benefits in the catchment, particularly in relation to water, it is necessary to map water as an ecosystem service and factors that influence the flow of services. Specifically, the following research is required:

- An analysis of stakeholders using water within the catchment, including identifying different sectors occurring in the catchment (e.g. commercial cane, small-scale cane, commercial agriculture, conservation) and their land use and water requirements. This should include a survey of a representative sample of households around the Mbongolwane wetland to understand socio-economic conditions, livelihood strategies, energy use and benefits households are deriving from the wetland and adjacent areas (e.g. cropping, craft).
- Quantifying the use of water or the need for water resources for their livelihood/management objectives.
- Ranking the importance of different ecosystem services to different stakeholders.

8.4.4.2 Develop a wetland management plan

A management plan for the Mbongolwane wetland is required to ensure the sustainable use of wetland resources. This should include:

- A wetland assessment considering condition and functionality of the Mbongolwane wetland, including anthropogenic impacts, the role of climate change and threats to the wetland.
- Delineation of the wetland boundary. The absence of clearly defined boundaries to Mbongolwane wetland means that there is a risk of encroachment of large-scale mechanised agricultural activities into the wetland.
- A wetland management plan, including limitations in terms of wetland use (agriculture, resource harvesting) and threats that must be addressed (e.g. degradation, invasive alien species).

Project duration: 2 years

Table 19: Notional budget for ecosystem services assessment and wetland management

	Year 1	Year 2	**Subtotal**
Evaluate the ecosystem services provided by the Mbongolwane wetland			
Hydrology in the catchment			
Quantify the volumes of water being abstracted from the wetland and the potential impacts this has on wetland hydrology as well as the impact this may have on downstream users.	80,000.00		**80,000.00**
Map the changes in landuse in the catchment of the wetland and to determine what impact, if any, this has had on wetland hydrology. An assessment of current land use, land use changes between 1985 and 2015 and the implications for this on catchment hydrology should be conducted.	60,000.00	30,000.00	**90,000.00**
Compile a water budget for the entire catchment, quantifying flows and abstractions of water.		80,000.00	**80,000.00**
Identify other factors that may influence the hydrology of the wetland.		40,000.00	**40,000.00**
Map water as an ecosystem service and factors that influence the flow of services.			**-**
Conduct an analysis of stakeholders using water within the catchment, including identifying different sectors occurring in the catchment (e.g. commercial cane, small-scale cane, commercial agriculture, conservation) and their land use and water requirements. This should include a survey of a representative sample of households around the Mbongolwane wetland to understand socio-economic conditions, livelihood strategies, energy use and benefits households are deriving from the wetland and adjacent areas (e.g. cropping, craft).		120,000.00	**120,000.00**
Quantifying the use of water or the need for water resources for their livelihood/management objectives.	30,000.00	50,000.00	**80,000.00**
Ranking the importance of different ecosystem services to different stakeholders.		30,000.00	**30,000.00**
Develop a wetland management plan			**-**
Conduct a wetland assessment considering condition and functionality of the Mbongolwane wetland, including anthropogenic impacts, the role of climate change and threats to the wetland.	150,000.00		**150,000.00**
Delineate of the wetland boundary to reduce the risk of encroachment of large-scale mechanised agricultural activities into the wetland.	40,000.00	40,000.00	**80,000.00**
Compile a wetland management plan, including limitations in terms of wetland use (agriculture, resource harvesting) and threats that must be addressed (e.g. degradation, invasive alien species).	30,000.00	80,000.00	**110,000.00**
		Grand Total	**860,000.00**

8.5 Business plan 6: Implementation of institutional and governance arrangements

In the past, there were well established governance systems regarding access to and use of the Mbongolwane wetland which was controlled by the Traditional Authority. There are indications that the institutions governing wetland access and use are declining. Users from outside the area (as far away as Nongoma) are reported to be harvesting from the wetland. Conflicts between crop farmers and livestock farmers (who are forced to graze their livestock in the wetland due to changes in terrestrial land use) are also increasing. A proposed governance arrangement (summarised in Figure 13) has been developed through stakeholder consultation and should be piloted.

