

**Challenges affecting the management of Thulamela wetlands: managers’
engagement with local communities’ use of wetlands**

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ABSTRACT

Wetlands are amongst the world's most important ecosystems providing many direct and indirect benefits to local communities. The majority of South Africans residing in rural areas depends mostly on natural resources for their livelihood. However, wetlands in South Africa continue to be the most threatened ecosystems primarily due to unsustainable use and poor resource management. Additionally, the history of South Africa has been characterised by exclusion of local communities in the process of decision-making and general management of natural resources. The aim of the study was to investigate possible challenges affecting the management of Thulamela wetlands by assessing the level of interaction and conflicting interest amongst participating stakeholders, including role of wetlands on local communities for possibly improved management scenarios. The study used questionnaires, interviews and observations to capture data on the local communities and management stakeholders. Seven wetlands within Thulamela were selected as study areas and the study population was selected based on their specialised expertise, involvement, and closeness to wetlands. Data was analysed using SPSS, Microsoft Excel and also using thematic analysis in NVIVO.

The results show that selected wetlands are highly beneficial in supporting the local communities. Based on the socio-economic and demographic characteristics (family size, age, gender, and employment status) measured, the study deduced that unemployment rate or low income of the respondents is the main contributor to an increase dependency on wetland utilization. Additionally, the results revealed that unregulated use and excessive agricultural practices such as cultivation and livestock grazing are common in all study areas, hence further degradation of these wetlands. One of the findings from the study was the destruction of wetlands through expansion of human settlement. The population increase in the areas was found to be major drivers of socio-economic challenges causing people to spread through and exploit wetlands. Consequently, human settlement

along the wetland area has resulted in the extensive clearance of natural wetland vegetation. Furthermore, the results show that there is poor wetland information transfer to the local communities most likely due to none/or insufficient outreach programmes. The current management arrangements and structures for selected wetlands are not being practiced through the unequal representation amongst management stakeholders and poor inclusion of local communities in management processes. Additionally, there are currently no openly known active platforms provided upon which stakeholders are able to air their views on wetlands management issues. The findings further show differences in perceptions amongst wetlands users, non-users and management stakeholders. The management stakeholders have a relatively strong focus on livelihood and environmental problems, they regard rules and regulations on wetland use' as a relatively central variable. On the other hand, the local communities are currently more concerned about the benefits they receive from the wetlands than the conservation of those systems.

The study also revealed unequal representation amongst participating management stakeholders. The findings show poor interaction between the management stakeholders and the local communities; differences in perceptions amongst resource users, non-users and managers; exploitation of wetlands resources; poor wetlands information transfer. The results suggest that centralised top-down rules and regulations on wetland use are not sufficient for maintaining the wetland ecosystem and this poses a challenge to sustainable wetland management. Therefore, there is a need to develop shared understanding through bottom-up approaches to wetland management that are nested within national regulatory frameworks, ideally combined with awareness building and knowledge sharing on the ecological benefits and management of wetland.

Keywords: *Wetland, ecosystem services, Thulamela, local communities, stakeholders, management*

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DECLARATION

I declare that “*Challenges affecting the management of Thulamela wetlands: managers’ engagement with local communities use of wetlands*” is my own work. All other sources, used or quoted, have been indicated and acknowledged by means of complete references. This work has not been submitted for a degree at another university.

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14 October 2019

Signature:



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ACRONYMS AND ABBREVIATIONS

CARA	Conservation of Agricultural Resources Act
CBNRM	Community Based Natural Resource Management
CMA	Catchment Management Agency
CSRC	Centre for Sustainable and Resilient Communities
DAFF	Department of agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EPA	Environmental Protection Agency
MEA	Millennium Ecosystem Assessment
NEMA	National Environmental Management Act
NGOs	Non-Governmental Organisations
NWA	National Water Act
REC	Research Ethics Committee
SANBI	South Africa National Biodiversity Institute
SSI	Semi-Structured Interview
TLM	Thulamela Local Municipality
VBR	Vhembe Biosphere Reserve
WfWet	Working for Wetlands
WRC	Water Research Commission
WU	Wise Use
WUP	World Urbanisation Prospects
WWF-MWP	World Wildlife Fund-Mondi Wetlands Programme

CHAPTER 1: INTRODUCTION

1.0 Chapter overview

This chapter provides an overview and background of the study: Challenges affecting the management of Thulamela wetlands: participating policy makers' goals vs. local communities' needs and interests. The chapter also explores different approaches in identifying stakeholders involved in the management of the selected wetlands. It then introduces the research questions and lastly it gives an overview of all chapters formulated in the study.

1.1 Background information

Wetlands are amongst the world's most important and productive ecosystems which are internationally recognised as important natural ecosystems (Hu et al., 2017). Depending on the characteristics of each wetland type, they provide an array of important ecological functions and services, ranging from flood control to groundwater recharge and discharge, water quality maintenance, habitat and nursery for diverse plant and animal species, soil components, carbon sequestration and other life support functions (Barbier et al., 1997; Davies and Day, 1998; Birol et al., 2006; Ramsar Convention Secretariat, 2006; Whiteoak and Binney, 2012; Clarkson et al., 2013). Worldwide, wetlands occupy an estimated area of >1280 million hectares which amount to approximately 6.2–7.6% of the Earth's land surface (Melendez-Pastor et al., 2010). Wetlands are globally considered as important but highly complex ecosystems due to the variety of their unique conditions, whether aquatic (flowing or non-flowing water permanently or intermittent) (Ollis et al., 2013) and/or terrestrial/inland (Verones et al., 2013). Despite their importance, many researchers have frequently reported that 50% of the world's wetlands have been lost (Finlayson, 2012; Davidson, 2014; Dalu et al., 2017). Nevertheless, since 1990 this loss rate has extrapolated to a global scale (Davidson, 2014).

In South Africa, wetlands are high-value ecosystems that make up only a small fraction (2.4%) of South Africa's surface area and are known to provide many benefits to the society, such as providing resources for livelihood of communities, habitat for wetland dependent species, purifying water, controlling erosion and other countless services (EPA, 2001; Jogo and Hassan 2010, Skowno et al., 2019; Macfarlane et al., 2016). Wetlands rank amongst the very fragile and most threatened ecosystems in South Africa which are continuously being degraded and poorly managed (Collins, 2005; Skowno et al., 2019). Poor management of wetlands potentially undermines their capacity to provide services in the future. The remaining wetland systems suffer from degradation through increased residential and commercial development, introduction of invasive alien species and aquatic fauna infestations, unsustainable exploitation, artificial drainage and damming, pollution and other factors (Collins, 2005). Other factors considered to contribute in the degradation of wetlands and affect their management include poverty and economic inequality, attitude, pressure from excessive population growth, cultural and social conflicts (Skourtos et al., 2003; Phethi and Gumbo, 2019).

It is estimated that over 50% of South African wetlands has been lost (Skowno et al., 2019; Macfarlane, 2016). Most of the remaining South African wetlands were identified as the most threatened (i.e. 48% critically endangered, 12% endangered, 5% vulnerable) compared to other ecosystems, with only 11% of wetland ecosystem types being well protected, with about 71% not protected (Macfarlane, 2016). Continued degradation of wetlands will greatly impact on biodiversity, ecological function, and the provision of ecosystem services collectively with subsequent impacts on livelihoods and economic activity, as well as the wellbeing and health of affected communities (Xulu, 2014; Herbst, 2015; Macfarlane, 2016). It is, therefore, necessary and crucial to prioritize all of South Africa's remaining wetlands, including those that are least

impacted by current pressures or threats, and offer immediate attention to avoid further loss, conversion or degradation (Skowno et al., 2019; Herbst, 2015). It has been estimated that over 10% of South African land was originally covered by wetlands, although this might differ across studies due to differences in definitions of wetland and delineation methods (Skowno et al., 2019). However, this figure significantly decreases every year due to unsustainable land-use practices. The most common types of wetlands in the Limpopo Province of South Africa are swamps and floodplains (Jogo and Hassan, 2010).

Due to the extreme wetland loss currently being experienced, along with the recognition of their importance in providing a range of environmental functions and services that are socially and economically beneficial to communities, wetlands are becoming increasingly recognised as important natural resources in South Africa (Collins, 2005; Kingsford et al., 2016). The consequences for degradation and loss of wetlands stimulated a concern to value and conserve the ecosystem services and this prompted the attention of different stakeholders (governmental and non-governmental organizations) to take action in restoring and managing the wetlands. However, wetland stakeholders (e.g. policy makers, farmers, land owners, conservationists, land developers, and residents (local communities)) struggle to find ways to work collaboratively to maintain the wetlands ecological functions, while also providing for the needs of multiple human interests (Darradi, 2006; Maze, 2016). Middleton et al. (2011) also stated that, municipalities have difficulties in protecting and maintaining their ecological infrastructure due to numerous socio-economic responsibilities, legal and political obligations.

It is therefore essential to strengthen communication between participating stakeholders for the successful management and restoration of wetlands (Trisurat, 2006). This study aimed to provide a

better understanding of challenges affecting the management of selected Thulamela wetlands amongst the different participating stakeholders (i.e. policy makers' goals, local communities). In addition, this research intended to probe the channel of communication dialogue amongst involved stakeholders concerning challenges and approaches to wetland management for maximum human and environmental ecosystem benefit.

1.2 Problem statement

Many countries in the world are facing water related problems and this situation is increasing every day, primarily because the major water sources such as wetlands ecosystems are not being properly developed, managed and utilised (Srinivasan et al., 2012; Mancosu et al., 2015; Cosgrove et al., 2015; Wondie, 2018). However, the intensity of those problems may vary between countries depending on the roles of various factors such as developmental, demographic and geographical factors (Gourbesville, 2008; Hushulong, 2012; Guppy et al., 2017). Worldwide, over 50% of the wetlands have been destroyed (Mitsch and Gosselink, 2000; Verhoeven and Setter, 2010). The human population increase leads to an increase in demand of products and services from wetland systems. Consequently, population increase inevitably exacerbates the degradation of wetlands through human activities which include excessive developments and other unsustainable utilization (Harte, 2007; Jogo, 2010; Kometa et al., 2018). In developing countries such as South Africa, water crises is rapidly increasing due to poor management and degrading activities on water resources such as wetlands (Herbst, 2015; Rodda, 2016; Belle et al., 2018). South Africa is a semi-arid country with fewer wetlands compared to many other countries (Breen and Begg, 1989; Lindley, 2003; van Deventer et al., 2018), and despite being few in numbers, it has been estimated that over 50% of South Africa's wetlands have been destroyed (Skowno et al., 2019).

To address this issue, several programmes aimed at addressing wetland degradation and loss have been launched. However, it is most crucial that all relevant stakeholders including local communities be given a chance to participate in wetland management plan in order to get a common or shared objective in line with the Integrated Water Resource Management principles (Falkenmark, 2000; Reed et al., 2009; Shrestha, 2013; Aggestam and Sundell-Eklund, 2014). Therefore, all wetlands stakeholders needs to have a healthy communication in order to ensure successful wetlands management plans. By rethinking the sectoral and fragmented approach, it is quite possible to improving the situation through adopting a holistic and integrated approach (Marambanyika and Beckedahl, 2017).

1.3 Research aim and objectives

1.3.1 Research aim

The aim of the study was to investigate possible challenges affecting the management of Thulamela wetlands by assessing the level of interaction and conflicting interest amongst participating stakeholders, including the role of wetlands on local communities for possibly improved management scenarios within Thulamela Municipality in the Limpopo Province, South Africa. The specific objectives and research questions which were formulated to guide the study are highlighted below.

1.3.2 Objectives

1. Identify any stakeholders participating in the management of selected study wetlands
2. Identify wetlands manager's engagement strategies with the local communities; problems and challenges

3. Probe the communities' knowledge and perception on wetlands; wetland use; socio-economic standing; education on wetlands and their general management.

1.3.3 Research questions

1. Who are the stakeholders participating in the management of these Thulamela wetlands?
2. What are the current management arrangements and structures for wetlands in the Thulamela Municipality?
3. Is there equal representation of these stakeholders in wetland management?
4. What are the various views held by different managers with regards to wetland management?
5. What are the local communities' perceptions towards wetlands and their management?
6. What are the common natural resources the local communities derive from the wetlands?
7. What platforms are provided upon which stakeholders are able to air views on management goals?
8. How differences and conflicts are managed amongst stakeholders to facilitate for amicable goal setting consensus?

1.4 Significance and motivation

The motivation of this study comes from acknowledging that wetlands exhibit immense biodiversity and other resources which human beings depend on for their livelihood. Therefore, there is a need to appreciate the interdependence between humans and the environment, to ensure successful natural resources conservation for the future generations. The significance of this study is its contribution to the identification of stakeholders participating in the selected research area and assisting in enhancing a dialog amongst them, and contributes to the sustainable management of wetlands here and other parts of South Africa. The study strived to provide an outline of the

existing management structure, from grass roots to overarching custodian (DWS); typically with details of individuals at different points where possible and this aided in the participation between stakeholders. In addition, the findings of this study contributed in advancing the role of environmental awareness in enhancing stakeholder knowledge with regard to the value of wetlands. The study findings are also useful in challenging stakeholders involved in decision making and capacity building so they become more aware about the urgent need to promote sustainable use and conservation of wetlands.

Various studies (e.g. Goodman, 2003; Lubbe, 2003; Martini et al., 2017) have indicated that resource managers and local community members, as stakeholders, do not perceive natural resource management, participation and experience in the same way. The managers may misjudge what communities are seeking from their participation and most likely do not fully appreciate their efforts. The study, therefore, also highlighted the importance of equitable participation and consensus in strategic goal setting for wetland management.

CHAPTER 2: LITERATURE REVIEW

2.0 Chapter overview

This chapter reviews the existing core literature in relation to wetland ecosystems in different jurisdictions around the world, their significant functions, values, degradation, current status and the management strategies of these ecosystems. The chapter also explores other studies that have been carried out on communities that live on or around wetland areas, and discusses various issues around their use of wetland resources, as well as management issues involving communities. Various challenges that have been discovered to affect the management of wetlands in other parts of the world are also discussed.

2.1 Overview

Wetlands are very dynamic and often complex ecosystems which provide a variety of beneficial services to humans and yet remain ecologically sensitive ecosystems (Turner et al, 2000). Regardless of their sensitivity, wetlands have been and are still being exploited and this has consequently led to degradation and loss of these ecosystems (Skowno et al., 2019; Sievers et al., 2018). Most wetlands are under threat primarily from a variety of human activities (Gren et al., 1994; Dalu et al., 2017). The historical background of wetlands management and conservation is vital to develop a conceptual understanding of how wetland management and restoration has become apparent worldwide. This section aims to review literature on wetlands management mainly focusing on the interaction between participating policy makers/managers and local communities surrounding the wetlands. The literature review mainly focused on reviewing and discussing important subjects in wetlands studies which include: the importance of wetlands, legal implications, stakeholders, programmes for addressing wetlands issues and sustainable wetland

management. The above subject topics are presented primarily because they stress the significant elements that shape wetlands management and conservation.

2.2 Characterization of wetland ecosystems

2.2.1 Defining wetlands

The term wetland refers to a variety of ecosystems which has proved some difficulties in deriving a universally accepted definition for all different types in existence. Complications in defining wetlands are said to arise from the fact that various wetlands evolve over time, where they start as open waters but then get filled with sediments and vegetation to eventually become a dry land (Barbier et al., 1997; Collins, 2005; Amler et al., 2015). The key to identifying a wetland is the presence of water for a significant period of time, this drives change in soil composition, plant and animal communities, microorganisms, and consequently the land begins to function differently from either dry or aquatic habitats (Collins, 2005).

It is worth noting that the definition of wetland mostly differs from country to country. The National Water Act (NWA; 36 of 1998) defines the term wetland as “ a transitional land between aquatic and terrestrial systems where the water table is usually at/ near the surface area or periodically covered with water, and in normal circumstances supports vegetation which is typically adapted to saturated soil”. However, the most common internationally recognised definition for wetlands is given by the Ramsar Convention; “wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, temporary or permanent, with water that is flowing or static, fresh, brackish or salt, including marine areas of which does not exceed six meters at low tide”. The above mentioned definition was adopted by various countries when they signed the Ramsar Convention on Wetlands of International importance which is the international treaty for

the conservation and sustainable use of wetlands. The definition can simply be defined as areas where water is the primary factor controlling the environment, soil composition and the associated plant and animal life.

The above definitions show that the term ‘wetland’ covers a wide range of habitats that have a number of common features where there is seasonal or periodic standing water or saturated soil with the characteristics of fauna and flora (Finlayson and Van der Valk, 1995). In addition to the above definitions, Cowardin et al. (1979) classified wetlands according to their geographic locations which are:

2.2.1.1 Marine systems

These systems comprise of areas which are exposed to the waves and currents of open ocean overlying the continental shelf and its associated coastline. The system’s water regimes are determined by the ebb and flow of oceanic currents (Breen et al., 1997).

2.2.1.2 Estuarine systems

These systems are partially enclosed by land but have open, partially obstructed or intermittent access to the open ocean and are also exposed to a mixture of fresh and salt water bodies. They may include a variety of habitats such as mudflats, lagoons, marshes and mangroves. Because of their major breeding and feeding sites for fish and invertebrates, these systems are well known and regarded as some of the most productive in the world.

2.2.1.3 Riverine systems

These systems are characterised by flowing water. They are composed of small, restricted floodplains and swamps, which occur along river channels. According to Dini et al. (1998), the riverine systems also play a key role in the processes of hydrological regulation.

2.2.1.4 Lacustrine systems

These systems are associated with water bodies such as lakes, pans, or other bodies of fresh water of permanent water with little flow. They are characterised mostly by dammed river channels, lack of trees, shrubs, mosses, and lichens.

2.2.1.5 Palustrine systems

These systems can be described as transition zones between terrestrial and aquatic systems which include freshwater habitats with a wide range of physical water regimes and vegetation characteristics. The characteristics include peatlands and fens, springs, permanent or seasonal marshes and swamps, and headwater wetlands. These systems are said to be the most widespread and are extensively used for crop production, livestock grazing and fisheries. They also include marshes and swamps that are typically dominated by reeds and papyrus, which are important to the livelihoods of many rural communities in Africa. The principal point for the above classification was to establish consistent terms and definitions for use in the wetlands inventory as well as to provide standard measurements for mapping these lands (Cowardin et al., 1979; Matiza, 1994; Bassi et al., 2014).

2.2.2 Wetlands function and value

The perception of wetlands importance has changed over time. Wetlands were once considered as valueless wastelands that should be drained or converted to more valuable land use (Lynch-Stewart, 1983; Pease et al., 1997). However, wetlands are now viewed in an entirely different way. More subtle goods and services become apparent as scientific understanding of wetlands increases. Globally, wetlands vastly differ in their biological, chemical and physical characteristic which consequently determines their biogeochemical cycling, decomposition, transpiration and photosynthesis processes (Turner et al., 2000). All these processes support the structure and the ability of a wetland to be a source of a variety of goods and services (Turner et al., 2000). Wetlands are widely considered as sensitive ecotones providing various goods and services. Mitsch and Gosselink (1993) described wetlands as both the “the kidneys of the landscape” and “biological supermarkets”

- The kidneys of the landscape: because of filter-like functions they are able to perform in the hydrological and chemical cycles.
- Biological supermarkets: because of the extensive food webs they provide and rich biodiversity they support.

Wetlands generally cover a small portion of the world’s surface area but they provide the most significant contribution to the environment (Amler et al., 2015), and the livelihood of people for survival and sustainable development (Scoones, 1991; Schuyt, 2005; Akwetaireho and Getzner, 2010; Wood and Thawe, 2013). Wetland ecosystems can be highly productive by providing several direct and indirect benefits to people and the natural environment. The direct benefits (Haines-Young and Potschin, 2013).provided by wetlands includes water, food, resources, cultural significance, education and research, tourism and recreation (Collins, 2005), and some of the

indirect benefits are water purification, flood control, species support, groundwater recharge or discharge and nutrient retention (MEA, 2005; Collins, 2005; Heather and Barley, 2006; He et al., 2015). In a wetland, there is more life per hectare compared to almost any other habitat (Mitsch and Gosselink, 2000). The link between natural ecosystems and human livelihoods is said to be stronger in poor rural communities, who directly depend on the availability of products and services such as water, food, medicinal plants, firewood and livestock grazing from the wetlands areas (Scholes and Biggs, 2004). The services provided by wetlands can also be summarised and classified into: provisioning; regulating; cultural; and supporting services (Turner et al., 2000; De Groot et al., 2002; MEA, 2005; Hein et al., 2006) (Figure 2.1).

- Provisioning services: all tangible products that are directly obtained from ecosystems.
- Regulating services: non-tangible benefits attained from the regulation of ecosystem processes.
- Cultural services: non-material benefits obtained from ecosystems with the intention to satisfy cultural interests or needs.
- Supporting services: services that allow for the other ecosystem services to be present.