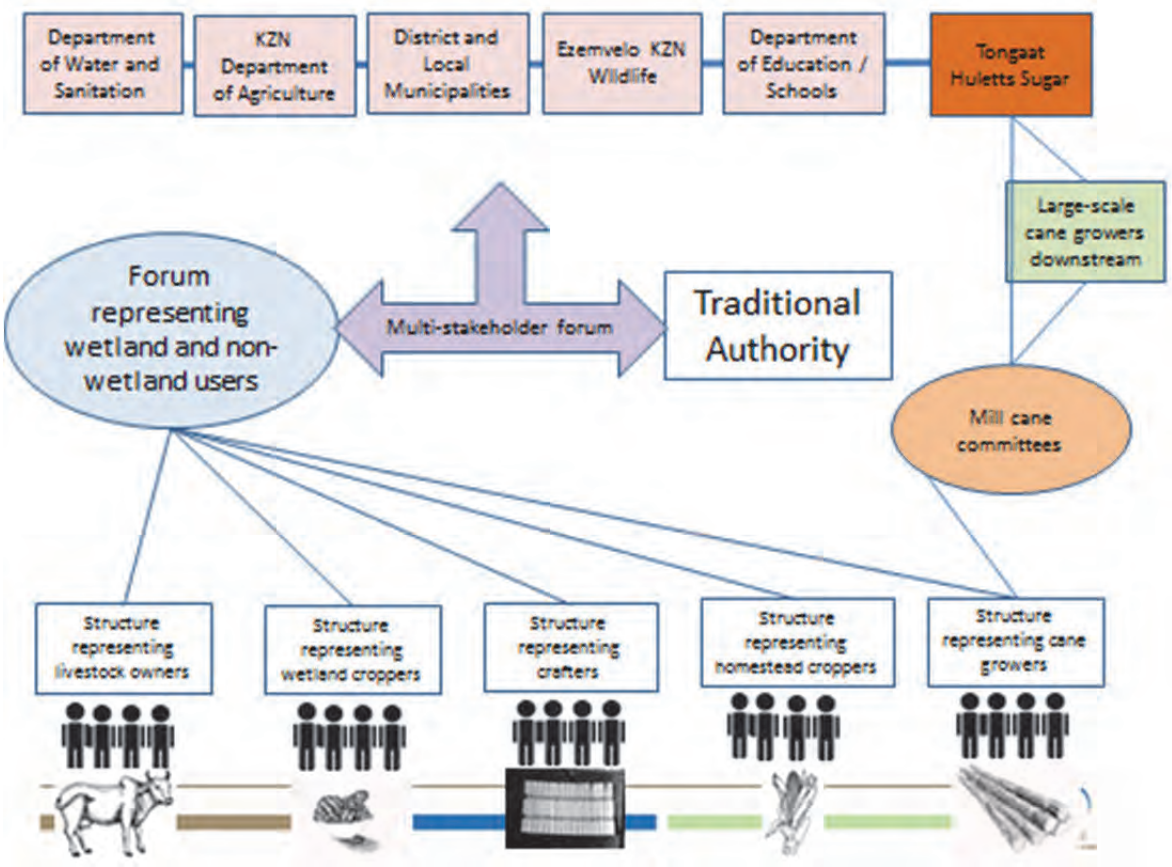

Figure 13: Overview of proposed governance arrangements for Mbongolwane wetland

Governance of ecological resources, such as wetlands, requires multi-stakeholder platforms to allow the interests and objectives of different stakeholders to be properly voiced and considered in planning. The implementation of governance arrangements to strengthen wetland access use and management will focus on establishing the platforms for stakeholder engagement, particularly from a local community perspective. An adaptive management approach should be adopted allow the most suitable management arrangements to evolve.