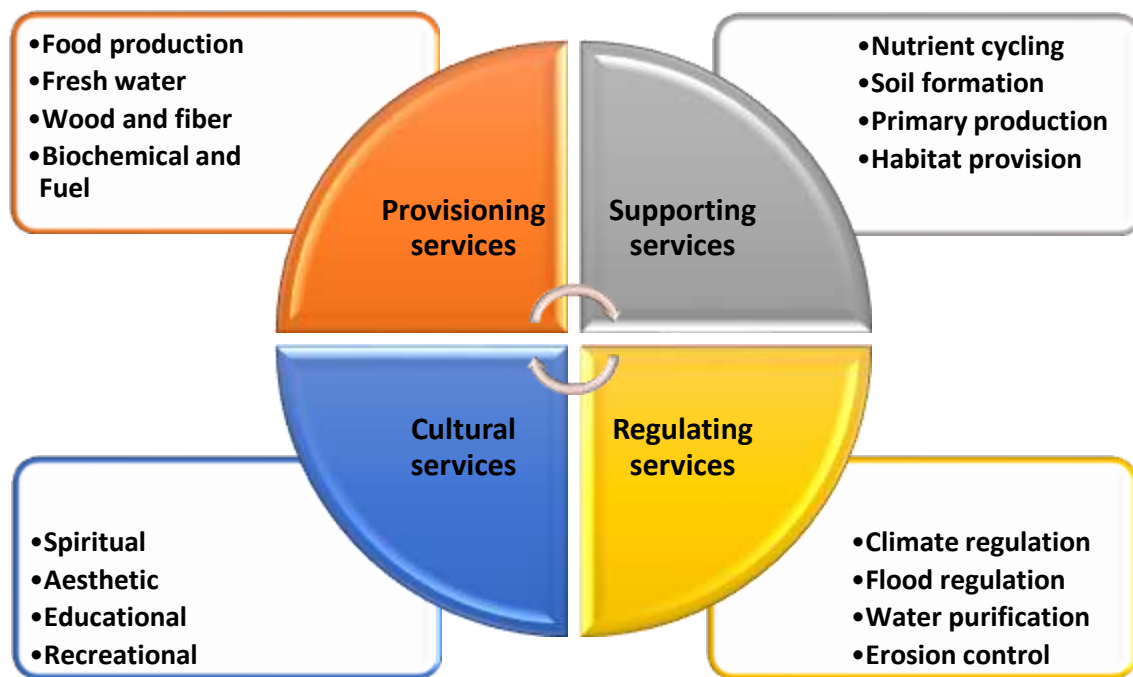


Figure 1.1: Types of ecosystem services provided by or derived from wetlands (MEA, 2005).

It is worth taking into consideration that a wetland system may not necessarily provide the full range of listed services. This is due to the fact that a particular wetland provides services which are determined by its characteristics and specific factors such as climate, geology, topography and its size (Jogo, 2010; Bassi et al., 2014). According to Pollard et al. (2007), wetlands in communal areas mainly represent the most challenging intersection between sustainable management and the livelihood needs of people making use of the wetlands services. Wetlands generally play a significant role in the overall global economy and the International Union for Conservation of Nature (IUCN, 2003) demonstrated the high economic value of the world's wetlands which emphasizes the need for their conservation and sustainable use. The estimated high economic value from the wetlands is mainly driven from water, fish, medicines, timber, reeds and agricultural products (Mehvar et al., 2018). Furthermore, wetlands also have scientific, recreational and historical values (McGlone, 2009; Li and Gao, 2016).

2.3 Wetlands in rural and urban areas in South Africa

2.3.1 Rural areas

Rural communities, particularly those living near wetlands, are highly dependent on wetlands goods and services and are directly affected by their degradation and loss (Dugan, 1990; Wetlands International Africa, 2010). The above mentioned goods and services include water for domestic use; land for cultivation; grazing for livestock; fibre for crafts and construction. Skowno et al., (2019) supports that; everyone depends, directly and indirectly, on wetlands goods and services. It is increasingly evident that wetlands are widely used throughout South Africa to sustain the livelihoods of all the people but more so the rural poor communities (Dugan, 1990; Frenken and Mharapara, 2002; Lamsal et al, 2015). In some cases a wetland can provide the only source of livelihood for poor rural communities and significantly provide much needed services (Dugan, 1990; Lamsal et al., 2015), to individuals whose financial income is already very low.

The increasing pressure on wetlands by rural communities is mostly the consequence of unsustainable use such as extensive conversion to crop fields, poor farming methods, overgrazing, overharvesting, draining, pollution, and excessive population increase (Bond, 2002; Lindley, 2003; Fabricius, 2004). It is therefore important that the local communities be involved in the management of wetlands they depend on. As a result, the local communities should be empowered as custodians, owners and beneficiaries of wetland resources. This is a strategy that promotes participation in sustainable use and takes responsibility for maintaining the quality of the environment and its resources (Nel and Kotze, 2001).

2.3.2 Urban areas

Whilst humanity is increasingly becoming urban, they are still dependent, directly or indirectly, on natural resources such as wetlands for survival and better quality of life (Bolund and Hunhammar, 1999). As in rural areas, wetlands in urban areas are also increasingly becoming under pressure of degradation and loss. The degradation and loss of wetlands in urban areas around the world is mostly due to land development which is increasing as population increases (McCauley et al., 2013a). Besides land development, South Africa has also lost urban wetlands through agricultural activities (Kotze et al., 1995). A study on Ga-Mampa wetland in South Africa showed that the community witnessed the depletion of important wetland products such as sedge and reeds with no alternative source in the area, due to continued wetland conversion to agricultural land (Adekola et al., 2008). According to UN (2014), over 50% of the Earth's human population now resides in cities, towns, and urban settlements and it is predicted that the urban population will continue to grow at an average rate of up to 66% by 2050 (UN, 2014). McInnes (2010) indicated that rapid urbanization will consequently continue to threaten wetlands in two principal ways:

- Direct conversion of wetlands: to resident and commercial developments, consequently leading to severe problems associated with direct habitat loss leading to more extreme flows during floods and drought conditions, polluted drainage, overexploitation of wetlands and the increased prevalence of non-native invasive species.
- Wetlands-related impacts due to urban development: including increased demands for water, increasing spread and source of pollution and the need for greater agricultural production to support the rapidly increasing urban population.

2.4 Wetlands international recognition

In 1975, South Africa became the first African signatory to the Ramsar Convention (Whyte and Shepherd, 1990). The Convention obligates the government of this country to protect designated wetlands (Whyte and Shepherd, 1990). Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation of wetlands and their resources (Ramsar Convention, 2000). This intergovernmental treaty was adopted on 2 February 1971 in Ramsar, Iran and the treaty came into full force in 1995 (Ramsar Convention, 2000). The Convention currently has 170 contracting countries and over 2000 designated sites covering over 200 000 000 hectares globally. The designated sites are now referred to as wetlands of international importance for special protection as Ramsar sites. The contracting parties are responsible for designating wetlands of international importance and ensure that policies are put in place and implemented (Ramsar Convention, 2006).

In response to unsustainable use of wetlands, the Ramsar Convention (Ramsar Convention, 1991) developed ‘wise use’ (WU) of wetland concept for working towards sustainable utilization to benefit these ecosystems and humankind. According to the Ramsar Convention (Ramsar Convention, 2010a), ‘wise use (WU)’ of wetlands is defined as the maintenance of their ecological character, attained through the implementation of ecosystem approaches within the context of sustainable development. Therefore, the WU of wetlands serves human interests and conserve natural ecosystems at the same time. The WU concept involves the provision of maximum benefits derived from these natural ecosystems to the current generation and at the same time maintaining its potential for the future generations (Ramsar Convention, 2010a; Tiega, 2011). The concept of WU gives emphasis on the integration of ecological, economic, and social dimensions in the process of managing natural resources (Jyoti and Hemant, 2003; Gell et al., 2016). For sustainable

wetland management processes to be successful there are three groups which should be involved in the process: national decision makers, conservationists and the local community (Martini et al., 2017). However, strong guidelines are essential to comprehend sustainable management of wetlands. Therefore, it is crucial for both across-the-board investors and local communities to use wetlands wisely. In addition, there is also a need for local communities to be equipped to utilize wetland resources in a more sustainable way.

South Africa currently has 23 Ramsar sites designated as wetlands of international importance, these benefit from greater support and protection (Ramsar, 2019 (accessed: 20/03/2019)). The 23 sites covers only a surface area of 557 028 ha out of estimated 2 846 258 ha of wetlands (Ramsar, 2019 (accessed: 20/03/2019)). The convention covers around 20% of South African wetlands and the remaining non-Ramsar sites are still under threat (Herbst, 2015). Below is Table 2.1 that shows wetland classes and their total surface area in hectares. It also gives the percentage of all wetlands and percentages specific to South Africa.

Table 2.1: Percentage surface area of inland wetlands proportional to all wetlands of South Africa (van Deventer et al., 2016)

Wetland class	Total surface area (ha)	Percentage of all wetlands (%)	Percentage of South Africa (%)
Level 1			
Estuarine:	165 952.8	5.8	0.1
Inland artificial:	528 188	18.6	0.4
Inland natural:	2 152 118	75.6	1.8
Total	2 846 258	100	2.3

**calculated from a shape-file totalling 122 081 147.5 ha for the Republic of South Africa*

2.5 Programmes aimed at addressing wetland degradation and loss

According to the Department of Environmental Affairs and Tourism (2012), existing wetland conservation policies are failing because they're being undermined by economic development imperatives. Over the years, the number and scale of wetland loss and degradation have grown considerably (Macfarlane et al., 2016; Skowno et al., 2019). The South African government acknowledged the concern as requiring urgent attention (Macfarlane et al., 2016). In response to this concern, programmes focusing primarily on wetlands management and restoration such as the Working for Wetlands (WfWet), and wetland community-based natural resource management (CBNRM) schemes were provided with more attention. The primary focus for these programmes is to restore, manage and conserve wetlands.

2.5.1 Working for Wetlands

Working for Wetlands (WfWet) is a national wetland rehabilitation programme launched by the government in the year 2000 and is a joint initiative by the Department of Environmental Affairs (DEA); Department of Water and Sanitation (DWS); and Department of Agriculture, Forestry and Fisheries (DAFF) placed under the management of the South African National Biodiversity Institute (SANBI) (Wilkinson et al., 2016). The WfWet programme was established in response to the wetlands loss and degradation challenges with the aim to protect, maintain and enhance the benefits they provide. Working for Wetlands is structured to rehabilitate degraded wetlands and protect pristine wetlands throughout South Africa (Wilkinson et al., 2016). The SANBI Working for Wetlands Strategy (2006-2010) estimated that by 2025, South Africa will be one of the fourteen countries classified as “subject to water scarcity”.

Since its inception, the WfWet programme has been involved in over 900 wetlands amounting to about 700 000 hectares across South Africa. Since wetlands are not easy to recognise and map, the WfWet programme houses the National Wetlands Inventory Project (NWI) with the aim to provide clarity on the extent, distribution and condition of wetlands in South Africa (Wilkinson et al., 2016). The NWI project produce data with the purpose of identifying which/ how many rivers and wetlands are in need of what kind of attention, as well as to produce a comprehensive national wetland map (Wilkinson et al., 2016).

2.5.2 WWF - Mondi Wetlands programme

The WWF-MWP is one of the longest running and privately funded programme in South Africa (Silima, 2007). The programme has stimulated positive perception and understanding towards the important role of wetlands play, primarily for the benefit of human beings and the overall biodiversity. The fundamental components of WWF-MWP continued success is partnerships and understanding formed between key players in the field of wetlands conservation (WWF-MWP, 2016). The success of WWF-MWP has been driven from partnerships between dynamic, passionate and highly committed individuals, government, non-government groups and other companies (WWF-MWP, 2016).

In 2000, WWF-MWP played a key role in initiating the government's WfWet programme and also provided direct guidance and support for the programme until 2006. Since then, its focus shifted to working in major catchments with industries that have conventionally impacted wetlands and other water resources, like sugarcane production and forestry, using its new "landscape" approach to water stewardship (WWF-MWP, 2016).

2.6 South African rural wetlands protection

It is well known that small wetlands in rural areas do not receive as much attention from conservation organisations compared to large well known wetlands. Only a few organizations have programmes specifically addressing wetland management in rural areas (Nel and Kotze, 2001; Felix, 2002). The environmental management issues in South Africa's communal areas have proven to be complex due to their influence by factors such as ownership, responsibility and trust (Kotze, 1999). It is known that during the apartheid regime, people were forcefully removed from their land to live elsewhere. To a certain extent, those experiences eroded sense of ownership, responsibility, care and trust. One of the results from apartheid was a fostered mistrust between people and the government (Critchley and Netshikvehela, 1998). This also resulted in rarity to find people caring for the environment (Nduli and Versfeld, 1998).

Currently in post-apartheid South Africa, the democratic concept was introduced as a result and this led to some misunderstandings of the meaning of the word "rights", including poor understandings of the relationship between rights and responsibilities (Nduli and Versfeld, 1998). From self-observation and understanding, certain people think they have a right to the natural environment to practice their activities without any consideration of the resulting consequences. Wetlands are gradually becoming the victim of such practices and are thus subjected to poor land-use. Because of these poor land-use practices, wetlands are gradually being degraded and lost.

The government has acknowledged wetland loss as a concerning matter requiring urgent attention (Skowno et al., 2019). Although more focus is placed on larger wetlands, there are few programmes focusing on wetlands, where they encourage the public to participate in the processes of restoring and managing wetlands. The past approaches of land management only fell in the

hands of the government or private landowners. According to Snapp and Heong (2003) and Swanepoel and Barnard (2007) the government service providers were overloaded with the responsibilities, this resulted in difficulties reaching all rural communities and meeting the required targets. However, there has been a paradigm shift in thinking directed towards participatory management of natural resources (Critchley and Netshikvhela, 1998; Dyer et al., 2014). Participatory management is regarded as the practice in which participants take an active role in the decision-making process and engaging with various stakeholders for matters concerning the subject (Critchley and Netshikvhela, 1998). The change of transferring some power and responsibility to people who depend on the wetlands for their daily needs have shown to achieve some success (Critchley and Netshikvhela, 1998; Chirenje et al., 2013; Dyer et al., 2014). The main objective for participatory approach has been to address primary problems associated with poor service delivery in rural communal areas such as guidance to sustainable management poor access to new information and misunderstanding of issues by the local community (Snapp and Heong, 2003; Shrestha, 2011; Were-Kogogo and Anyango, 2017). However, implementing participatory approaches is challenging due to the negative level of thinking and lack of social cohesion.

2.7 Community participation on wetland management

2.7.1 Historical overview

The importance of public participation in decision-making processes and management of natural resources has been debated for many years (du Plessis, 2008; Fitzgerald et al., 2016). In some cases, poor participation of local communities in the planning, implementation and monitoring of development projects and programmes were linked to their failure, resulting in wasted expenditures without producing expected results. This resulted in poor service delivery for many

developing countries (Rahnema, 1992; Karl, 2000; Fabricus, 2004; Chirenje, 2013). Support for participation can be justified through its ability to presents the platform for majority to express their will and also ensure that significant cultural and economic objectives of social development can be attained. It is also assumed that participation present a platform for improved dialog and interaction amongst stakeholders making it possible to reach the desired objectives (Rahnema, 1992; Ratner et al., 2018).

There were two mechanisms that formed the backbone of community participation and these are: 1) the participation of local communities in matters that concern them, in an effort to improve their livelihood through relying on their own initiatives; and 2) providing support in ways that encourage initiative and effective empowerment (Huizer, 1997). According to Huizer (1997) and Marzuki (2015), participation has also been used as a strategy to address critical challenges in planning for new developments. Some approaches of participation in development and empowerment of the previously excluded and disadvantaged communities created much enthusiasm (Rollason et al., 2018). However, there was not enough evidence to support that participatory approaches have resulted in the development of new knowledge and improvement in the management processes (Mathur, 1997).

One of the main challenges in the process of participation is that it requires consulting and interacting with numerous and wide range of stakeholders. For example: government departments, non-governmental organizations, academic institutions, international and national research institutions, consultative groups, local community groups and individuals may all be participating in one natural resource management initiative, where all efforts should be recognised. Some of the challenges include a process of reaching and involving many stakeholders, and also the challenges

of socio-economic diversity, cultural diversity and a lot of other dynamics across families (Snapp and Heong, 2003; Bostrom et al., 2011). This study attempts to understand such challenges, by interviewing the identified stakeholders involved in the management of the identified wetlands in the study area.

Although there is a need to invest into stakeholders' development or empowerment, this requires a large amount of financial support (Lotz-Sistka and Burt, 2006). In participation processes, there is a need for huge investment in creating a conducive environment for quality interaction and the development of partnerships amongst stakeholders (Snapp and Heong, 2003). Participation has been perceived as a tool for investment because more can be achieved at low cost when local people participate (Rahnema, 1992).

Participation can take many forms and serve different interests. In the context of wetland resources, participation may include inputs contributing to predetermined projects and programmes, decision-making, information sharing, partnership and empowerment and consultation (White, 1996; Karl, 2000). Participation should seek to encourage collaboration and cooperation amongst role players, empowering local communities as wetland resource users to contribute to policy formulation and management decisions affecting them. It also encourages the management of natural resources in a sustainable way through educational and other incentive-based processes. The intension is to minimize challenges that affect the management of these wetlands (hence this study). According to Kotze (1999), in managing wetland resources, there is a need to employ participation in making decisions that represent the views and ideas of all affected role-players and in building functional community-based institutions.

2.8 Values for stakeholder participation

According to Hemmati (2000), good governance; sustainable management and democracy are primarily the values that seem to form a foundation for processes of stakeholder participation. Each of these values is discussed below in more detail.

2.8.1 Good governance

Natural resource governance refers to the standards and processes that determine how decisions are taken, how the power including responsibilities are exercised, and how residents participate in and benefit from the natural resources being managed” (International Union for the Conservation of Nature (IUCN), 2016). Good governance is driven by the rule of law, reliable administration, legalised power, responsible regulation and it requires participation from all stakeholders (Hemmati, 2000). The following major characteristics of good governance are listed in Hemmati (*ibid*):

- Participation: in a sense that all stakeholders have a voice in influencing decision making,
- Rule of law: all decisions should be within fair legal frameworks that are enforced impartially,
- Transparency: lack of hidden conditions where decisions taken and their enforcement are done in a manner that is open and transparent to all stakeholders, enough information is freely and directly accessible to those affected,
- Accountability: must be accountable to the public and other stakeholders,
- Effectiveness and efficiency: produce results that meets society’s needs in an effective and efficient way while making the best use of resources at their disposal in carrying out roles and responsibilities,
- Response: try to serve all stakeholders within a reasonable time frame to address the needs,

- Consensus oriented: facilitation of different interests in the society to reach a broad consensus on the best interest of the whole community and ways for it to be achieved.
- Equity and inclusiveness: all members (man and women, different race, culture, socio-economic backgrounds, etc) feel included in the mainstream of society.

From the above mentioned characteristics, the study sought to understand how inclusive the wetland management processes are in the study area; wetland information transparency and consensus amongst various stakeholders. Furthermore, the study intended to investigate how resources are distributed and used, and how accountability is ensured.

2.8.2 Sustainable wetland management

Further research on wetlands provides better scientific understanding about these ecosystems and consequently helps determine possible improved management approaches (Islam, 2009; Chuma et al., 2012; Ahmed, 2015). Continued disturbance resulting from both anthropogenic and natural occurrences within/ surrounding the wetlands are evidently affecting services and the values of wetlands across the world (Chuma et al., 2012). Recognising the importance of wetlands, their fragile nature and the distressing conditions of the world's wetlands, several ideas for managing these ecosystems have been provided by scholars of different jurisdictions (Adamus and Stockwell, 1983; Steven and Vanbianchi, 1993; Ahmed, 2015).

Adamus and Stockwell (1983) suggested that scientists and managers dealing with wetlands should recognise three classes of wetlands functions when in the process of preparing management plans and these are: (1) recognising hydrologic functions such as the reduction of flood peak and ground water recharge/ exchange, shoreline, anchoring and erosion control, (2) the process of improving water quality, which includes sediment accretion or nutrient uptake, and (3) wildlife

habitat and food chain support. On the other hand, Stevens and Vanbianchi (1993) emphasised on developing a wetland inventory for proper management of wetlands. They suggested that a wetland inventory should mainly include data on the presence, extent, condition, characteristics, and functions of wetlands within a selected area. According to Stevens and Vanbianchi (1993), such data will aid in documenting the status of a wetland in a given area and support management decisions on more appropriate management approaches. However, wetland management ideas offered by Adamus and Stockwell (1983) and Stevens and Vanbianchi (1993) are to some extent narrow, as they mainly focus on wetland ecologies while overlooking the lives and wellbeing of the communities who have traditionally depended on wetland-based resources.