From an institutional perspective, the development will focus on resource allocation processes, opportunities for sharing benefits from communal resources that generate financial gains. In addition to local stakeholders, broader stakeholder groups such as the Local Municipality, Simamisa, Tongaat Hulett Sugar, Department of Water Services, Ezemvelo KZN Wildlife and KZN Department of Agriculture and Rural Development will be invited to participate in these meetings, when their input is required. The important stakeholders in terms of their roles are summarised in Table 20.

Table 20: Overview of stakeholders and their potential roles in the management or use of Mbongolwane wetland

Stakeholder	
Private	Tongaat Hulett Sugar
	Simamisa (Service Provider)
Government	Department of Environmental Affairs (Including Ezemvelo KZN Wildlife)
	District and Local Municipality
	KZN Department of Agriculture and Rural Development
	Department of Water and Sanitation
Community	Traditional Authority
	Forum
	User group structures (livestock, cropping, sugarcane, craft)

The piloting of institutional and governance arrangements around the wetland should also guide recommendations for incentives of improved ecosystem services from the wetland.

Ultimately, the governance structures should be capacitated to develop action plans to take initiatives forward in the medium- to long term (5-10 years). Such plans should be developed with support from state agencies, NGOs and markets.

8.5.1 Draft terms of reference for interventions

Governance of ecological resources, such as wetlands, requires multi-stakeholder platforms to allow the interests and objectives of different stakeholders to be properly voiced and considered in planning. The Mbongolwane wetland is used by a range of different actors, primarily for agriculture and harvesting of natural resources for craft, building materials and medicinal plants. In addition to this, there are government departments who are responsible for the management of the wetland (e.g. Department of Environmental Affairs and Department of Water and Sanitation. Furthermore, there are actors adjacent to the wetland who can potentially impact on how the wetland is used (e.g. sugarcane production). Finally, there are downstream users who benefit from the ecosystem services provided by the wetland (e.g. the Amatigulu Mill, irrigators and the Amatigulu Estuary). To ensure that the needs of the various stakeholders are accommodated and to ensure that the wetland is managed to sustain the ecosystem services it provides, a proposed governance structure to represent the interests of various stakeholders has been developed. This structure has been presented to local stakeholders through multistakeholder workshops and has been provisionally approved. The governance structure now requires piloting and implementation. The following activities are required:

- Engage with the various stakeholders involved in the wetland to collectively establish and formalise the governance arrangements.
- Develop a leadership structure to implement a mutually agreed, collective wetland management plan.
- Provide training and support for stakeholders to participate effectively in meetings.
- Develop and implement a set of rules relating to use and access to the wetland.
- Facilitate quarterly meetings for a period of two years.

Project Duration: 3 Years

Table 21: Notional budget for supporting wetland governance structure

Activity – implement and support wetland governance structure	Cost			
	Year 1	Year 2	Year 3	**Subtotal**
Engage with the various stakeholders involved in the wetland to collectively establish and formalise the governance arrangements.	120000			**120,000**
Develop a leadership structure to implement a mutually agreed, collective wetland management plan.	80000			**80,000**
Provide training and support for stakeholders to participate effectively in meetings.	60000	30000		**90,000**
Develop and implement a set of rules relating to use and access to the wetland.	30000	60000		**90,000**
Facilitate quarterly meetings for a period of two years.		120000	120000	**240,000**
			Grand Total	**620,000**

8.6 Discussion

The business plans provided in this document provide a foundation for supporting and developing local value chains to contribute to local livelihoods, income generation and supporting the maintenance of services provided by the wetland through better management of the wetland. The focus over the next five years should be on implementing the proposed activities.

Looking to the longer term, and building on lessons learned from implementing this business plan, the focus should be on advancing the alignment of local value chains to generate better value for users of the Mbongolwane wetland, with a focus on more value addition of agriculture and craft products, once primary production has been ramped up dramatically.