Some scholars such as Horwitz et al. (2012) and Chuma et al. (2012) suggested that in wetland management decisions, the communities' connection with the wetlands also need to be taken into considerations. Horwitz et al. (2012) and Chuma et al. (2012) highlighted that communities cannot be separated from the wetlands because of their dependency on services provided by these ecosystems for their well-being. It was further suggested that wetland management processes should strive to understand the communities' situation, hopes, and wishes, thereby sustaining their livelihoods (Chuma et al., 2012; Horwitz et al., 2012). However, this debate seems to be neutralised by the concept of sustainability which incorporates both sides of natural resources management principles (McCaetney and Houghton-Carr, 2009; Ahmed, 2015). In general, sustainability refers to the process in which exploitation is done in a balanced manner that still maintains a healthy environment in order to fulfil present needs without compromising their availability for future use (Chuma et al., 2012; Lamsal et al, 2015), and this general definition also correlates with how the Ramsar Convention defines sustainable wetland management. The principal goal for sustainable wetland management is to sustain the health and functions of the

ecosystems with the goal to meet ecological, economic, and social demands of the current users without compromising the need of the future users (Parikh and Datye, 2003; Nhamo et al., 2017). According to Wood (2013), there is a three dimensional sustainability model which shows the intersections of three sustainable management goals (Figure 2.2)

- i) Environment sustainability: focus on sustaining wetland health and functions;
- ii) Economic efficiency: focus on cost-benefit analysis of resources use;
- iii) Social fairness: focus on equitable access to wetland resources.

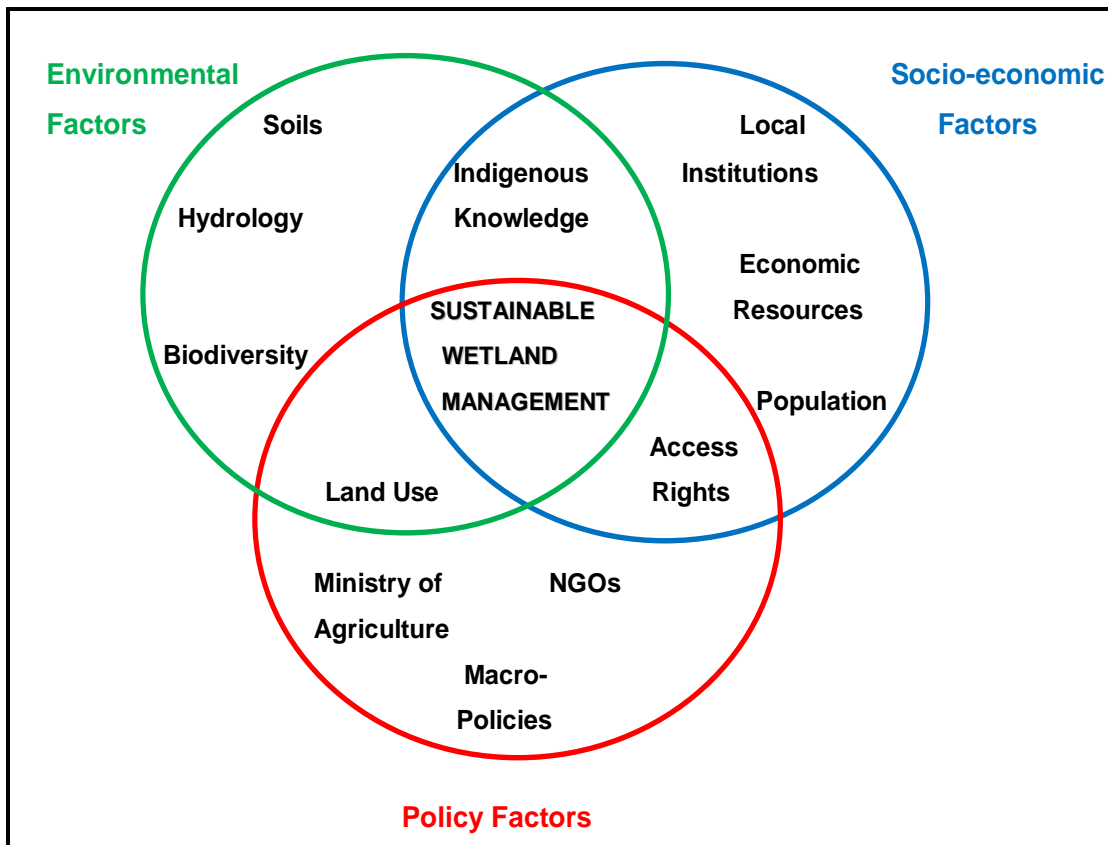


Figure 2.2: Three dimensional sustainability model which shows the intersections of three sustainable management goals, adapted from the Centre for Sustainable Resilient Communities (Wood, 2013).

The sustainability management process requires management regimes to assist in maintaining some of the wetlands natural characteristics while also permitting partial conversion of the wetland

for activities that are needed to meet the economic needs of the communities (Chuma et al., 2012; Nhamo et al., 2017). Thus, for the sustainable management process to be successful, a balance between the natural environmental functioning of wetlands and their use for livelihood purposes by communities needs to be struck. In all cases, sustainable management involves some form of multiple-use regime where a particular land-use pattern is vital for sustaining the functioning of wetland (Chuma et al., 2012). Overall, it is apparent that an integrated wetlands approach is important. There are two dimensions included in the concept of sustainable wetland management which are: (i) the sustainable function and health of the wetland ecosystems, and the (ii) sustainable livelihoods of wetland resource dependent communities. While the ideas of wetland management by scholars such as Adamus and Stockwell's (1983) and Stevens and Vanbianchi's (1993) cover the first dimension of sustainable wetland management, Horwitz et al. (2012) put emphasis on the second dimension, with no specific prescription.

As one of the sustainable wetland management dimensions, livelihood plays a significant role in the sustainability process. A livelihood is generally defined as the means of securing basic necessities of life (Lasse, 2001). On the other hand, Chambers and Conway (1992) proposed a more complex definition: "a livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood can cope when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets, and provide opportunities for the sustainable livelihood of the next generation; and which at the local and global levels, in the short and long term contributes net benefits to other livelihoods". It was also suggested that, assets are the significant building blocks of a sustainable livelihood (Scoones, 1998; Brocklesby and Fisher, 2003; Ahmed, 2009). Furthermore, the availability or scarcity of assets may possibly facilitate or hamper the likelihood of success or failure (Ahmed, 2009). A

sustainable livelihood framework is provided by Scoones (1998) where four types of capital assets which are required for the sustainable livelihood of a community are identified. The types of capital assets include:

- Human capital - developed skills and knowledge; the ability to work; good health that enable people to pursue their livelihood approaches and also achieve their set livelihood objectives.
- Economic or financial capital - income, savings and also credit of dependent communities.
- Natural capital - natural resources in which the communities depend on.
- Social capital - various social attributes such as networking, training and knowledge sharing that help in gaining skills, exchanging knowledge and cooperation amongst communities.

In the concept of sustainability, the idea of sustainable wetland health management by Adamus and Stockwell (1983), and that of sustainable livelihood framework by Scoones (1998) collectively seem to provide a useful tool for assessing the quality of wetland resources management practices. The presence or absence of the four types of assets identified by Scoones (1998) may possibly act as meaningful indicators to determine the extent and whether the issue of sustainable livelihoods are addressed in the process of wetland resources management.

Therefore, by investigating socio-economic and demographic profiles of the communities, the study sought to understand the link between them and unsustainable practices in resource use, and conflicts within the management of wetland resources, with the hopes of contributing towards a solution to any existing conflicts of interests. Thus, sustainability is at the core of the recommendations that will come from this study.

2.9 Stakeholder engagement

The term stakeholder engagement is a broadly constructed and contested concept that refers to a wide range of practices varying according to context (Talley et al., 2016). In the context of natural resource management, stakeholder engagement often refers to the participation of various interested and affected parties around the same topic in planning or decision-making efforts in order to integrate their ideas, knowledge and values towards a common goal (Talley et al., 2016; Novoa et al 2018). The engagement of stakeholders in natural resource management range from very large multinational projects (Kidd and McGowan, 2013) to locally focused projects (Krasny and Delia 2014) that range in geographic, political, and cultural scales. Additionally, stakeholder engagement has been deemed as the best practice for planning and decision making, mainly because it is believed to be more effective and democratic than the top-down, management approaches (Butler and Adamowski, 2015). Some scholars have argued that integrating stakeholders' ideas, knowledge and values in planning and decision-making processes mostly leads to improved governance and accountability (Koontz and Thomas, 2006); although, others have argued that there a differing views concerning the value and effectiveness of stakeholder involvement (Koontz and Thomas 2006; Powell and Colin 2008). Nonetheless, stakeholder engagement is currently recognised and supported by policies, various international conventions, structures concerned with biodiversity and related ecosystems such as the Convention on Biological Diversity, the Ramsar Convention and the Sustainable Development Goals, and others.

According to Sterling et al. (2017), stakeholder engagement is the entry point to developing measures for responding to biodiversity conservation needs and having effective implementation of the objectives. Internationally, various techniques are used to ensure that stakeholders are engaged and these include prior understanding of the scope and purpose of the work to be done

before selecting parties are engaged. It is also crucial to understand the historical context of stakeholders, local community structures, demographic compositions and the value of biodiversity or ecosystems to be secured (Sterling et al., 2017).

South Africa has adopted the stakeholder participation as a legally binding process for any decisions or actions likely to impact the environment in terms of section 24 of the National Environmental Management Act [Act 107 of 1998]. In other cases, stakeholder engagement has become the foundation where projects or developments are halted when participation was not sufficient or done properly (Wernham, 2012). The country has also set the norms and standards for stakeholder participation in the management of public entities. These legal frameworks are used by the government to enhance participation of stakeholders, which in turn contributes to effective management of different ecosystems (Novoa et al., 2018). South Africa also uses democratic principles of consensus-based governance, objective rule of law, access, and recognition of human rights in deciding who has to be engaged (Novoa et al., 2018).

2.10 Factors affecting management of wetlands

National and international communities agree on the common factors hindering effective management of wetlands and they range from: a lack of necessary data or information about wetlands; lack of will or clear motive for protection of wetlands; limited political commitment; or to a lack of financial and human resources (Bobbink et al., 2006; Jones et al., 2009). All of these factors have been said to result in poor management of wetlands (Bobbink et al., 2006). These factors' complexities have been discussed by the international community gatherings at various conferences and workshops with the idea to effectively find long-term solutions. One of the reasons many countries agreed on the need for an international convention on wetlands (the

Ramsar Convention) was the fact that wetlands are poorly managed across the world. However, it is worth noting that wetlands management efforts are different across countries. According to Chatterjee (et al., 2008), there are multiple consequences resulting from the poor planning and management of wetlands.

Wetlands that have been declared as Ramsar sites designated to be of international importance are some of the well-preserved wetlands ecosystems across the world (Ramsar Convention Secretariat, 2007). These wetlands are sustainably managed primarily because they have the required leadership and resources to achieve their set objectives. However, those that are not Ramsar sites often lack the management basics, such as reliable, consistent and accurate ecological information, and this has been revealed to complicate the formulation of policies to safeguard them (Kleijn, 2014). According to Jones et al. (2009), the collation of information on wetlands depends on the co-operation and co-ordination of limited available resources. Additionally, it is worth recalling that wetlands loss due to poor management does not only negatively affect human wellbeings but biodiversity as a whole. South Africa has lost about 60% of wetlands resulting from the continued threats (Skowno et al., 2019) . South African wetlands continue to be threatened by various threats ranging from legal frameworks, prioritization of other needs and competition for resources from an already constrained state budget (Skowno et al., 2019).

2.10.1 Lack or insufficient wetlands data

Appropriate wetlands data are crucial for the sustainable management of wetlands (Jones et al., 2009). It has been indicated that suitable data must encompass a standard vocabulary with similar foundations for inventories of wetlands; an adoption of principles for wetland inventory that are compatible with countries' systems of identifying wetlands; as well as contribution to the scientific

knowledge and understanding of wetlands (Jones et al., 2009). The Millennium Ecosystem Assessment (2005) adds that the data must include all relevant characteristics and composition of wetlands, as well as their geographical distribution. The data must be used consistently for monitoring changes and updating information (Jones et al., 2009). According to the Millennium Ecosystem Assessment (2005), the lack of wetland inventory affects the overall management of wetlands through planning and decision making processes.

Like many other countries, South Africa is striving to identify, list, characterize and classify its wetlands. However, substantial information about the historical occurrence of the country's wetlands is still unknown. At times, the lack of essential data has resulted in the approval of decisions to develop areas that were previously wetlands (Sieben et al., 2014). Occasionally, only natural disasters such as floods play a role in reminding people that a wetland previously occupied the site. Thus, there is a need for proper research to support generating more data on wetlands.

2.10.2 Unresolved issues on land rights or ownership

The United Nations (2009) claim that in many poor and developing countries that were former colonies, rights and ownership including the process of accessing land is a common challenging problem. Countless communities in these countries have been forcefully removed from their land resulting in the loss of connection with the land and resources (United Nations, 2009). According to the Food and Agriculture Organization (FAO, 2011), forced removals have consequentially undermined the indigenous knowledge that abetted protecting natural lands and their resources for many years.

2.10.3 Insufficient skills and capacity for wetlands management

According to Rebelo (2009), one of the common and most critical problems in wetland management is the scarcity of necessary skills and competencies required to manage a proclaimed site. Due to lack of skills, there are reported cases of failed management approaches which have resulted in the misuse of dedicated financial resources intended for the improvement of the proclaimed sites (Rebelo et al., 2009). The right skills and necessary competency ensures sustainable management of the proclaimed wetland sites (Chatterjee et al., 2008). Among other countries, South Africa also lack the skills and capacity for managing proclaimed sites (Skowno et al., 2019). Occasionally, non-government organizations assist authorities with financial resources and personnel to ensure that natural resources are protected (Government of South Africa, 2010).

2.10.4 Overlapping political oversight of wetlands

The implementation of wetland management strategies often requires following and considering political relationships (MEA, 2005). Due to political agreements between parties, some wetlands are left undeclared or vulnerable (Chatterjee et al., 2008). South African wetlands are defined, listed and assessed within the context of the National Water Act (NWA), while their protection falls under the Protected Areas Act (PAA). The NWA is currently under the political administration of the Department of Water and Sanitation, whilst the PAA is under the Department of Environmental Affairs. Wetlands are also a critical component for consideration; however, these departments also have different administrative responsibilities, making it challenging to manage the overlapping administration of wetlands.

2.11 Measures to improve wetlands management

This section focuses on the existing knowledge regarding best-practice standards for wetlands management. Below are ways commonly known to help wetlands survive and thrive, and in the process become a steward of the environment.

2.11.1 Aligning and strengthening legal frameworks for wetlands

Wetlands globally receive overwhelming support in the form of programmes and international conventions to encourage efforts for their management and protection (MEA, 2005). It is widely known that the international community sanctioned the Ramsar Convention to be a treaty that focuses on wetlands (Ramsar Convention Secretariat, 2007). However, in many individual countries like South Africa, wetlands are generally managed as part of the water resources management, natural resources management, or biodiversity management (Ramsar Convention Secretariat, 2012). According to the Ramsar Convention Secretariat (2007), it is often challenging to make penalty provisions for illegal removal or fragmenting wetlands due to the lack of specific legislation that regulate these ecosystems. In individual countries, the development of specifically focused legislation similar to that of the broader international community is crucial in the sustainability of wetlands (Ramsar Convention Secretariat, 2007).

South Africa is striving to follow in the footsteps of the international community to ensure appropriate alignment of legal frameworks in the management of wetlands (Skowno et al., 2019). Additionally, some factors such as the location of wetlands poses problems, more likely if they fall on private land (Cadman et al 2010). In some cases, offsetting becomes an option when the use of a wetland is overshadowed by the use of land for other purposes (Skowno et al., 2019).

2.11.2 Wise-use of the remaining wetlands

The sustainable use of wetlands and their management requires proper planning and taking into consideration the circumstances of all affected parties. Additionally, the empowerment of all users, including landowners, through various programmes and trainings, is crucial in planning the wise use of these wetlands. Co-operation from all relevant stakeholders facilitate proper planning for the wise use of wetlands (MEA, 2005). In South Africa, apart from the legislation, there are several existing programmes supported by both private and public institutions which assist in safeguarding, rehabilitating and restoring degraded wetlands. A majority of these programmes insist on the sustainable management of these wetlands while also considering the livelihood of surrounding communities.

2.11.3 Mobilization of financial resources

Within both the international and local context, financial resources required for the management of wetlands remains limited (Pittock et al 2015). According to Herr (2015), there is a need for countries to invent innovative models for sustainable finance to ensure proper management of the available financial resources. Since the management of wetlands requires large amounts of financial resources, South Africa continues to draw support from government and non-governmental organizations (Cadman et al. 2010), including international and local donors who invest in projects aimed at managing natural resources. This has resulted in enormous improvements in how wetlands are viewed, utilised, and protected by general society.

2.11.4 Empowerment of landowners and general community

The Ramsar Convention Secretariat (2012) stated that there must be a program about the wise use and protection of wetlands dedicated to empower landowners and the general community.

Additionally, there must be recognition of traditional values and customs which are built around sustainable management and the utilization of wetlands (Ramsar Convention Secretariat, 2010b). Simplified formal and informal education about the sustainable utilization and protection of wetlands must be used to empower the community and encourage them to pass this knowledge from generation to generation. Cadman et al. (2010) supports that educational programmes have enabled people to better understand wetlands than previously. In some cases, the surrounding communities including landowners already possess indigenous knowledge which is essential in promoting sustainable utilization of wetlands.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.0 Chapter overview

This section focuses on the research design and the methodology used in this study. To begin with, the delineation of study areas is outlined. Both qualitative and quantitative research design and methodology are discussed. The requirements for developing and administering questionnaires, conducting interviews and observations are outlined for both methods in this section. This section also gives details on the selected study population, sampling procedures and data collection methods, including strength and limitations of the study.

3.1 Study area

The study area is located within the Thulamela Local Municipality (22°57'S, 30°29'E) in the Vhembe District (22°56'S, 30°28'E) of the Limpopo Province, South Africa. Thulamela is a predominantly rural and one of the four local municipalities in the Vhembe District, where seven villages (Maniini, Magidi, Hatshisele (Lufule), Dzingahe, Maungani, Mbaleni, and Duthuni) containing selected wetlands for the current study fall under (Figure 3.1). Thulamela Municipality falls within the savanna semi-arid zone and woodland vegetation (Rosmarin, 2013). The study area experiences seasonal rainfall, with high rainfall of over 1500 mm being experienced during summer (i.e. November to March) (VBR, 2012). Low rainfall is experienced during winter and spring months (VBR, 2012).

A preliminary field survey was undertaken to collect data on location and accessibility to all wetlands areas. The locations of each wetland were recorded through the use of a Global Positioning System (GPS). The map below indicates the locations of all these wetlands.

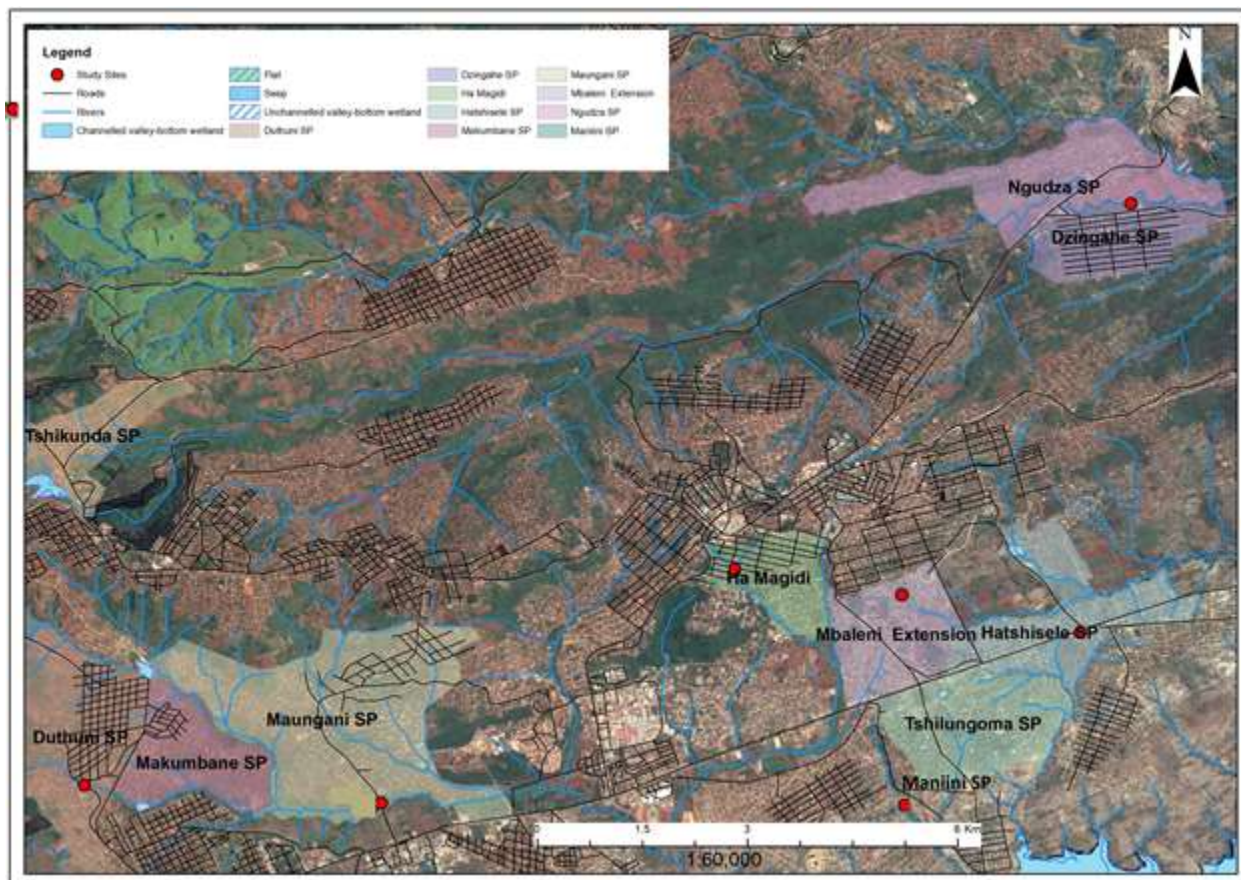


Figure 3.1: Map showing all seven selected study areas within Thulamela Local Municipality.

The administrative center of the municipality is the town of Thohoyandou, with an estimated population of 69,453 residents (Stats SA, 2012). According to Stats SA (2012), Thulamela Municipality covers an area of approximately 5,835 km², the population size was estimated at 618,462, and the number of households 156,594 (Table 3.1).

Table 3.1: Location and demographic details of the Thulamela Local Municipality, and villages with wetlands selected as study areas (Stats SA, 2012).

Thulamela Local Municipality (2012)					
Area	5,834.70 km ²		Gender	Female: 339,812 (54.94%) Male: 278,650 (45.06%)	
Population	618,462 (106.00 per km ²)		Employment	Employed: 75,592	
				Unemployed: 58,917	
Households	156,594 (26.84 per km ²)		Education	Higher education: 12.5%	
				Matric: 28.6%	
				Non-schooled: 8.7%	
Villages where wetlands were selected					
Village name	Area (km ²)	Population size	Village name	Area (km ²)	Population size
Duthuni	6.70	6,345	Magidi	1.71	3,772
Dzingahe	2.14	2,862	Maniini	2.88	5,383
Hatshisele (Lufule)	1.38	1,617	Maungani	7.48	7,271
Mbaleni	2.42	4,128			
Location of wetlands (study area)					
Wetland located village		Latitude		Longitude	
Duthuni		-22.982434		30.389594	
Dzingahe		-22.907838		30.523931	
Hatshisele (Lufule)		-22.962907		30.517416	
Mbaleni		-22,958033		30,494515	
Magidi		-22.954788		30.473087	
Maniini		-22.985579		30.426371	
Maungani		-22.984740		30,427695	

3.2 Research design

It has been recognised that the analysis of stakeholder participation involves analyzing complex social behavior (Connole, 1998; Janse van Rensburg, 2001). Connole (1998) and Janse van Rensburg (2001) proposed that a variety of research orientations that emphasize the potential of interpretive, qualitative and quantitative approaches for analyzing social complex behavior. Therefore, this study focused on both qualitative and quantitative research methods for data collection from the study areas. Both methods have proven to give positive results in identifying important issues concerning communities and the management of natural resources (Flint, 2006; Tashakkori and Teddlie, 2003). The study involved undertaking an in-depth stakeholder analysis concerning the management of wetlands. This study employed commonly used tools in interpretive research approaches which are questionnaires, interviews and observations.

Study population

A study population can be described as a subset of the population that poses the characteristics of interest defined by the eligibility criteria. In this study, experts relevant in the field of study and the local communities living in close proximity to the study areas were selected as participants. This was based on their specialised expertise and involvement in the area of study. In this qualitative phase, the study population comprised of departmental officials in the positions of natural resource management; personnel from initiated wetlands management programmes and tribal authority members. The tribal authorities are as important in the management of wetlands because they have control over their communities in most rural parts of the Limpopo province.

Sampling

Sampling generally refers to the selection of a subset from a larger population with the intention of representing a particular population (Gall et al., 2007; Scott and Morrison, 2007; Etikan et al., 2016). In this study, the *probability sampling* and *non-probability sampling procedures* were used to select relevant, knowledgeable and experienced participants. Probability sampling refers to the procedure in which every unit in the study population has an equal chance of being selected in the sample and this probability can accurately be determined (Adwok, 2015). According to Cozby (2009), a non-probability sampling procedure involves the selection of elements based on assumptions regarding the population of interest, which forms the criteria for selection. Probability sampling was used in selecting experts and the non-probability sampling used to select tribal authority and other community members.

In this research, all participants of this research phase were purposefully selected based on their involvement in wetlands management and close proximity to the wetlands. To ensure that the number of participants were sufficient, sampling was based on the saturation principle of diminishing returns; the impression that each additional unit of information would supply less new information than the prior: until new information was reduced to nothing (Thiétart, 2007; Rowlands et al., 2015). Thus, the saturation principle guided the investigator in determining the threshold number of participants in order to compile a reliable and valid survey.

Snowball sampling

The study also made use of snowball sampling method and comprehensive sampling. In snowball sampling, each successive (following) participant is named by the preceding (previous) participant.

Each participant was asked to suggest other particular participants that may have information or knowledge about the research problem until all leads were exhausted.

3.2.1 Qualitative data collection

Yilmaz (2013) define qualitative data collection as an emergent, inductive, interpretive and naturalistic approach to the study of people, cases, phenomena, social situations and processes occurring at their natural settings in order to reveal the significance that people attach to their experiences. The reason for employing this method was to ensure that officials involved in the management of study areas would take part in the data collection process.

According to Creswell (2009) and Kumar (2011), the characteristics of the qualitative research method include and are not limited to: i) usually conducted in natural settings, ii) begins with more general open-ended questions moving towards greater precision as more information emerges, iii) it is of non-manipulative and controlling nature, iv) resolve problems through obtaining detailed understanding of the fundamental phenomenon, v) extensively use descriptive data and describe a phenomenon with words, rather than numbers, vi) require a small number of participants for data collection.

Different measuring tools were employed to yield data for the qualitative research phase. The measuring tools include semi-structured interviews and observations (Cooper and Schindler, 2011).

3.2.1.1 Semi-structured interviews

The interview process is one of the familiar strategies used in collecting qualitative data. The intention for any qualitative research interview is to address the key questions from the

perspectives of the interviewees and to understand the reasons behind those perceptions (King, 1994). This phase only focused on semi-structured interview because the structured interviews often produce quantitative data. Semi-structured interviews are tools that assist in developing an in-depth understanding of qualitative issues and obtaining suggestions and recommendations from key informants. They may thus provide a basis to explore new ideas that have not been discussed before. The following were the steps followed in conducting interviews (Figure 3.1):

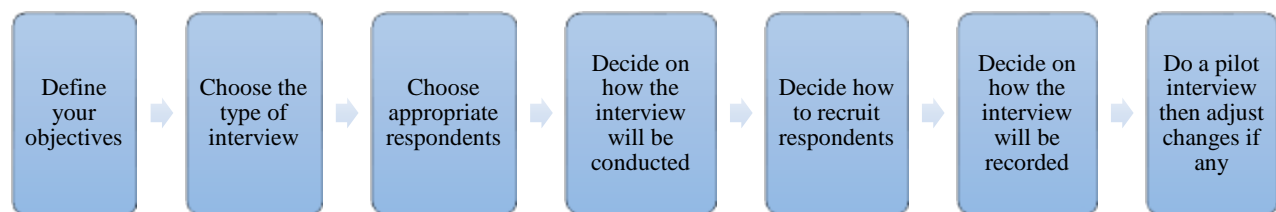


Figure 3.2: Steps followed in conducting interviews.

Semi-structured interviews prove to be useful when there is a need to systematically collect in-depth information from a number of participants or interviewees. In a semi-structured interview (SSI), the interviewer focuses on a set of predetermined questions, but allows the respondents to give their own answers without being constrained or restricted (Dalati and Gómez, 2018; Young et al., 2018). This method allows the interviewer to probe further and ask supplementary questions for clarification based on the respondent's answers. For SSI questions to be administered (Appendix A). The interview questions were prepared and structured in a way that allowed the investigator to gain insights into stakeholders' perceptions towards participation and the roles they play in partnerships, and to further generate insight into their interests.

The initial plan was to conduct the interview with personnel representing relevant governmental and non-governmental institutions. The interview process and the selection of interviewees were discussed with relevant identified stakeholders in a setup meeting and any suggested possible

platform in order to ensure establishment of understanding and trust. A letter requesting to interview personnel was submitted to the relevant institution. In order to minimize misinterpretation of data, a digital voice recorder was used to record participants' responses, though two of the participants chose to write their responses instead. Participants chose where they felt most comfortable to do the interview, though it was a public or professional setting. A total of five interviews were conducted in four governmental departments with personnel who were willing to participate. All interviewees were provided with a copy of the interview questions, letter of consent, study summary, university study approval and contact details of the research leaders for possible queries or additional information.

3.2.1.2 Observations

Observation is defined as a systematic data collection approach where researchers spend time observing the work by people in their natural setting or naturally occurring situations. In this study, observations were carried out at some of the study areas. The intention was to identify and observe local communities as they use wetlands areas. The observation was done following Kemmis and McTaggart (2000). The tribal authority members, wetlands management programmes' officers and individuals in local communities were included in the study. The scientist was at some point a participant observer for the reason that it comes with a lot of benefits, as it allows for ongoing listening, participation, watching and learning, and establishing relationships based on trust and cooperation. The implication of being a participant observer is that your intentions are known by those who are part of your observation process (Ferreira et al., 1988).

3.2.2 Quantitative data collection

Quantitative research is a scientific method of observation which is commonly defined as an objective, formal, systematic process in which numerical data are used to gather information (Burns and Grove, 1993). The characteristics associated with quantitative method are objectivity, reliability and numbers, and data needs to be structured in a form that can immediately be transposed into numbers. Thus, the results from the research can be generalised and in this study the quantitative method was employed mostly to analyse gender and generalize the age of people using the wetlands (Hyett et al., 2014). According to Lund (2005) and Thiétart (2007), quantitative research deals with the statistical analysis of numerical data in order to provide quantitative results. Quantitative research requires objectively evaluating data which consists of numbers and trying to eliminate bias from the investigator's perspective (Hyett et al., 2014). The quantitative method primarily makes use of structured questions in a form of questionnaires.

3.2.2.1 Standardised questionnaire

A formal standardised questionnaire is a survey instrument used to collect required data from individuals. A questionnaire is said to be standardised when all respondents are to be exposed to the same questions and the same system of coding responses (Boynton and Greenhalgh, 2004; Bell et al., 2016). Standardised questionnaires were used with the primary aim to ensure that differences in responses to administered questions could be interpreted as reflecting differences amongst respondents, rather than differences in the process that produced the answers (Siniscalco and Auriat, 2005). The questionnaire was designed to reflect open-ended and closed questions. Households were selected with the use of a stratified random sampling technique. The survey targeted the eldest member (18 years and above) of the household who was present. The study

aimed to administer 140 questionnaires from all study areas. Individuals from the local communities completed the questionnaires as indicated by Dalati and Gómez (2018).

All questionnaires were hand delivered to reduce the number of non-respondents. The respondents were humbly requested to complete the questionnaires in a given time period. Where the participants could not read, write or did not wish to write, the questionnaires were administered as an interview using the local dialect. Thus, in favour of individuals who did not understand English, the questionnaire was translated into a common local dialect, Tshivenda in this case. This ensured the relevant questions are administered to the relevant people, and minimized gaps in responses to questions.

In order to minimize the occurrence of possible shortcomings, the following strategies were employed (Leedy and Ormrod, 2010; Rubin and Babbie, 2011);

- Respondents were given clear and consistent instructions for the completion of questionnaires;
- Questionnaire items were analysed to avoid any content that promotes bias, e.g. presupposed and leading questions;
- Reporting of observational factors that describe the contextual situation of the data; and
- Follow-up actions to non-respondents of questionnaires.

Irrespective of the sampling method used, one had to confront the problem of non-respondents to questionnaire surveys. Based on the view that low response rate leads to a smaller final sample, consequently resulting in less “statistical power” to test the hypotheses, a number of tactics for maximizing the response were used. These include:

- Keeping the questionnaires sufficiently short and engaging;

- Minimised cost (e.g. completion time) and effort to the respondents;
- Promise and be certain to provide feedback to all the participants in the study;
- Follow-up actions to the respondents.

Reliability and validity

Reliability and validity are the key aspects of all research, as giving them careful attention can determine between poor and good research, and thus assisting fellow scientists accept findings as credible and trustworthy (Brink, 1993; Bolarinwa, 2015).

According to Selltiz (et al., 1976), reliability focuses on the informants' accounts by looking at the consistency, stability, and repeatability as well as the researchers' ability to collect and record information accurately. In the process of assessing the reliability of study findings, it is required for the investigators to be knowledgeable in order to make judgments about the 'soundness' of the research in relation to the application and suitability of the methods undertaken and the veracity of the final conclusions (Noble and Smith, 2015).

Validity is concerned with how accurate and truthful the scientific findings are (Le Comple and Goetz, 1982; Bolarinwa, 2015). According to Noble and Smith (2015), qualitative research often gets criticised for: poor justification of the adopted methods; analytical procedures lacking transparency and scientific rigour, and that the findings are merely a collection of personal opinions subject to researcher bias. In qualitative research, rigour refers to the demonstration of integrity and competence by adherence to detail and accuracy in order to ensure authenticity and trustworthiness of the research process.

Through carefully constructed steps, this study was committed to ensuring that all measures to maintain reliability and validity of the data were in place. A representative sample for the study was ensured by using mixed methods, with qualitative corroborating quantitative data. All questionnaires were drafted in English and translated verbally into a local dialect for improved understanding by the respondents. Furthermore, questionnaires were self-administered to ensure the responses were from the intended subjects which safeguarded a high response rate. Besides the contact with participants through questionnaires, prior to data collection, the study also made use of a desktop review of existing literature about wetland management and the local communities' connection with associated wetland, at national and international scales.

Interviews conducted in the study were voice recorded to avoid misinterpretation of data. Additionally, all information obtained from government documents was audited and approved by government personnel (and related institutions) before release to the public. Rather than attempting to use data to generalize inferences, it was used to better understand observed phenomena. Thus, the limitation to this study was that it cannot speak to the general state of affairs of wetland management, but has improved the understanding of the challenges specific to this context. The researcher therefore recommends replication of this study in other places that can then be compared to this study in the future. This phase ensured the authenticity and trustworthiness of this research by applying the above criteria and by following the three basic qualitative research key questions: *What was done; how it was done; and why it was done.*

3.2.3 Data analysis

In order to achieve the objectives of the study, qualitative and quantitative method, observations and document analysis were used to gather the necessary data.

For quantitative analysis, data collected using questionnaire surveys were coded and quantitatively analysed using the Statistical Package for Social Sciences (SPSS). Data capture was done using Microsoft Excel 2013, which made it possible to transfer the data in the required format into SPSS.

Prior to the analysis, captured data were coded according to the levels of measurement. This allowed for uni- and bivariate data analyses. Data analysis was done using SPSS (SPSS version 25). Chi square and Cramer's V value were calculated and analysis was set at 0.05 confidence level.

Univariate analysis refers to the investigation of a single variable for purposes of description. Bivariate analysis is the simultaneous analysis of two variables in order to test a relationship (Babbie, 2010:426, 436). Univariate analysis was used in order to describe and identify relationships that must be taken into account for wetlands management in the Thulamela Municipality. Frequency tables and bar graphs were generated (univariate analysis). Frequency distributions describe the number of times the different attributes of a variable are observed in a sample. This allows for the comparison of different variables.

With regards to the bivariate analyses, statistical tests of significance were conducted on the levels of awareness and general perceptions in order to explore independent variable (e.g. gender; age; level of education) differences. Chi-square tests were used to calculate significant differences in the awareness/perceptions of the community members with regards to wetlands management and utilization (Babbie, 2010:483). A 95% level of significance was used, which is most commonly used in social research (Fielding and Gilbert, 2006:270).

Cramer's V, on the other hand, is the most widely used nominal association used to measure the strength of relationship regardless of the data set sample size. Cramer's V was used to measure effect size. Cramer's V measures the strength of relationship for any size of contingency table and it offers good norming values from 0 (zero) to 1 (one) for relative comparison of the strength of correlation regardless of the table size. It is worth mentioning here that Cramer's V is an index of the strength of association only. Additionally, the limitation of Cramer's V is that it cannot be utilised to compare the strength of one relationship to another correlation. For Cramer's V, 0.0 to 0.30, the strength is considered no relationship to weak; for Cramer's V, 0.31 to 0.70, the strength is considered moderate relationship; while for Cramer's V from 0.71 to 1.0, the strength of the relationship is considered strong (Essien, 2015).

All qualitative data collected, including responses received from the interviews and findings from observations and documents, were analysed using thematic analysis by grouping relevant data. This method was used to identify, analyze and interpret themes across data sets (Braun and Clarke, 2006). Themes were identified on the role of different institutions; challenges encountered under the existing institutional arrangement regarding wetland management; and proposed measures to improve wetland utilization, management and conservation amongst other study variables. The emerging categories from collected data were quantified and presented in tabular format.

Ethical considerations

Ethics refers to a philosophical term that deals with the moral principles and values which govern an individual's behavior (Gratton and Jones, 2010). Thus, in science, ethics deals with the wrong and the right when conducting research. Ethics guided the study to ensure moral principles and values. Hence, a detailed application was submitted to the University's Research Ethics Committee

(REC) for approval to conduct the research and was approved with the ethics number: SES/18/ERM/20/0312. Therefore, it was ensured that the rights of all participants were respected at all times and ethics complied with the guidelines provided by the Faculty of Ethics Committee. The intension of the study was outlined to the participants and elaborated on how the data will be used as well as where it will be kept. The researcher also carefully explained to the participants their right not to participate or disclose their names should they wish to participate anonymously in the study. Therefore, pseudonyms were used in order to protect the participants' identity and their rights. During the process of designing and conducting the research, attention was paid to the following ethical considerations: Anonymity and confidentiality; Informed consent; Deception; and Accuracy (Christian, 2000).

CHAPTER 4: RESULTS

4.0 Chapter overview

The purpose of this chapter is to present, analyze and interpret all the collected qualitative and quantitative data to determine the challenges affecting the management of Thulamela wetlands based on selected study areas. Household questionnaires had various sections, where one section captured information on socio-demographic characteristics of households including size, duration of stay, period of wetland use, and respondent's age, gender and education. The other sections of the questionnaire collected information on the utilization of wetlands and households' perceptions on wetlands and their management, participation in conservation of wetlands and their resources. The results are presented in a form of tables and graphs, where each theme has empirical data that attempts to explain the findings which are specific to the research questions.

4.1 Local communities

4.1.1 Socio-economic characteristics of respondents

The respondents' backgrounds were derived from the data collected through a questionnaire and direct field observations at both sites. Data are presented in terms of the following variables: age at the time of survey, gender, level of education, household size, household head, and household income.

4.1.1.1 Respondent's location and sample size

The sample was drawn from a total of 140 households within seven identified wetlands locations in Thulamela Local Municipality (Table 4.1). The households were selected due to their

proximity to the wetlands. The frequency and percentage of the respondents for each study area is shown in Table 4.1.

Table 4.1: Location of the respondents and sample size.

Study area (Location)	Number of respondents	Percent
Dzingahe	27	19.3
Duthuni	26	18.6
Maungani	21	15.0
Maniini	20	14.3
Magidi	17	12.1
Mbaleni	16	11.4
Hatshisele (Lufule)	13	9.3
Grand Total	140	100

4.1.1.2 Respondents' age, gender and family size

The respondents were drawn from a wide range of ages as shown in Table 4.2. The youngest respondent was 18 years old and the eldest was 72 years, and the mean age of the respondents was 34 years. The low standard deviation indicates that the ages were close to the mean and not spread evenly through to the highest age (Table 4.2). The average family size in the sample was five, with smallest family having two members and the largest consisting of eleven.

Table 4.2: Descriptive statistics for the ages and family size of the respondents.

	Sample size	Minimum	Maximum	Mean	Std. Deviation
Respondents ages	140	18.00	72.00	34.3429	12.72044
Respondents family size	139	2.00	11.00	5.1727	1.50327

Gender and age distributions (Figure 4.1) show that there was a high percentage of female respondents 88 (62.9%) compared to male respondents 52 (37.1%). Most respondents were between the ages of 21 and 50 years with a very few over the age of 60 years.