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APPENDIX 1: WETLAND ECOSYSTEM SERVICE USE, DEPENDENCY, VALUATION AND INSTITUTIONAL ORGANISATION OF WETLAND MANAGEMENT IN VARIOUS PARTS OF THE GLOBE.

DEPENDENCY OF PEOPLE ON ECOSYSTEM SERVICES.

Ecosystem services	Mbongolwane wetland	South Africa	International
Provisioning			
• Agriculture	Cultivating is one of the predominant uses of the wetland. Cultivation takes place mostly in the form of community gardens (Thuthukani and Hlanganani, which cover about 3.7 ha) and individual plots (covering 5.2-7.2 ha). The three main crops produced are amadumbe, cabbage and onion (produced by 82%, 31% and 23% of households, respectively). Of all the crops produced, an average of 80% is used for household purposes while the rest is sold. According to the 2002 estimates, about 30 metric tonnes of amadumbe are produced per ha annually. Although 45% of the wetland is left aside for livestock grazing, livestock numbers are very low in the area. Therefore livestock farming contributes very little to the local economy (Kotze et al., 2002).	At Ga-Mampa wetland, crop production is the main activity taking place in the wetland. The main crops produced in this wetland are maize (2.04 tonnes/ha), groundnut (1704 kg/annum for the whole wetland), coriander (1.5 tonnes/ha), beans (0.37 tonnes/ha), beetroot (533 units/ha), sugarcane (1875 sticks/ha) and banana (375 bundles/ha; 1 bundle is equal to 15 pieces of banana). According to a survey conducted in the 2005/2006 season, 84 donkeys, 618 cattle and 1115 goats graze the wetland (Adekola 2007). At Mfuleni, 7.2% of the population cultivates the wetland and the most commonly cultivated crop is spinach. However, cultivation occurs at a small scale (next to people's houses) with an average plot size of only 0.002 ha. 8.6% own livestock and use the wetland to feed livestock (Lannas and Turpie, 2009).	In Kilombero Valley wetlands, Tanzania, crops produced include maize, rice, sorghum, beans, groundnuts, cocoa, cassava, sweet potatoes and bananas. Rice production in many East African countries is the most cultivated crop as it serves as the staple food in the region. Therefore most of the crops produced are for household consumption (Kangalawe and Liwenga 2005).
• Craft/thatching	Plants species most commonly harvested for crafts are ikhwane (*Cyperus latifolius*) and umhlanga (*Phragmites* spp.). About 5-20 tonnes of ikhwane are harvested per	At Ga-Mampa, 2512 bundles (60 cm in diameter, 5-10 kg) of reed (*Phragmites* spp.) are harvested annually. With regards to sedge (*Cyperus* spp.), 756	*Cyperus* is the most commonly collected wetland resources in the Kilombero Valley and serve diverse roles in handcraft and fish-trap making (Kangalawe and Liwenga,