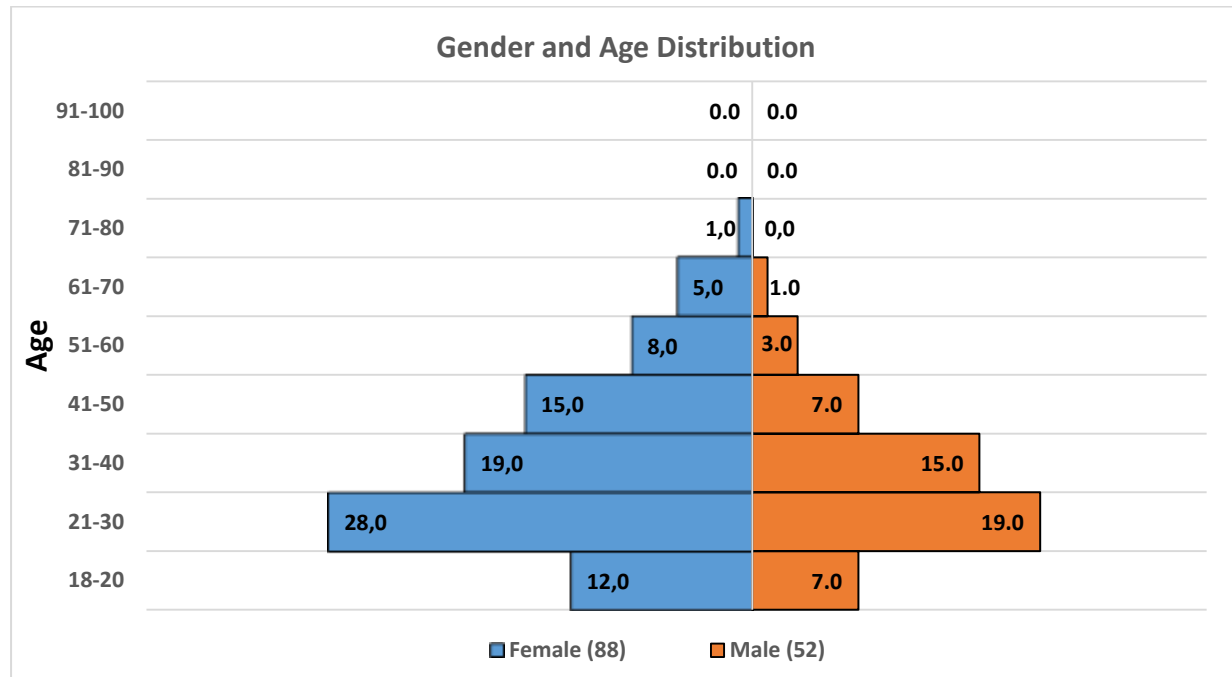


Figure 4.1: Gender and age distribution of the respondents.

4.1.1.3 Families' household heads

The household heads of the respondent families were identified and recorded in the table below (Table 4.3). A high frequency and percentage of 31 (22.5%) show that both parents in the family were the household heads while mothers alone constituted 30 (21.7%) and fathers 26 (18.8%). The mother working together with the extended families made up to 13 (9.4%). Other household heads include extended families, grandparents and young siblings, but separately, these constituted a very low percentage of less than 5%. Data below shows that different families have diverse household heads ranging from one to three per family (Table 4.3). The data revealed that both parents constituted the highest percentage 31 (22.5%) as household heads in the family. Mothers alone as household heads are high in numbers 30 (21.7%) than fathers 26 (18.8%). Mothers

working together with the extended family shows 13 (9.4%) percentage, mothers and children 6 (4.3%), fathers and extended family 6 (4.3%), grandparents 6 (4.3%), fathers, children and extended family 5 (3.6%), mothers, children and extended family 4 (2.9%), grandparents and extended family 3 (2.2%), both parents and extended family 3 (2.2%), children 3 (2.2%), both parents and children 1 (0.7%) and fathers and children 1 (0.7%).

Table 4.3: Household heads of the families sampled.

Who is a household head in this home?	Frequency	Percent (%)
Both parents	31	22.5
Mother	30	21.7
Father	26	18.8
Mother & extended family	13	9.4
Mother & children	6	4.3
Father & extended family	6	4.3
Grandparent/s	6	4.3
Father, children & extended family	5	3.6
Mother, children & extended family	4	2.9
Grandparents & extended family	3	2.2
Both parents & extended family	3	2.2
Children	3	2.2
Both parents & children	1	0.7
Father & children	1	0.7
Total	138	100

4.1.1.4 Source of income per household

The results below reveal that the highest percentage (35.5%) of the household heads was employed while 23.2% were self-employed (Figure 4.2). Employed; and self-employed respondents

constituted 11.6%, while those who were employed and also received social grants made up 10.1%. The rest of the respondents constituted less than 10% through self-employment, remittance and social grants.

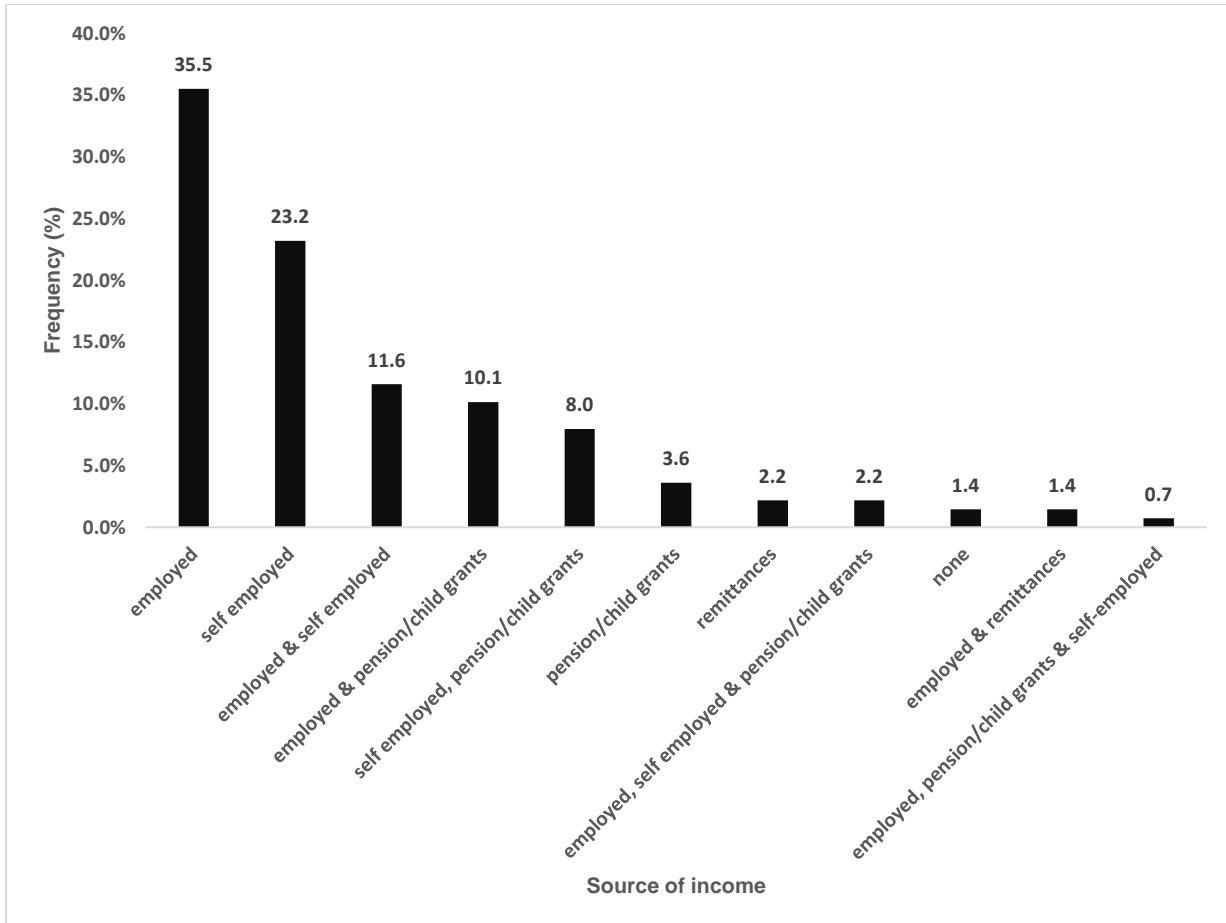


Figure 4.2: Sources of income by various family members per household.

4.1.1.5 Household expenditure

A total of 70 respondents revealed their estimated household expenditure per month while the rest of the participants did not feel comfortable to reveal their household finances. Data show that the minimum household expenditure per month was R500 while the maximum was R2000 (Table 4.4). The mean for the respondents' household expenditures was R4647.86 while the lower standard deviation reveals the uneven spread of the expenditures from the minimum to maximum

amounts. Analysis of the respondents' monthly expenditures indicates that the socio-economic living conditions of the communities were relatively low.

Table 4.4: Descriptive statistics for the total household expenditure per month.

Sample size	Minimum	Maximum	Mean	Std. Deviation
70	500	20000	4647.86	3967.736

4.1.2 Educational level and awareness on the presence of wetlands in the area

4.1.2.1 Respondents' education

The results in Table 4.5 shows that at least 45.7% of the respondents' had attained a tertiary education, 29.3% grade 12 and the combined combined 22% had achieved grades 4 to 11. While only 2.9% had never attained formal education; giving high literacy levels in the study areas.

Table 4.5: Respondents' highest level of education.

Highest level of education	Frequency	Percent
Tertiary	64	45.7
Grade 12	41	29.3
Grade 7	20	14.3
None	4	2.9
Grade 10	3	2.1
Grade 11	3	2.1
Grade 4	2	1.4
Grade 5	1	0.7
Grade 8	1	0.7
Grade 9	1	0.7
Total	140	100

4.1.2.2 Formal and informal education about wetlands

The results in Figure 4.6 below show the frequency and percentage about wetlands formal and informal education received by the respondents. When the respondents were asked if they have ever received any formal education about wetlands, 108 (77.7%) replied no while only 31 (22.3%) said yes they have received formal education before. The table shows that a high percentage (63.0%) of those who responded on where they received formal education said school, 18.5% said college, while a very low percentage (3.7%) mentioned government institutions and the University of Venda. According to the findings, a very high percentage 111 (79.3%) replied no when asked if they have ever received informal education, while 28 (20.0%) acknowledged having received informal education. A high percentage of those who had received informal education mentioned the elders/ community members as the source of the education, while others mentioned radio, awareness campaign, other farmers, internet, tribal authority and workshops. From all the respondents, only one individual 1 (0.7%) replied yes to ever trying to implement any education method to protect wetlands.

Table 4.6: Formal and informal education (about wetlands) received by the respondents.

Question and answer	Frequency	Percent
Ever received any formal education about wetlands?		
No	108	77.7
Yes	31	22.3
Total	139	100
Where to get formal education on wetlands?		
School	17	63.0
College	5	18.5
Farmers	2	7.4
Dept. of Agriculture	1	3.7

Dept. of Environmental affairs	1	3.7
University	1	3.7
Total	27	100
Ever received any informal education about wetlands?		
No	111	79.3
Yes	28	20.0
Not sure	1	0.7
Total	140	100
Where informal education about wetlands was received?		
Elders/community members	16	61.5
On radio	3	11.5
Awareness campaign	2	7.7
Other farmers	2	7.7
Internet	1	3.9
Tribal authority	1	3.9
Workshop	1	3.9
Total	26	100
Ever tried to implement any education method to secure wetlands?		
No	139	99.3
Yes	1	0.7
Total	140	100

4.1.2.3 Wetlands presence awareness

The majority of household respondents 108 (73.6%) were aware of the presence of the wetlands while only 27 (19.3%) replied no to being aware (Table 4.7). This implies that only a minority of the community members were clueless about the presence of wetlands even though they lived nearby one.

Table 4.7: Awareness of the presence of wetlands in the area.

Are people in this area aware of the presence of wetlands?	Frequency	Count
Yes	103	73.6
No	27	19.3
Not sure	10	7.1
Total	140	100

4.1.2.4 Knowledge of wetlands management rules and regulations

According to the data presented below, majority of respondents appeared not to know anything about the wetland management framework and this is supported by the high percentage 131 (93.6%) who replied no to any knowledge about the management framework of the wetland (Table 4.8). Only 2 (1.4%) replied yes when asked about their knowledge on wetland management structures which make-up the lowest percentage. Seven respondents 7 (5.0%) appeared not to be sure about their knowledge on any management framework.

Table 4.8: Any knowledge of wetlands rules and regulations by the local communities.

Do you have any knowledge of wetlands rules and regulations?	Frequency	Percent
Yes	2	1.4
No	131	93.6
Not sure	7	5.0
Total	140	100

4.1.3 Respondents' perception on wetlands

The results below show different perceptions and attitude of the respondents towards the wetlands by looking into age, gender and education level.

4.1.3.1 Perception based on age

Table 4.9 gives the community's age-based responses/perceptions on wetlands in terms of awareness of their presence, receiving any formal education on wetlands and whether they generate income from them. The majority (more than 50%) of the respondents in all age groups (youth (86);, adults (42); and the elderly(12)) agreed that they were aware of the presence of wetlands in their areas. There was no statistically significant association between respondents awareness to the existence of wetlands by age ($p > 0.05$). A Chi-square test, as shown in Table 4.9, indicated a significant association between different age groups, receiving formal education and generating income from wetlands ($p < 0.05$). There were significantly more youths and adults who indicated having received formal education compared to the elderly. A significantly higher proportion of the elderly (75.0%) generated income by selling products from the wetlands compared to youths (16.3%) and adults (40.5%) and this association/relationship was deemed to be weak according to the Cramer's V test (Table 4.9).

Table 4.9: Age-based responses/perceptions on wetlands.

Responses	Proportion of respondents who agreed, count (%) (n=140)			Cramer's V	Significance
	Youth (n=86)	Adults (n=42)	Elderly (n=12)		
Awareness of the presence of wetlands	(61) 70.9 ^a	(32) 76.2 ^a	(10) 83.3 ^a	0.119 ⁰	n.s
Formal education about wetlands	(25) 29.4 ^a	(6) 14.3 ^{a,b}	(0) 0.0 ^b	0.232 ⁰	*
Income from wetlands resources	(14) 16.3 ^a	(17) 40.5 ^b	(9) 75.0 ^c	0.396 ¹	***

*= $P < 0.05$, **= $P < 0.01$, ***= $P < 0.001$, n.s. = $P > 0.05$; Proportions with similar superscripts are not statistically different from each other; ⁰ = no relationship to weak; ¹ = moderate relationship; ² = strong relationship; () = count and outside bracket is the percentage

4.1.3.2 Perception based on gender

Table 4.10 shows the community's gender-based responses/perceptions in terms of awareness of their presence, receiving any formal education on wetlands and whether they generate income from them. Generally, the majority were aware of the presence of wetlands in their area (Table 4.10). A Chi-square test, as shown in Table 4.10, indicated no significant association between gender on awareness of presence of wetlands, receiving any formal education on wetlands and whether they generate income from wetlands. The Chi-square test also showed no significant associations between gender and responses/perceptions in terms of awareness of presence of wetlands, receiving any formal education on wetlands and generating income from wetlands.

Table 4.10: Gender-based responses/perceptions on wetlands

Responses	Proportion of respondents who agreed, (count)% (n=140)		Cramer's V	Significance
	Male (n=52)	Female (n=88)		
Awareness of the presence of wetlands	(37) 71.2 ^a	(66) 75.0 ^a	0.080 ⁰	n.s
Formal education about wetlands	(9) 17.3 ^a	(22) 25.3 ^a	0.093 ⁰	n.s
Income from wetlands resources	(15) 28.8 ^a	(25) 28.4 ^a	0.005 ⁰	n.s

*= P < 0.05, **= P < 0.01, ***= P < 0.001, n.s P > 0.05; Proportions with similar superscripts are not statistically different from each other; ⁰= no relationship to weak; ¹= moderate relationship; ²= strong relationship; () = count and outside bracket is the percentage

4.1.3.3 Perception based on education

This section deals with the community's responses/perceptions in terms of awareness of presence of wetlands, receiving any formal education on wetlands and whether they generate income from wetlands, based on their educational status (Table 4.11). A Chi-square test showed significant associations based on educational status in all the three aspects (p < 0.05). A significant proportion of the respondents with tertiary education (85.9%) and with grade 8 to 12 (73.5%) were aware of

the presence of wetlands compared to those with grade 1-7 (43.5%) and with no formal education (50.0%). A similar observation was made when it comes to having received any formal education with more respondents having grade 8-12 and tertiary education having received formal education on wetlands and none of the respondents (0.0%) having had any formal education. As one would expect, a statistically significant proportion of those with no formal education and grade 1-7 derived some income from the wetlands (65.2% and 75.0% respectively) compared to those in the grade 8 to 12 (22.4%) and tertiary education (17.2%); indicating higher subsistence-level use of resources.

Table 4.11: Education level–based responses/perceptions on wetlands.

Responses	Proportion of respondents who agreed, (count)% (n=140)				Cramer's V	Significance
	Grade 1-7 (n=23)	Grade 8-12 (n=49)	Tertiary (n=64)	None (n=4)		
Awareness of the presence of wetlands	(10) 43.5 ^a	(36) 73.5 ^a	(55) 85.9 ^a	(2) 50.0 ^a	0.335 ¹	***
Formal education about wetlands	(0) 0.0 ^a	(12) 24.5 ^a	(19) 30.2 ^a	(0) 0.0 ^a	0.270 ⁰	*
Income from wetlands resources	(15) 65.2 ^a	(11) 22.4 ^a	(11) 17.2 ^a	(3) 75.0 ^a	0.417 ¹	***

*= $P < 0.05$, **= $P < 0.01$, ***= $P < 0.001$; Proportions with similar superscripts are not statistically different from each other; ⁰= no relationship to weak; ¹= moderate relationship; ²= strong relationship; () = count and outside bracket is the percentage

4.1.3.4 Respondents' attitude towards the wetlands

The variation of attitudes of the communities towards the wetlands ranged from being positive, negative and not sure (Table 4.12). The communities seemed to have positive attitudes towards the wetlands due to a recorded 84 (54.9%) compared to 56 (36.6%) with negative attitudes. Only a very low percent of 8.5% was recorded for those who were not sure about the attitude.

Table 4.12: Attitudes that communities had towards the wetlands.

Kind of Attitude this community have towards these wetlands	Frequency	Percent
Positive	84	54.9
Negative	56	36.6
Not sure	13	8.5
Total	153	100

4.1.4 Importance and utilization of wetland resources by the local communities

4.1.4.1 Importance of wetlands resources

When the respondents were asked if they have any understanding about the importance of natural resources, 120 (85.7%) replied yes while only 20 (14.3%) said no (Table 4.13). The results were spread-out amongst males and females.

Table 4.13: Shows the importance of natural resources as viewed by the communities.

Understanding about the importance of natural resources	Frequency	Percent
No	20	14.3
Yes	120	85.7
Total	140	100

4.1.4.2 Agricultural activities

From the responses provided by the participants and the researchers' observations, agricultural activities practiced in all study areas constituted a large percentage of activities practiced in the areas. When the respondents were asked if there are any agricultural activities practiced in the area 129 (92.1%) replied yes, while only 11 (7.9%) said no (Table 4.14).

Table 4.14: Agricultural activities practiced in the area.

Any agricultural activities community practice in the area?	Frequency	Percent
No	11	7.9
Yes	129	92.1
Total	140	100

4.1.4.3 Natural resources used by the community

Among other important services they received from the wetlands, the communities identified the main resources for domestic purposes, water for their plants, medicinal plants, firewood, wood, water for animals, and grazing lands for animals and reeds to make various products. According to the results, Figure 4.3 shows that water was the main resource the communities derived from the wetlands with the highest percentage (Figure 4.3). Medicinal plants were the second high percentage (23.4%) resources which the community get followed by wood for fire with a 13.2%. Reeds and wild vegetables constituted lower percentages of 8.1% and 1.7%, respectively.

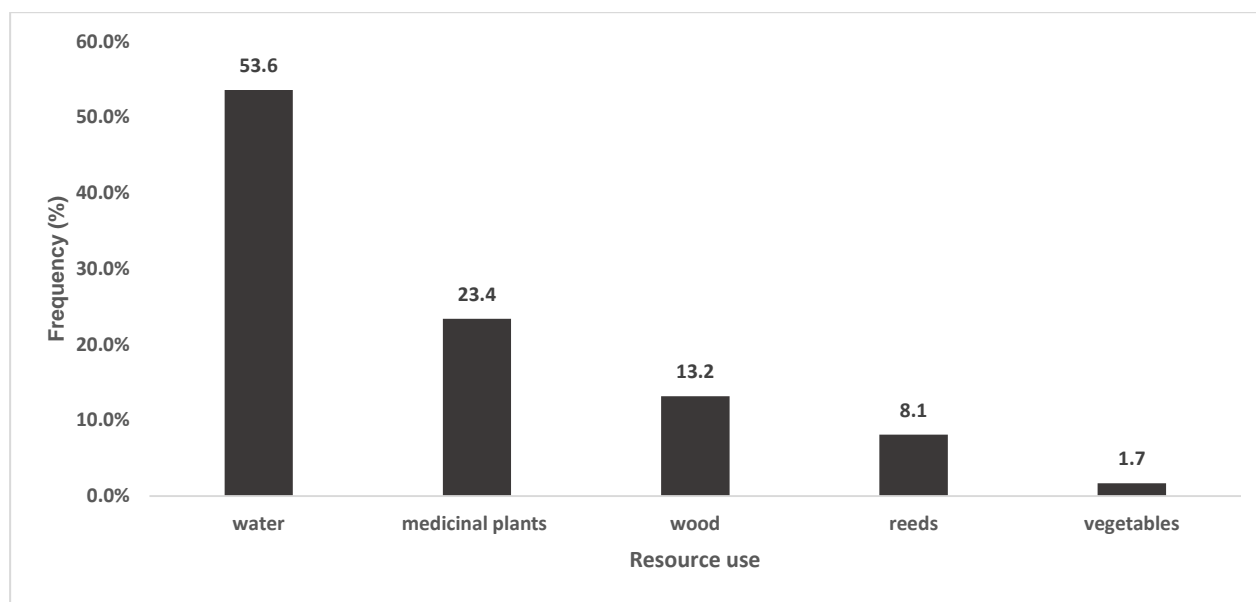


Figure 4.3: Resources available for use from these wetlands.