Ecosystem services	Mbongolwane wetland	South Africa	International
	year whereas 3 ha of umhlanga is harvested per year. Other notable plants harvested include ingongoni (*Aristida junciformis*; for making brooms) and umvithi (*Eragrostis plana*; for making floor mats) (Kotze et al., 2002).	bundles are harvested. Similarly, *Phragmites* is the most harvested plant at Mfuleni wetland (Lannas and Turpie, 2009).	2005). In the Okavango Delta, Botswana, river reed (*Phragmites* spp.) collection is the primary activity in the catchment. In total, 228 bundles (80 mm in diameter and 10 kg in weight) of river reed are harvested annually per household. These are either sold to craft makers or are used for various household purposes especially thatching (Mmopelwa, 2006).
• Medicines	Medicinal plants harvested in the wetland are uxhaphozi (*Ranunculus multifidus*) and uklenya (*Gunnera perpensa*) (Kotze et al., 2002).	At Ga-Mampa, the three types of medicinal plants collected from the wetland are (in Pedi: *Mupurogu*, *Mutusa*, *Masheo Mabe;* botanical names could not be identified) (Adekola, 2007).	
• Water	About 24% and 50% of households use water from the wetland for drinking/cooking and washing/bathing, respectively (Kotze et al., 2002).	A total of 6 329 061 litres of water are collected from the Ga-Mampa wetland annually (Adekola, 2007).	
Regulating/supporting	The wetland provides regulating and supporting services which include stream flow regulation, nutrient cycling and flood attenuation. The wetland also provide an important environment for cultivation of valuable food crops because of their rich soils and year-round soil moisture, which allows for the cultivation of crops during the dry and wet seasons as well as in dry years. Therefore regulating/supporting services extend beyond providing a	Ga-Mampa and Mfuleni wetlands provide supporting and regulating services. Mfuleni wetland serves an especially important function of purifying water for downstream communities due to its positioning as it receives urban runoff (Lannas and Turpie, 2009). Because of its size, it is not straight forward to establish how much Ga-Mampa wetland contributes in the regulation of ecosystem processes. It has been inferred	Wetlands provide important regulating and supporting services. For example, wetlands in Africa and Asia improve water quality through sedimentation filtration, physical and chemical mobilization, microbial interactions and uptake by vegetation. Thus wetlands are very important in the treatment of polluted water, especially that coming from dispersed sources, as is common in agricultural landscapes (McCartney et al., 2010). Other functions

Ecosystem services	Mbongolwane wetland	South Africa	International
	functioning ecosystem but also underpin the supply of provisioning services to local people and downstream communities (Kotze et al., 2002).	that the Ga-Mampa wetland is important for regulating the quantity of water in the Olifants River. It is also believed that the wetland contributes to the regulation of the micro-climatic condition in the valley; however, because of its large size, potential for this service is regarded as low (Adekola, 2007). Because Ga-Mampa wetland is located in a valley, it serves as a floodplain important for sediment retention: it serves as a deposit for alluvium moved from higher altitude through agents of denudation (Adekola, 2007).	linked to wetlands include water storage, filtration, flood control, toxic retention and providing habitat/refuge for wildlife (Mwakaje, 2009).
Cultural/recreational	The Mbongolwane wetland is used for a variety of cultural practices. Firstly, local widows who bathe in the wetland during the cleansing process following the death of a husband. Secondly, members of the community wash their hands in the wetland after a funeral as part of the cleansing process. Thirdly, the wetland serves as the place where members of the community pay homage to the *iNkanyamba*, the many-headed serpent who is the ancestral guardian of their wetland. Failure to respect the wetland	In the Mafefe area, Ga-Mampa has been designated as a tourist zone by the municipal authority. This is because of the presence of the sacred places believed to be within the wetland. Potentially, there are two of such. These are the invisible tree and invincible river; both are believed to be within the wetland and could not be seen with the ordinary eyes except when accompanied by the village head. The people of Ga-Mampa hold these sacred places very important to them and their culture. It is	The cultural services provided by in other parts of Africa and Asia are limited. Nonetheless, it is acknowledged that knowledge about wetlands and the environment as a whole informs traditional practices and customs. A prominent example is folklore/storytelling whereas some characters (e.g. frogs) are wetland species. The recreational services provided by some wetlands are important to local communities surrounding them. The Okavango Delta is a prime example of this as it attracts a number of local and

Ecosystem services	Mbongolwane wetland	South Africa	International
	and the serpent is said to result in a disastrous storm. The wetland is also used for recreational purposes such as swimming, especially by young boys. However, the use of the wetland for these services appears to be in decline owing to a seemingly apparent intergenerational shift in cultural values and practices as they youth appears less interested in traditional practises associated with the wetland (Kotze et al., 2002; Lewis et al., 2011).	reported that some tourists do visit these sites on regular basis (Adekola, 2007). Because Mfuleni wetland is located in a semi-urban setting, it is unlikely to have any cultural services due to the different cultural attitudes between rural and non-rural communities.	international tourists bringing in over P 1 billion of income annually (Turpie et al., 2006)