4.1.4.4 Agricultural activities

Findings of the survey indicated that agriculture was one of the main activities practiced on wetlands. Figure 4.4 shows that a high percentage (60.3%) of agricultural activity practiced was growing vegetables and crops, with maize, vegetables and fruit plants mentioned as the most grown plants/crops. Livestock rearing was the second highest agricultural activity (38.2%) and cattle and goats were mentioned as the most common livestock kept. Cutting reeds (1.0%) and fishing (0.5%) were the lowermost activities being practiced at the wetlands.

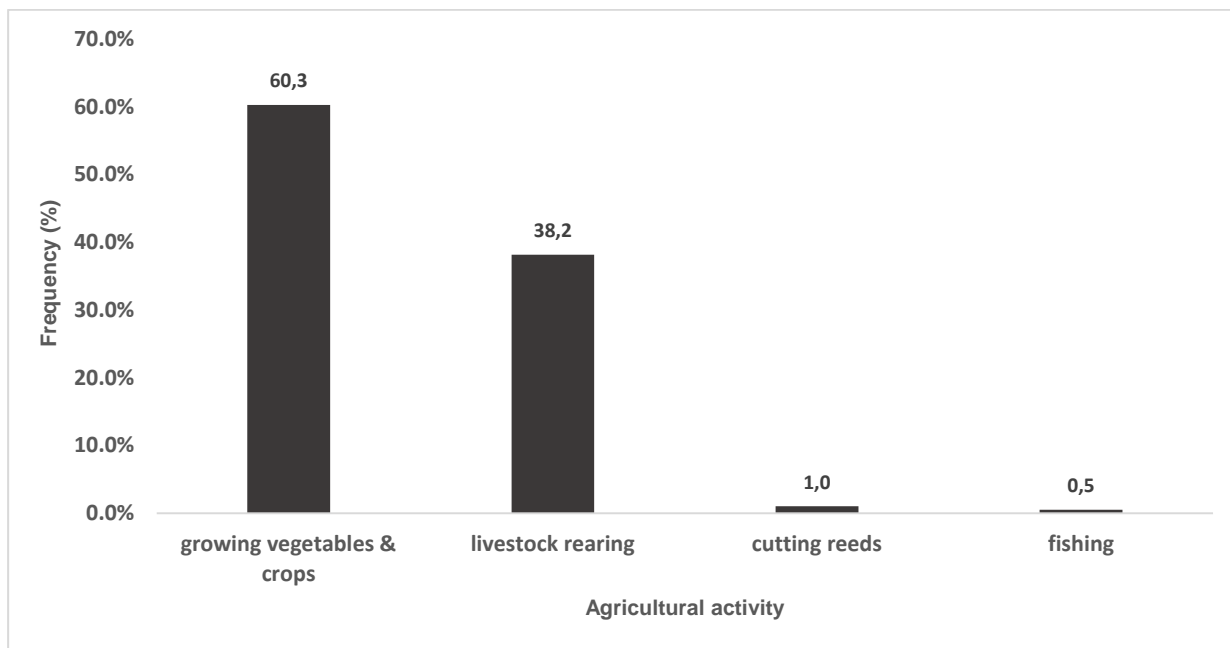


Figure 4.4: Agricultural activities practiced in the area.

4.1.4.5 Crops planted

Findings in Figure 4.5 indicate that maize was the most important plant grown on the wetlands by the communities due to its highest percentage (24.6%). Other commonly grown plants were cabbage (18.0%), tomatoes (12.8%), mutshaini (10.8%), spinach (8.9%), sugarcane (5.9%), sweet potatoes (4.6%), pepper (3.0%), ground nuts (2.0%), muxe (1.6%), onions (1.6%), potatoes

(1.0%), traditional vegetables (1.0%), butternut (0.7%), okra (0.7%), sorghum (0.7%), watermelon (0.7%), banana (0.3%), phuri (0.3%) and tea (0.3%).

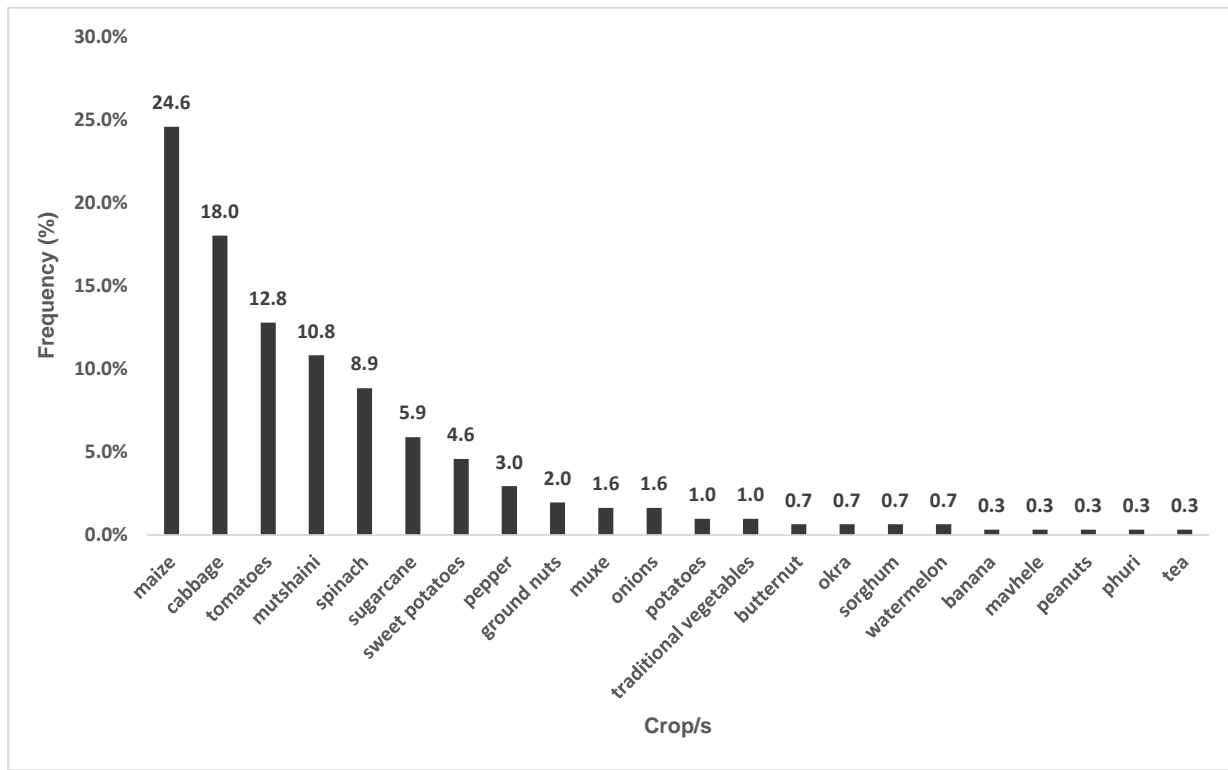


Figure 4.5: Common crops planted in the wetlands.

4.1.4.6 Common methods used for farming

When the respondents were asked about any methods used for farming on the wetlands, 45.0% mentioned using a hand hoe and farming by tractors (33.3%) as the most common methods (Figure 4.6). The most common additional farming methods were irrigation systems (12.7%), animal-drawn (8.5%) and water pumps (0.5%).

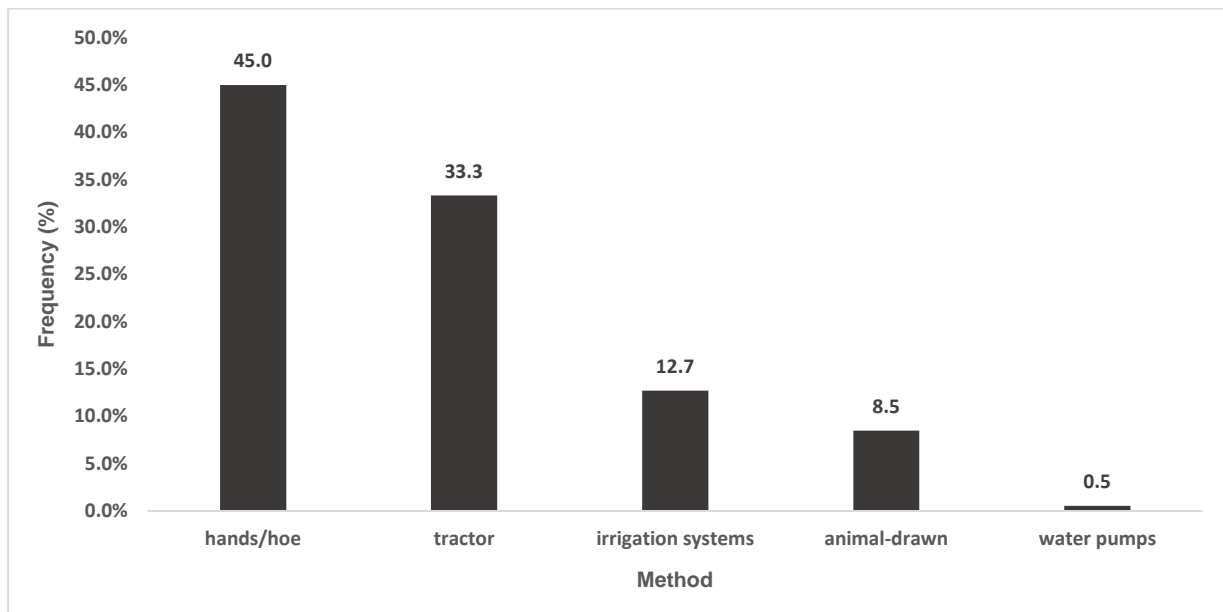


Figure 4.6: Methods commonly used for farming in the wetlands.

4.1.4.7 Communities' wetland use duration

The duration of wetland use by the households within the area was also taken into consideration. One of the main reasons was to support background information on the use of the wetland. The results revealed that 48.3% have been living within close proximity of the wetland for a long time and 28.3% only have a couple of years. Some respondents (20.0%) mentioned they don't use them, while only 3.3% were not sure about the duration (Table 4.15).

Table 4.15: Duration of using wetlands.

How long have you been using wetlands resources?	Frequency	Percent
A long time	58	48.3
Couple of years	34	28.3
Don't use them	24	20.0
Not sure	4	3.3
Total	120	100

4.1.4.8 Number of people working on the wetlands

Data in Table 4.16 below shows an estimated number of people working on each plot of land in the wetlands. The sample size was only 44 for the reason that questioned respondents were not sure about the number of people working on other plots of land at the wetlands. It is estimated that the minimum number of people was three in each plot of land while the maximum number was 35 (Table 4.16). The mean is 12.41 while the standard deviation of 8.345 suggests that the numbers were not evenly spread-out from minimum to maximum.

Table 4.16: Descriptive statistics for the number of people working in each plot of land in the wetlands

Sample size	Minimum	Maximum	Mean	Std. Deviation
44	3	35	12.41	8.345

4.1.5 Economic value the respondents derived from wetlands

4.1.5.1 Income generated from the wetlands

Respondents were asked if they generated income from any wetlands resources. The majority of the respondents, 100 (71.4%), replied that they received no income from the wetland's resources (Table 4.17). Only 40 (28.6%) reported to generating income from the wetland resources. The products are mainly sold to the respondents who do not generate income from the wetlands because they lived in the same community.

Table 4.17: Generate any income from wetlands resources.

Do you generate any income from wetlands resources?	Frequency	Percent
No	100	71.4
Yes	40	28.6
Total	140	100

4.1.5.2 Income generating activities

The respondents (28.6%) who generated income from resources (Table 4.17) did so mostly by selling agricultural products to the rest of the community. This is shown in Figure 4.7 where the most common income generating activity (82.9%) was selling agricultural products. The rest of the activities included collecting wood, fishing, harvesting medicinal plants and sedge to make mats, and selling bricks and reeds made up the remaining uses, each contributing 2.9% to income generated.

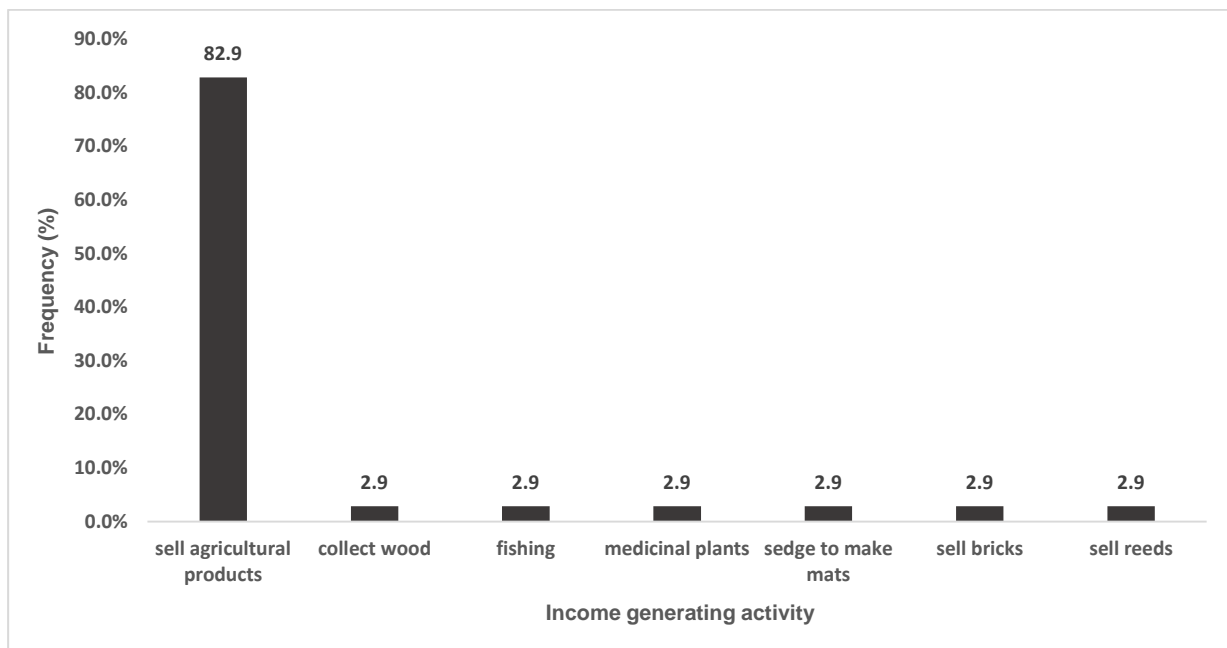


Figure 4.7: Income generating activities performed in the wetlands.

4.1.6 Local communities' strategies to protect wetlands

4.1.6.1 Strategies thought by the respondents to secure wetlands

Although 61.5% of the respondents indicated that they do not think of any strategy that can protect the wetlands, at least 12.6% mentioned educating people about the importance of wetlands for better security (Figure 4.8). Other respondents (5.9%) mentioned raising awareness, avoid

dumping waste (3.0%), create community conservation programmes (2.2%) and monitor the use of wetlands (2.2%). The rest of the strategies constituted very low percentage and these included: avoid burning (1.5%), cleaning-up the area (1.5%), fence around the wetland (1.5%), informing the people (1.5%), planting trees (1.5%), stop building near wetlands (1.5%), create committees (0.7%), limit resource harvesting (0.7%), outreach programmes (0.7%), reduce pollution (0.7%) and stop using the wetlands (0.7%).

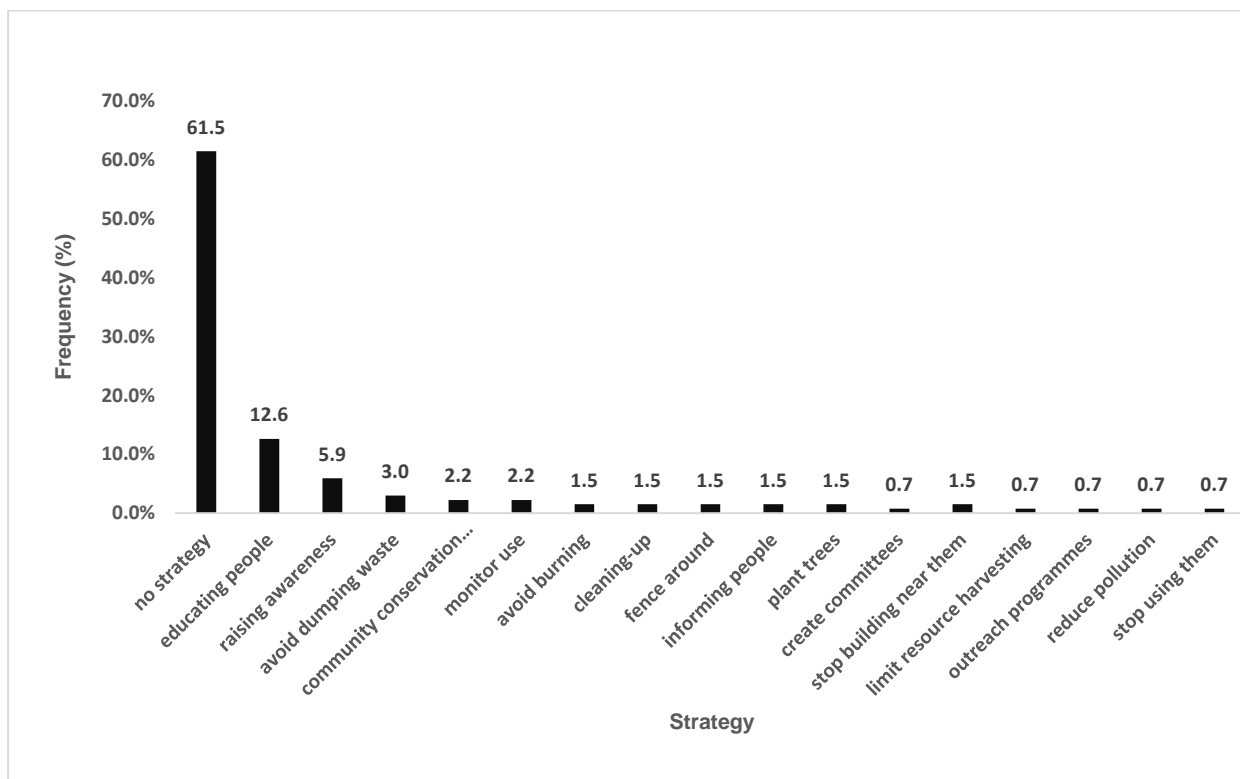


Figure 4.8: Strategies thought by the respondents to secure wetlands.

4.1.7 The conditions of the study wetlands

From the investigator's field observations, all wetlands were in poor state resulting mostly from unsustainable cultivation and overgrazing. However, one of the wetlands (Mbaleni) also evidently suffered from the development of houses.



Picture 4.1: Mbaleni wetland, showing agricultural activities and developments of houses.

4.2 Stakeholder analysis and wetlands management

The main institutions involved in the management, conservation and utilization of selected wetlands were identified from relevant policy documents and interviews.

4.2.1 Limpopo communal wetlands governance structure

Wetlands management processes are driven by several institutions which are brought together by the same objectives. These include local institutions (controlled by traditional leaders and wetland committees in other cases) and external institutions (such as local and national government agencies, and non-governmental agencies (NGOs) as shown in Figure 4.9. The system of participation by these different institutions is influenced by their diverse institutional mandates and priorities torn between socio-economic and environmental considerations. As the situation involves different partners operating in coalition, a collaborative approach for effective

management of these wetlands was practiced. The successive sections discuss the extent to which the coalition management was being achieved in these communal wetlands.