ECOSYSTEM SERVICES AND VALUE

Ecosystem services	Mbongolwane wetland Value [1]	South Africa[2]	International
Provisioning	The provisioning services derived from the wetland have high monetary value to the local communities. Because products collected from the wetland can be sold at local markets, the wetland contributes substantially to cash-flow. The biggest monetary value people get is through the cultivation of the wetland. For example, $4400 of profit (total profit for the whole wetland) is made from the amadumbe produced from the wetland per year. The price of 1 kg of madumbe was $0.17 (R2) in 2002 and the current price is at $1.73 (R20) per kg. Crafts produced from the wetland also contribute substantially as they generate a total income of $3537 per annum. This shows how much the cash economy of the local people is dependent on wetland products (Kotze et al., 2002).	It is estimated that $1765/ha is derived annually from wetland provisioning services at Mfuleni. The estimated total value added during 2007 from grazing was $540 286 (Lannas and Turpie, 2009). For Ga-Mampa, the contribution of the wetland to the livelihoods of local community, estimated at an annual net financial value of $211 per household, far exceeds its annual cash income of $35 per household and is about half of the average monthly cash income from all income sources. In Ga-Mampa, crop production contributes the highest gross and net financial value, whereas sedge collection yields the highest cash income (Adekola, 2007).	One factor that underscores the importance of wetland ecosystem services is their economic valuation. Few studies in Africa have focused on economic evaluation of wetland ecosystem services. A global study however estimated the economic value of wetlands in Africa to be $5.25 billion annually (McCartney et al., 2010). In the Hadejia-Nguru wetland in Nigeria, the annual value derived from provisioning services was $34-54/ha (Barbier et al., 1997). In the Nakivubo wetland in Uganda, it was estimated to be $500/ha (Emerton et al., 1999), and in Letseng-la-Letsie in Lesotho, it was $1765/ha (Lannas and Turpie, 2009). In the Zambezi Basin it ranged from $16/ha in the Barotse wetland, $97/ha in the Caprivi wetland and $203/ha in the Lower Shire wetlands (Turpie et al., 1999).
Regulating/supporting	Although regulating and supporting services are important to the local communities, it is not easy to quantify them as they are indirect benefits. As a result, their economic valuation is difficult.	Although wetlands contribute immensely to the regulatory and supporting capacity of the whole ecosystem to which they are part, no	Regulating and supporting services have rarely been valued in literature although people do recognize their importance and how over-utilization of the wetland

Ecosystem services	Mbongolwane wetland Value [1]	South Africa[2]	International
	Surveys conducted in the local communities indeed indicated that the respondents had difficulty in identifying regulating and supporting services, and thus are unable to perceive their value. The inability to attach a value to regulating and supporting services should not be seen as an indication of a lack of their appreciation by the local community. Therefore advising local communities about wetland functioning and how it is influenced by their use of wetlands with help to protect wetlands from unsustainable use (McCartney et al., 2010).	study has valuated the financial value of regulating and supporting services in South Africa. Valuation of wetland ecosystem services is thus required (Adekola, 2007).	(especially over-cultivation) curtails the ability of wetlands to provide other ecosystem services. In fact in eastern Africa, farmers have a deep understanding of the relationship between rainfall, runoff and water table levels. In many ways, this knowledge determines the farmers' management practises of the wetland in that methods of drainage and crop cultivation are developed from experience to suit the hydrological conditions of the wetland (Dixon and Wood, 2003). Therefore regulating and supporting services should be seen as valued the same as other ecosystem services by wetland users.
Cultural/recreational	The cultural and recreational services provided by the wetland are also difficult to quantify as they are indirect benefits. However, these services are important as they cannot be provided by anything other than the wetland. Especially important are the cultural services as these are the essence of being Zulu and also because they are important to all members of the community (Hay et al., 2013).	The cultural services of the Ga-Mampa wetland although have not been valuated economically, but are important for the Pedi Tradition as it serves to preserve their culture, which once lost can never be regained.	The cultural services of wetlands in other parts of Africa and the globe have rarely been highlighted by wetland users and thus can be considered to be of limited financial value.

Ecosystem services	Mbongolwane wetland Value [1]	South Africa[2]	International
Beneficiaries of ecosystem services	The primary beneficiaries of the wetland ecosystem services are local residents, especially women (80%, mostly older) who do most of the work around the wetland. These women either cultivate the wetland in individual plots or in community gardens, of which two (Thuthukani and Hlanganani) are currently active in the area. Thubaleth'elihle Craft Group is the only currently active craft group in the area and makes a lot of income generated by the sale of crafts which are made using plants collected from the wetland. The youth make very limited of the wetland as there seems to be a generational shift from subsistence-based economy to more cash-based economy (Lewis et al., 2011). There however seem to be a shift in beneficiaries because recently, beneficiary groups have become more diverse and more dispersed across the landscape and even countrywide as interest groups have increased. This makes the management of the wetland and the allocation of benefits far more complex: the common pool resource is becoming common to a greater pool of beneficiaries and more people believe that the constitution grants them rights to such benefits. As a result, some local people consider the situation whereby outsiders have access to wetland resources a cause for concern, although not a major issue (Kotze et al., 2002; Hay et al., 2013).	Beneficiaries of the ecosystem services at Ga-Mampa and Mfuleni are members of the local communities especially livestock owners and crop farmers as these activities generate the greatest revenue.	The beneficiaries of ecosystem services in other African countries are members of the local communities, both male and female. Females usually are involved in crop production and plant collection whereas males are involved in livestock keeping and fishing. Thus benefits from wetland ecosystem services are shared equally among males and females.

GOVERNANCE/INSTITUTIONAL FRAMEWORK IN WETLAND MANAGEMENT

Mbongolwane	South Africa	International
The governing institution in Mbongolwane is the local Tribal Authority (KwaNtuli) and its responsibilities include dispute resolution, administration of customary law and allocation of land. Allocation of land takes place at the ward and sub-ward level and involves several structures (including the Tribal Authority, garden committees and the Department of Agriculture). Through these structures, individual user rights are allocated to parcels of land which is allocated to individuals and security of tenure is perceived to be relatively high by the community. Crop farming in the wetland takes place through community gardens which are collective groups of farmers that share the same goal. Allocation of sub-parcels to individuals within a particular community garden is controlled by the group itself and membership is open to all households in the ward but restricted largely to women. The degree of control over allocation of land for cultivation within small individual isolated patches outside of the community gardens varies according to sub-ward. Although in some sub-wards permission is obtained from the headman before cultivating, in most cases no permission is obtained. Consequently, a large proportion of wetland users consider there to be little controlling authority over the use of wetland resources.	The government (the City of Cape Town) is the authority over the use of the Mfuleni wetland as this wetland lies on state land. In Ga-Mampa, the *induna* and his chief *(Kgoshi)* are the traditional and cultural custodians of the Ga-Mampa people. The *induna* is elected and changed only after death. The councillor is the administrative representative of the people of Ga-Mampa valley at the municipality (Lepelle-Nkumpi). The people of Ga-Mampa have also formed for themselves a development forum (Ga-Mampa Community Development Forum- GCDF) responsible to formulate programmes for the development of the area. The forum also liaises with external organizations such as NGOs and research and academic organizations interested in the area. There are about 11 committees under the forum, one of which is the wetland committee.	In most countries (e.g. Tanzania and Botswana), resource extraction from wetlands operates under common property whereby each and every member of the local community has a right to collect/use resources from the wetland (Mmopelwa, 2006; Mombo et al., 2012). In this case, the government holds the wetland “in trust for the people” (communal ownership). In Rwanda, however, farmers are partial owners of the wetlands as all wetlands are under local government authority (Nabahungu and Visser, 2011).