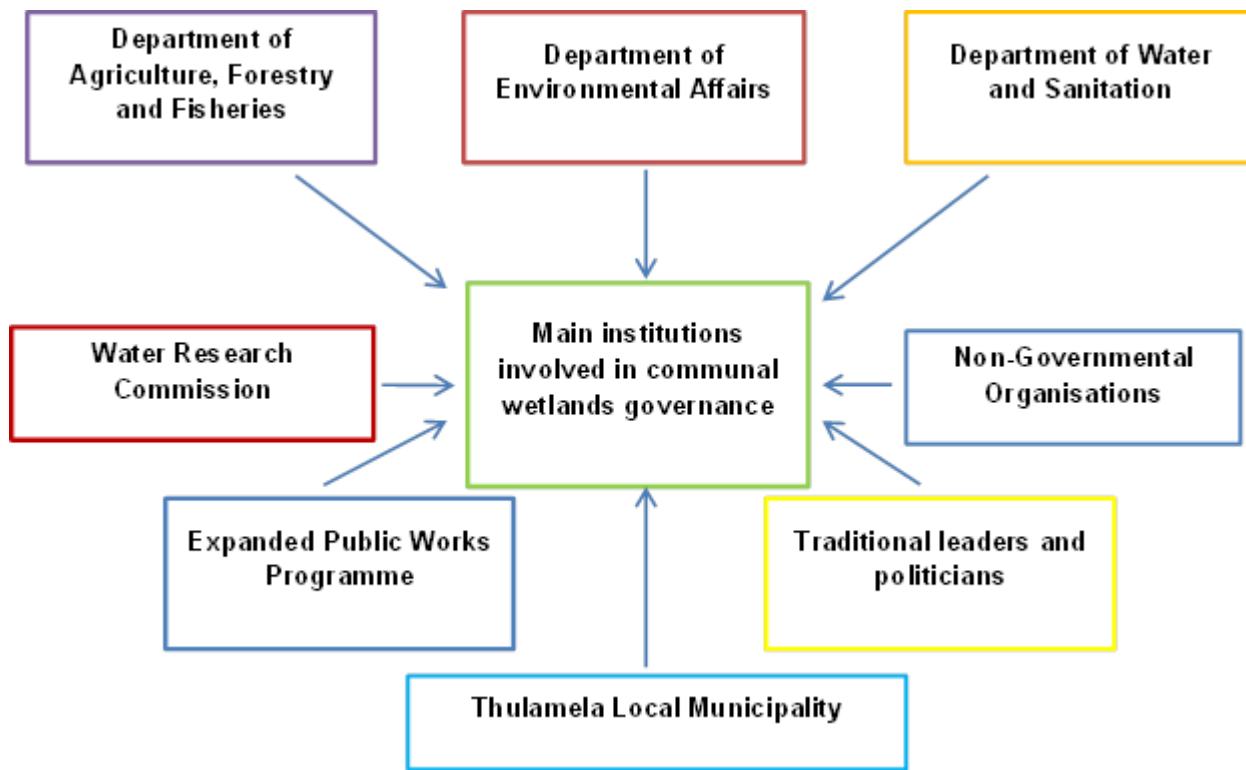


Figure 4.9: Institutions involved in communal wetlands governance.

4.2.2 The role of different institutions in wetland management and conservation

The government departments are the key stakeholders influencing policy direction on wetland management and conservation, although other institutions are invited to provide their input.

4.2.2.1 Thulamela Municipality wetland management strategies

South Africa is a rapidly urbanizing country with very high levels of poverty owing to a high proportion of low income residents, and lack of proper water and sanitation infrastructure. There is also a relatively high reliance on ecosystem services and this contributes to exploitation and

degradation of natural resources which negatively impact on communities' well-being. Therefore, it is part of the municipality mandate that it has an environmental section that strives to protect natural resources and these include wetlands, thus enabling the supply of ecosystem services to the local communities sustainably and promoting resilient communities within the changing climate. The municipality also has the aim to improve knowledge and understanding of wetland values. There are ranges of priority focal areas that should be considered in the management arrangements and structures of wetlands. The focal areas are broadly arranged into five themes as indicated in Figure 4.10.

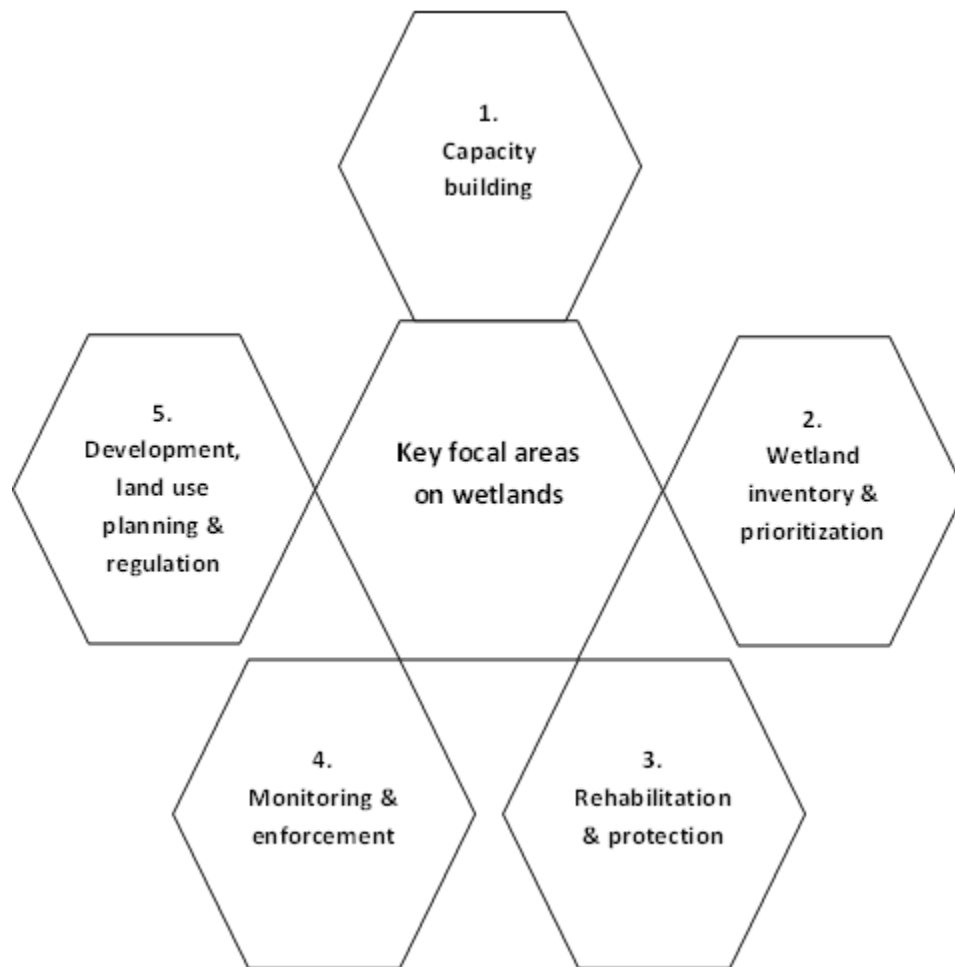


Figure 4.10: Focal areas that need to be considered when developing an action plan for wetland management.

Below are the strategic action plans for the wetlands by the local municipality (Table 4.18). For improved management, these focal areas should always be used as a reference point when developing local wetland strategy and action plans. Each focal point has different strategic action plans broken down into sections to all be considered in management decision making.

Table 4.18: Initiatives and strategies to be considered in the formulation of wetland management action plan.

Mainstreaming Initiative	Strategic action
1. Capacity building	<ul style="list-style-type: none"> Establish an environmental section with qualified environmental scientists and key personnel to address wetland management and broader sustainable development imperatives. Actively engage with the broader wetland fraternity through Provincial Wetland Forums and South African Wetland Society Create broader awareness for wetland management through communication, education and public awareness initiatives Actively engage with key sectors, developers and land owners in municipality that are having, or stand to have, significant impacts on wetlands.
2. Wetland inventory and prioritization	<ul style="list-style-type: none"> Establish a sufficiently detailed and scientifically defensible baseline wetland inventory Prioritize wetlands to further inform conservation and management priorities and guide rehabilitation efforts.

3. Rehabilitation and protection	<ul style="list-style-type: none"> ▪ Develop and implement rehabilitation plans for priority wetlands. ▪ Seek formal protection of priority wetlands through appropriate legal mechanisms. ▪ Initiate and/or support biodiversity stewardship projects that seek to protect and manage natural assets, including wetlands. ▪ Seek complimentary support from other governmental departments, agencies, non-profit organization, and community groups which are contributing to wetland management goals. ▪ Consider the use of economic instruments like rates rebates, special taxes, fines/penalties, permits and other incentives to promote the protection and management of priority wetlands.
4. Monitoring and enforcement	<ul style="list-style-type: none"> ▪ Establish an environmental compliance and enforcement function and system for the municipality. ▪ Develop and implement a priority wetland ecological monitoring programme for the municipality. ▪ Involve communities, community groups and the public at large in monitoring efforts of environmental resources.
5. Development and land use planning and regulation	<ul style="list-style-type: none"> ▪ Identify strategic projects and programmes that support or contribute to improved wetland management ▪ Integrate wetland best management practices and wetland priorities into municipal-scale sectoral plans ▪ Identify local CMAs and catchment management forums as part of WMA water resource management

4.2.2.2 Frequency of institutions participation in wetland use and management

Traditional leaders are more visible in both wetland use and management as they work with local people more than DEA, DAFF, DWS, TLM and NGOs (Figure 4.9). The high participation frequency of traditional leaders is influenced by the fact that they live within the communities and close to the wetlands. The other institutions are more reactive in wetland management decision making than daily routines which result in its low frequency of visits. The decision makers occasionally respond to wetland degradation threats such as fire and illegal developments instead

of routine management of the resource. The involvement from other institutions such as Department of Basic Education (DBA), Department of Correctional Services (DCS), Limpopo Economic Development, Environment and Tourism (LEDET) and the University of Venda is negligible to none. Therefore, most local and national government institutions remain largely unknown because of low participation. Poor participation from government departments has also been identified as a common problem in Ethiopia (Dixon et. al, 2013). However, key informant interviews revealed that the proper functioning of government departments is mostly constrained by inadequate human capacity and financial resources resulting in their ad hoc visits.

The participation of political leaders and NGOs is restricted to certain tasks (Table 19). It was also noted that councilors effectively participate in the conservation of wetlands which they reside closer to and have access to benefits. This may explain why they are largely known in most wetlands. Overall, the frequency of participation in these communal wetland management and conservation was poor and consequently implied that the number of visits by institutions was a significant determinant of the local people's willingness to participate in wetland conservation. This may show that there is a need for local institutions to adjust their objectives and take a leading role for the improvement of wetland management.

4.2.2.3 Overall central institutions responsible for selected wetlands

Key institution's interests/ or responsibilities have been identified as resource management and utilization; policy development and implementation; land ownership and protection; financial implications, social responsibility and education (Table 4.19). Based on the collected data, government institutions and associated programmes which take more responsibilities in conservation and management of wetlands include DEA, DAFF, and TLM (Table 4.19). Besides

other obligations, their responsibilities range from policy development; resource management; financial needs and social responsibilities concerning wetlands. While other institutions such as DWS, DEAC, LEDET mostly get involved in social responsibilities (Table 4.19). Every referred organization has an education and social responsibility element in their interest. Thulamela Local Municipality and traditional Tribal Authorities are the only institutions with more interest in land ownership and protection (Table 4.19). The questionnaires directed to the traditional council revealed that the councils were involved in more ways than one with the exception of policy development and implementation and financial responsibilities.

Table 4.19: Key institutions and their main interests/ responsibilities.

	Key responsibility				
	Resource management & utilisation	Policy development & implementation	Land ownership & protection	Financial Implications	Social responsibility and education
Government and associated programmes					
The Department of Environmental Affairs and (DEA)	X	X		X	X
Department of Water and Sanitation(DWS)		X			X
Department of Agriculture, Forestry and Fisheries (DAFF)	X	X		X	X
Department of Education, Arts and Culture (DEAC)					X
Limpopo Economic Development, Environment and Tourism (LEDET)					X
Working for Wetlands (WfWet)	X	X		X	X
Thulamela Local Municipality (TLM)			X	X	X
Non-Governmental Organisations & Community Based Organisations					

Village committees					X
Tribal Authorities & Traditional Councils	X		X		X
University of Venda (Univen)					X

4.2.2.4 Key institutions' further roles and responsibilities

Further roles and responsibilities from the key institutions are planning, influence, support, management and capacity (Table 4.20). Only five institutions are involved in the planning aspects of the wetlands. Three respondents (from TLM, DEA and DAFF) indicated that their roles were related to planning i.e. to identify degradation problems in areas within their jurisdiction and to develop a rehabilitation plan. According to the respondent from the DAFF, the institution has been playing a major role in planning the workshops for training of community leaders. As shown below (Table 4.20), all institutions provided several categories of support including financial support, support by attending events, and support by providing services. Only DEA and Tribal Authorities stood out as being very influential due to their catalytic action of lobbying and mobilizing the community (Table 4.20).

Table 4.20: Functions of stakeholders.

	Key responsibility				
	Planning	Influence	Support	Management	Capacity
Government and associated programmes					
The Department of Environmental Affairs and (DEA)	X	X	X	X	
Department of Water and Sanitation(DWS)			X		X
Department of Agriculture, Forestry and Fisheries (DAFF)	X		X	X	X
Department of Education, Arts and Culture (DEAC)			X		X
Limpopo Economic Development, Environment and Tourism (LEDET)	X		X	X	X

Working for Wetlands (WfWet)	X	X	X		X
Thulamela Local Municipality (TLM)	X		X	X	X
Non-Governmental Organisations & Community Based Organisations					
Village committees			X		X
Tribal Authorities & Traditional Councils		X	X	X	X
University of Venda (Univen)			X		

i. Planning

Table 4.20 shows that five institutions were involved in the planning aspects of the wetland's conservation and management. Three interviewed institution representatives (TLM, DAFF and DEA) indicated that their roles were related to planning, i.e. to identify problem areas within the wetlands that need to be rehabilitated and to develop a rehabilitation plan.

ii. Influence

The Department of Environmental affairs (through WfWet) stood out as being very influential institutions due to their catalytic action of lobbying and mobilising other management stakeholders. Tribal authorities on the other hand, are known for their ability to positively persuade their communities.

iii. Support

All cited institutions present several categories of support including financial support, support by attending events, and support by providing services.

iv. Management

The study identified that the DAFF, DEA and TLM played overall wetlands project management roles while they also included affected tribal authorities where needed.

v. Capacity

The NGOs have more human capacity to assist in implementing the project's programmes, whereas the governmental institutions serve more as a source of finance and decision making.

CHAPTER 5: DISCUSSION

5.0 Chapter overview

The study was set to ascertain challenges affecting the management of Thulamela wetlands focusing on the communities' needs and wetland governance. Based on the results, the study aimed to outline the challenges and propose measures to improve the symbiosis between the communities' needs and viable management of those wetlands. This chapter presents the discussion of the results outlined in Chapter 4.

5.1 Importance of wetlands resources to the local communities

The results of the study showed that selected wetlands were highly beneficial in supporting the local communities. As indicated by the respondents, these wetlands provided a variety of livelihood benefits such as crop farming, water, livestock grazing, sedge and grass harvesting. Despite the benefits they provide, there were several factors threatening wetlands ecosystem health. Coinciding with Barbier et al. (1997) and Schuyt (2005), the findings indicated that human activities were the largest threats for the wetland's sustainability. These human-induced pressures, including exploitation of resources, cultivation and wetland encroachment, indicated potential resource use issues arising from different interests and views on the management of wetlands. The findings showed the principal threat to wetlands was the lack of awareness of wetlands' fragile nature and their benefits resulting in uncontrolled cultivation, overgrazing and building on the wetland. The results revealed that crop production was the most common agricultural activities the communities practiced on the wetlands with the high percentage of 60.30% followed by livestock rearing of 38.19%, giving a total of 98.49% (Figure 4.4).

5.2 Socio-economic and demographics

Based on the socio-economic and demographic characteristics (family size, age, gender, and employment status) measured, the study deduced that the unemployment rate or low income of the respondents was the main contributor to the high dependency on wetland utilization. This was due to the fact that the majority of respondents who utilised the wetlands were unemployed with lower household expenditures. The respondents indicated that their main reason for wetland utilization was to resolve some of the socio-economic problems such as shortage of subsistence food and generate income for other expenses. Differing from observations by Rebelo et al. (2010) in Tanzania, in times of food scarcity, wetlands are used as a coping strategy; the findings from this study show that wetlands resources are an indispensable part of community's livelihoods. The finding of this study is in pursuant with Turyahabwe (2013) who observed that in Uganda, wetlands are the source of household food security. In agreement with Lamsal et al. (2015), socio-economic factors such as larger household size and older age of the household heads increased the rate of wetland resource extraction. Some socio-economic studies have shown the existence of gender differences in utilization of wetland resources (Adede, 2009). Even though more respondents were females than males, the findings did not elucidate on the gender that used wetlands resources than the other. However, the results showed that wetland users were of middle age to elders rather than the youth of 30 years and below.

5.3 Educational level and awareness of the wetlands presence in the area

Results of the study showed that education significantly influenced the respondents' awareness and perceptions of the wetlands, similar to findings by Raburu et al. (2012). Furthermore, the results showed that the local communities were aware of the presence of the wetlands (Table 4.7). However, most respondents did not understand the fragile nature of these wetlands and the need to

practice sustainable use. The study found similar findings to Turyahabwe et al. (2017), further suggesting that educated respondents were more likely to comprehend wetlands information more easily than those not educated. Additionally, the respondents who had formal education on wetlands might have had wetlands policies and legislation as part of the education system curriculum. Consequently, educated people may consciously sustain interest in matters related to wetlands at other stages of their lives.

The main source of informal education about wetlands received by of the respondents was the elders of the communities (61.5%) and the radio (11.5%). The advantage of radio is that it can transfer more information from one source to masses in a wide geographical area at a relatively affordable cost compared to other methods such as meetings. However, the information transferred through the radio is limited compared to physical engagements. The elders from the communities are easily accessible to transfer the indigenous knowledge. Hence, more respondents received informal education from the elders. In addition, communication of information on wetlands is simple through community leaders possibly because they are in touch with the people by virtue of being members of the communities in which they lead. Moreover, community leaders also act as a link between institutions concerned with wetland conservation and management and have better opportunities to access information through training that they can later deliver to their people.

The results also indicated that only small proportions (1.4%) of the sampled households were aware of the informal or traditional rules and regulations in using the wetlands while maintaining its integrity. This might be attributed to wetlands management strategies that are driven by top-down administrative procedures and emphasizes formal rules and regulations, consequently weakening traditional rules and regulations. Insufficient or lack of awareness about wetlands

management requirements may be attributed to the fact that relevant programmes are not reaching the communities. Consequently, this deprives them of the knowledge that can mostly contribute in the improved management of these wetlands. The study recognised that there was an urgent need for educating and training the local communities on the management of wetlands. Furthermore, for improved awareness, legal provisions should be in a simplified format comprehensible by local people of various ages. Various stakeholder groups showed many areas of common understanding and consensus in the wetland system. However, as described in this study, there were several opposing interests and perceptions between stakeholder groups.

5.4 Respondents' attitudes and perceptions towards the wetlands

The findings portrayed some opposing interest amongst stakeholders. Management stakeholders had a relatively strong focus on livelihoods and environmental problems. Additionally, they regarded rules and regulations on wetland use as a relatively central variable. The respondents who benefited from the wetlands (such as farmers) had more positive perceptions than wetland non-users. Wetlands non-users showed alternative perceptions because their livelihoods are less likely to be impacted by any changes occurring in the wetland and they placed a higher focus on negative impacts arising from the wetlands. This difference in perceptions amongst stakeholder groups regarding the management of wetland contributed to the increasing degradation of these wetlands due to excessive use and sense of ownership. The differing opinions between wetland stakeholders and those who have no stake in the wetlands may also apply to the degradation of In agreement with Turyahabwe et al. (2017), this study showed that most wetland users perceived sustainable livelihood and management of these systems as legal barriers to local development. Corresponding to findings by Bikangaga et al. (2007) and Wood (2003), the local communities perceived wetlands as important openly accessible systems that provided free products for the poor locals.

5.5 Present condition of the selected wetlands

In agreement with Nephawe (2017), one of the findings from the observations was the destruction of wetlands through expansion of human settlements. The population increase in the areas was found to be major drivers of socio-economic challenges causing people to spread into and exploit wetlands. In line with Nephawe (2017), human settlements along the wetland areas resulted in the extensive clearance of natural wetland vegetation. The observed reason behind human expansion towards the wetlands was insufficient settlement space outside the wetland. During the field survey, it was observed that some part of the wetlands were drained for the purpose of irrigating planted crops.

In addition, there was minimal education related to wetland importance to the local communities through awareness and outreach programmes. This involves relevant institutions conducting outreach programmes directly to the communities, awareness at neighbouring schools and any form of campaigns. The mentioned exercises were not done sufficiently and a more coordinated awareness strategies need to be developed. The responsibility lies with both the communities and relevant managerial institutions to promote and improve awareness of wetland management.

5.6 Strategies thought by the respondents to secure wetlands

The results also revealed that some local people did realise the benefits of conserving wetlands, hence they thought of strategies for their protection. However, despite recognizing the benefits, there were potentially conflicting interests, such as the interests of the users and wetland managers. Conflicting interests appeared to be the main source of much tension and controversy in current wetland management and conservation strategies. Although natural resources policies attempt to

reconcile some of the differences, there might have to be some modification to achieve amicable decisions.

5.7 The role of different institutions in wetland management and conservation

Similar to findings by Marambanyika and Beckedahl (2017), poor communication amongst government institutions and wetland users poses a large threat to the sustainable management of wetland resources. The results showed that the majority of local communities did not even know where to get education about the wetlands besides school (Table 4.6) and also did not have a forthright and easily approachable platform to address their own issues relating to wetlands. Some important issues had been raised by members of the local communities but most of them seemed to evaporate before reaching pertinent decision makers. This might be due to inconsistency and little commitment by government in engaging with the local communities.

The local community on its own does not have the required resources and relevant skills to manage the wetlands. However, co-management by all parties is viable but there appeared to be a gross failure in integrated management by all institutions. This might be due to the lack of trust and confidence amongst parties. Government institutions should take charge in bringing together all concerned and plan together with the community groups at how to implement the co-management plan. Essentially, the government institutions are the custodians of the wetlands (DWS in the absence of a CMA and DEA for managing land use and impacts). They should provide the necessary support (education and financial) for local communities to monitor and manage the wetlands themselves; i.e. local communities and government need to meet halfway to start off with but then the local stakeholders should take ownership (only bringing in government when needed). The results indicate that there were no effective management plans for these

selected wetlands. This was supported by data collected from local communities and the researcher's direct observations where the wetlands were being used without borders. In order to restore the wetland's ecological integrity, an integrated approach has to be undertaken. More delays in developing a plan, the wetlands will further be degraded resulting in them losing their function.

According to Trisurat (2006), management approaches need to be acknowledged as an approach driven by a desire to resolve apparent problems within the community, such as local conflict over wetland use. Most participants appeared to be interested in the study and provided valuable information; although, some of the community members thought the research was against them using the wetlands and wouldn't bring any assistance to them. This further confirms that the local communities were mostly concerned with their access to wetland resources as opposed to sustainable use.

5.8 Involvement of the community in decision making

In congruence with Chirenje et al. (2013), the findings indicate that the local communities were not included in policy formulation and decision making about matters that concerned them. This can be confirmed through the responses from the communities where 94% stated that they knew nothing of the wetland rules and regulations. This suggests a lack of consultation and involvement of the community in decision-making, which is burying the communities' voices in matters that concern them. Results further indicate that the communities' futures are being planned for rather than planned with, which disempowers them socially. According to Chapter 16 of the Municipal Systems Act (2000), a municipality must develop a culture of community participation. It further elaborates that a municipality must develop a culture of municipal governance that complements

formal representative government with a system of participatory governance. Therefore, the municipality must encourage and create conditions for the local community to participate in the affairs of the municipality.

5.9 Policy implementation

The results indicated that the knowledge and implementation of policies for the communities was not taken as a priority by managerial institutions. The only time the community was made aware of the policies and regulations, was when government or other environmental organizations (such as DEA, DWS and DAFF) convened workshops on policies. These workshops were mostly initiated by the concerned organizations when it suited their schedules. The workshops were convened on an *ad hoc* basis. The study indicates that the workshops did not add any value to the community because they were not ‘diluted’ enough for easy comprehension. Similar to observations by Turyahabwe et al. (2017), the activities by local communities appeared to be more concerned with their development issues rather than the management of wetlands. However, this might be a good start as it could train and grow the communities. This is vital for focusing on building local level community management institutions, which on behalf of local people can manage the wetland sustainably. The study established that the local communities would be more interested in wetland conservation if they learned that it will aid to them receiving continuous benefits.

5.10 Challenges affecting wetland management under current institutional arrangement

The lack of co-ordination and dominance of some institutions was the major bottleneck to the current institutional structure efforts (Marambanyika and Beckedahl, 2017). This was due to the fact that absence of a clear institutional framework acted as a hindrance to effective wetland

management. The indistinctness was confirmed by 93.6% respondents who did not know anything about management plans of wetlands. A number of interviewees highlighted some case where community-based organizations such as traditional authorities identified themselves as the only entity with the sole mandate to manage wetlands due to claims on land ownership, which resulted in the lack of acknowledgment of efforts by other institutions. Wetland users often comply with strategies that allow them to engage in their usual activities such as cultivation giving them direct benefits regardless of their effect on wetland integrity. This may explain why traditional leaders and wetland committees are more accepted by local communities than government institutions with obligations to prohibit wetland draining for cultivation.

The current wetland management institutional arrangement is also affected by confusion originating from differences from poorly defined mandates and other institutional dimensions. Thus, politicization of wetland use and management, especially by councillors, was another concern as it undermined the efforts of government institutions such as TLM, DEA, and DAFF. According to the interviewees, at times, the disagreements were started by politicians during meetings about wetland management in various areas. Moreover, the political leaders' participation in most cases was driven by political ambitions rather than the need to conserve the wetland, a situation also observed in Nigeria by Adekola et al. (2012). Therefore, political interests took precedence ahead of wetland conservation. The findings suggest that an approach comprising of locally devised and tailored governance mechanisms within the national regulatory frameworks could contribute to improved wetland management. Thus, an approach combining both top-down and bottom-up approaches may be more appropriate for sustainable wetland management that meets local communities needs and maintains a functioning ecosystem.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The purpose of this study was to examine any challenges that might be affecting the management of Thulamela wetlands by looking at the managers' engagement with the local communities and their use of wetlands. Mixed methods (questionnaires, interviews and observations) were used for the investigation. The study highlighted that wetlands play a major role in providing different resources to the local communities. By using questionnaires, current utilization of wetland resources by the majority of the local communities were examined and common benefits the local communities derive from the wetlands are crop production, water, livestock rearing and natural resource harvesting. However, few respondents indicated that they were generating on generating any income from the use of wetland resources, denoting that most households were using the resources only to support their families; i.e. for subsistence use only. Conforming to Lamsal (2015) and Turyahabwe (2013), local communities who directly used the wetland resources were of the average age to elders (35 and above) while most of the respondents below the age of 35 were educated and did not directly acquire benefits from the wetlands. Conforming to Nephawe (2017), the research found that the majority of the respondents directly acquiring resources from the wetlands were unemployed and/or earned low incomes which influenced wetland exploitation. Additionally, lack of knowledge on wetland legislation was found to be one of the contributing factors conflicting with wetland management processes.

Perceptions play a vital role in the management of wetlands. In agreement with Bosma et al. (2017), management stakeholders of the current study areas had positive perceptions on wetland conservation and management including livelihood. While the local communities' perceptions

suggest that an increase in wetland cultivation had considerable positive impacts on livelihoods, without any consideration of the state of wetland area. This conflicting interest deserves particular attention by decision makers because it is likely to threaten the future sustainability of the wetland. According to Hardin (1968), if the benefit to the individual, even at a cost to the community, exceeds the cost to themselves then they are more likely to exploit that resource. Measures need to be put in place to increase the perceived cost to develop temperance. By probing stakeholders' perceptions, this study was able to determine that development of shared wetland management understanding benefits from a bottom-up approach (decision-making process that gives all stakeholders a voice). In similar view with Bosma (2017), the study suggests that, for a preferred management approach to sustainable wetland utilisation, a nested approach that incorporates the bottom-up approaches within top-down (higher authority determine goals) regulatory frameworks and an increasing awareness and knowledge on the ecological values of the wetland is fundamental.

The study also concludes that, several institutions are playing a bigger role in influencing wetland utilization and management by local communities. This includes government departments, non-governmental organizations, wetland committees and tribal authorities (traditional leaders). Although there is variation in the level of participation and existing relations amongst institutions from each wetland site, tribal authorities were involved in wetland activities in different areas.

The success of wetland management activities mainly depended on the level of participation by these local institutions and the local communities. Even though the degree of participation by different institutions varies, roles and mandates should be clearly defined for the purpose of minimizing discord and conflicts amongst institutions which sometimes result in wetland

degradation. It is argued that a wetland management multi-sectoral approach is imperative and inevitable, hence the need for establishing a sound institutional structure involving local people and interested institutions. If sustainable wetland utilisation is to be achieved, the sound institutional structure should include clearly defined roles and synergies. Local institutions led by traditional leaders and any other local committees involved in wetland management should be placed at the center of institutional framework given their proximity to users and the resources. Incorporating local institutions at the center of wetland management system may provide a low-cost option to the management of wetlands to the benefit of a resource-constrained country like South Africa. This is given by their proximity to both wetlands and their users and the fact that the performance of government institutions is mostly incapacitated by limited financial and human resources. Nevertheless, tribal authorities and government institutions should play advisory and managerial roles to ensure that the sustainable wetland management principles are complied with at local level as delineated under the standardised regulations.

It is also concluded that poor implementation of wetland law and inadequate awareness result in the adoption of wetlands degradation practices such as unsustainable agricultural activities and overharvesting. A range of institutional and socio-economic challenges elucidated the current knowledge and level of implementation of the current wetland law. However, in terms of scope and thrust, wetlands are currently being used and managed through the local strategies. With different levels of success, municipal bylaws assist in management and conservation of wetlands. Nonetheless, the wetland policy should assist in promoting the adoption of relevant local rules and regulations. In addition, the policy should encourage local rules' monitoring, documentation, regulations and also ensure continuous compliance regarding sustainable wetland utilization. In order to effectively educate and supervise communities' observance towards the relevant

framework, there is a great need to mobilize revenue and resources for empowering regulatory institutions. However, given the prevalent economic challenges in South Africa with limited operational funds, it might be prudent to recruit voluntary wetland monitors at local level. This could be achieved through implementing citizen science to monitor the health of the systems.

This chapter revealed and emphasised that there is little awareness and poor implementation of wetland-related laws. In agreement with Marambanyika (2015), the study also revealed that poor knowledge of wetland-related policies and laws were consequentially the result of insufficient awareness programmes for the wetland users. Additionally, the implementation of wetland management regulation is mainly undermined by high prevalence of poverty, inadequate financial resources and human capacity, political interference and possibly poor coordination of non-compliance cases.

Some of the respondents were interested to learn more about the wetland and were concerned enough to provide suggestions on how the wetland could be protected. Educating the communities about the regulations aimed at safeguarding wetland ecosystems by promoting wise use might certainly be a move to improve wetland management in the future. This shows that despite lack of relevant knowledge, some local people are conscious of the need to conserve wetlands for local benefits. Overall conclusions drawn from this study:

- Despite all the legislations, policies, and programmes, the protection of wetlands will only remain a vision if the regulations are not enforced. This could possibly be due to weak networks for information flow to end users. Perhaps the best way for improved wetlands protection is to educate the public of their benefits and potential dangers of losing them. If the public does not realize the potential consequences of wetlands loss, wetlands will not be conserved. However, protection can only be accomplished through the cooperative efforts of

the public. Having a local-interest group would certainly help in co-ordinating co-operative efforts.

- Conforming to Chirenje et al. (2013), complete involvement of all stakeholders including the local communities in policy networks is supposed to increase the satisfaction in the process which makes it more likely that they will comply with the rules. Hardin's (1968) said it is important to educate people first, so that they are aware of the issues. If they still continue to degrade the wetlands, then this is negligence and more stringent enforcement is needed (e.g. fines). This can avoid possibilities of misunderstand the regulations and also create the platform to advise on any potential implementation problems.
- The findings on the low level awareness of wetland rules and regulations might be due to the fact that users consider wetlands as a source of livelihood, and less about its management and conservation. Particularly because poor local communities have few or no reasons to support strict wetland rules and regulations. In line with Ostrom (1990), the study revealed that the local communities' major concern was a source of livelihood and not the management and conservation of communal wetlands that cannot exclude other communities from obtaining benefits from it. To some extent, this points out to the same observation by Mukasa (2011) that much has not been done to sensitise the public about the implementation of wetland policy and regulations by responsible authorities. The local communities currently regard wetland regulation requirements as legal barriers to local development. Hence, wetland users and their local leaders pay more attention in facilitating local economic development by supporting less stringent wetland regulation.
- Finally, without viable alternative livelihood options, local communities may claim ignorance of any wetland rules and regulations that they do not agree with, a situation which may mask reality.

6.2 Recommendations

This research has presented and highlighted challenges that affect the management of Thulamela wetlands, focusing on the managerial institutions and the local communities as wetland users. This information will provide insights to wetland researchers, managerial institutions and environmentalists. This might work towards an integrated approach to wetland management and also facilitate effective a currently lacking sustainable utilization of wetlands.

negligible

The findings of this study have therefore provided baseline information that can be considered in devising wetland resources management frameworks based on an understanding of socio-economic processes. This has overall enabled the following recommendations for future research and formulating management solutions:

- Wetland research should concentrate on long term monitoring of land-use and management strategies (not only on bigger and well recognised wetlands but also rural wetlands) of different sizes in order to build datasets and frameworks to assist in wetland management. Clear thresholds of potential concern would need to be developed, or drawn from similar studies, that would form the basis of the monitoring.
- The continued dominance and excessive cultivation in rural wetlands and its importance to local communities' food security also calls for further research in order to develop suitable methods that will promote sustainable cultivation in wetlands. There is also need for research on the effects of crop pesticides and herbicides used by local communities on wetland plants. Additionally, certification of organic farming on wetlands has the potential to aid in sustainable cultivation.

- Communication and information transfer are critical in any situation that requires participation by multi-stakeholders. Proper communication also involves consultations rather than information command and seeking advice rather than frequently forcing instructions.
- It is recommended that a flexible strategy of development be designed by all relevant stakeholders and incorporate clear rules and regulations that recognize the local socio-economic context.
- The local communities' views and principles should be the main motivation of participatory activities. This might consequently encourage participation by local people and a sense of initiative ownership. Furthermore, management guidelines should incorporate traditional values and practices, relevant local rules and regulations. Participation by local communities should be seen as an exercise stimulated by their own thinking and which they have some control over.
- Another way to encourage local community participation might be through project outputs reflecting inclusiveness by featuring local people in publications and awareness materials to illustrate their involvement. In addition, participatory approaches require changes in attitudes and simple interpretation of policies and development of a spirit of embracing each other's differences.
- To avoid imposed policy situation, all relevant role players (government institutions, NGOs, funders, consultant and local communities) should be allowed to make suggestions, possible alterations and appropriate changes to those policies. This might avoid any future challenges and disputes.
- Educational awareness programmes and information sharing can enhance the participation process, mobilize prior and new knowledge, build competence, and increase the overall output of the project. Therefore, it is recommended that educational processes be run and all

role players should participate (to learn from each other) in not only the educational programmes but the overall project development.

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APPENDICES

Appendix A: Semi – structured interview questions

Have you say – help to shape participation in water resource management

University of Venda

Department of Ecology and Resource Management

Topic: “Challenges affecting the management of Thulamela wetlands: managers’ engagement with the local communities and their use of wetlands”

INTRODUCTION

WHAT IS THIS QUESTIONNAIRE ABOUT?

The intention for this questionnaire is to collect data on the interest and views of different managers and how they interact with each other and local communities in their wetlands management efforts. Collected data will be analysed to identify relationships that must be taken into account for wetlands management. Your views are essential in assisting this research project to further understand challenges and the importance of stakeholder goal consensus in the management of locally identified wetlands.

WHY SHOULD YOU COMPLETE THIS QUESTIONNAIRE?

The questionnaire seeks the views of anyone who is involved in the sustainable management of natural resource management.

Please complete on behalf of your organisation.

Please note that all responses to this questionnaire will be treated in strictest confidence and all responses will remain anonymous in any written report. You are invited to provide your contact details at the end of the questionnaire in case I would like to follow up any of your answers. You do not have to provide your contact details, if you do not wish to.

Questions

Please may you state your organisational affiliation as well as your role/ position within the organisation.

Section 1. Management of wetlands

1. What are your key objectives set for wetlands management within your organisation?
2. How well do you feel these objectives are currently being met given the current existing wetland management arrangements?

3. Where do you think the improvements should be regarding the current situation in wetlands management?

Section 2. –Understanding stakeholder relationships

1. Do you work closely with other Government and Non-government organisations? Please may you kindly name these organisations.
2. How do you work with other organisations? (prompt meetings, collaborative field activities and report writing, co-funding etc.)
3. What are the benefits you find with working with multiple stakeholders to manage wetlands? What are the major challenges with working with other stakeholders for management of wetlands?

Section 3. Competition to resources

1. Does any competition between your organisation and other stakeholders exist in resource allocation, such as funding?
2. Do you feel other stakeholders yield certain advantages in the allocation of resources? If yes, how?
Do you feel that any resource constraints exist? If yes, how have they affected participation in the management of wetlands by various stakeholders, including your organisation?

Section 4. Overall views on participation

1. Do you feel that as a stakeholder, you are an equal participant in management processes, including decision making? If not, why?
2. What challenges do you specifically face when trying to participate in management processes? (prompt issues of communication of information, time constraints, resource constraints, pre-existing conflicts)
3. Do you feel current arrangements such as meeting frequencies and venue, communication networks facilitate for equal participation in management processes? If not, what can be changed?

Thank you very much.

Feedback with the transcription will be communicated soon. You will have to make an indication if they are true reflection of our conversation.

Appendix B: Questionnaire on local communities

University of Venda

Department of Ecology and Resource Management

Topic: “Challenges affecting the management of Thulamela wetlands: managers’ engagement with the local communities and their use of wetlands”

INTRODUCTION

WHAT IS THIS QUESTIONNAIRE ABOUT?

The intention for this questionnaire is to collect data on the interest and views of local communities and how they interact with the wetlands including the management efforts. Collected data will be analysed to identify relationships that must be taken into account for wetlands management. Your views are essential in assisting this research project to further understand challenges and the importance of stakeholder goal consensus in the management of locally identified wetlands.

WHY SHOULD YOU COMPLETE THIS QUESTIONNAIRE?

The questionnaire seeks the views of anyone who is involved in the sustainable management of natural resource management. Please complete on behalf of your organisation.

Please note that all responses to this questionnaire will be treated in strictest confidence and all responses will remain anonymous in any written report. You are invited to provide your contact details at the end of the questionnaire in case I would like to follow up any of your answers. You do not have to provide your contact details, if you do not wish to.

Participant information

Surname and name:

Location

Phase

Age

Gender

No. of members in a family

Questions

1. Do you have any understanding about the importance of natural resource within this area?

☐ Yes

☐ No

If yes, please specify below

Recourses	Importance
1.	
2.	
3.	

.

2. Are there any agricultural activities community practice in the area?

☐ Yes

☐ No

If yes, please specify below:

1.

2.

3.

3. What are the common crops planted by people in this area?

1.

2.

3.

4. What methods are commonly used for farming?

1.

2.

3.

5. Are people in this area aware of the presence of wetlands?

☐ Yes

☐ No

If yes, explain.....

.....

6. Have you ever received any formal education about wetlands?

☐ Yes

☐ No

If yes, please specify

.....

7. Have you ever received any informal education about wetlands?

☐ Yes

☐ No

If yes, please specify

8. Do you know where you can get such education about wetlands?

☐ Yes

☐ No

If yes, explain.....

.....

9. Have you tried to implement any kind of education method to secure wetlands?

If yes, explain.....

.....

10. Are there any other ideas/ strategies you can think of that could be used to secure wetlands?

☐ Yes

☐ No

If yes, explain.....
.....

UTILISATION OF RESOURCES AND ACTIVITIES

1. Explain briefly what important cultural activities being practiced on these wetlands.

.....
.....
.....

2. Resources

2.1 What type(s) of resources available for use in from this wetland?

- ☐ Water
- ☐ Wood
- ☐ Medicinal plants
- ☐ Reeds
- ☐ Others

2.2 Which resources are the most important to you?

- ☐ Water
- ☐ Wood
- ☐ Medicinal plants
- ☐ Reeds
- ☐ Others

2.3 Why is this particular resource important to your wellbeing?

.....
.....
.....

4. How long have you been using wetlands resources?

.....

.....

5. In your opinion, what attitude do this community have towards these resources?

☐ Positive

☐ Negative

6. Wetlands Protection

6.1 Do you know any system to protect these resources from abuse?

.....

.....

.....

6.2 Do you have any knowledge of wetlands rules and regulations?

☐ Yes

☐ No

If yes, please specify below

.....

.....

.....

7. Activities

7.1 Do you know any activities that are commonly practiced here?

☐ Yes

☐ No

If yes, please specify below

.....

.....

.....

7.2 How many people rough work in each plot of land in the wetlands?

.....

.....

8. Socio-economic status

8.1 Who is a breadwinner in this home?

- ☐ Mother
- ☐ Father
- ☐ Children
- ☐ Grandparent
- ☐ Both mother and father
- ☐ Extended family
- ☐ No one

8.2 How do you get income for supporting this family?

- ☐ Employed
- ☐ Self employed
- ☐ Pension/children grants
- ☐ Family members
- ☐ None

8.3 Do you generate any income from wetlands resources?

- ☐ Yes
- ☐ No

If yes, please specify below

.....

.....

.....

8.4 What is your total household expenditure per month?

Please specify below

.....

.....

.....

8.5 What is your highest level of education?

- ☐ Grade 1 to grade 7
- ☐ Grade 8 to grade 12
- ☐ Tertiary
- ☐ None of the above

8.6 How many household members stay here?

- ☐ 1 to 2
- ☐ 3 to 4
- ☐ 4 to 5
- ☐ 5 to 6
- ☐ 7 to 10
- ☐ 11 and above

9. Do you have any General Comments?

THANK YOU!

Those are all the questions we have.

Thank you very much for your time and cooperation in completing this survey!

If you have any comments that you would like to share with us, please use the space below: