DISSONANCE IN CUSTOMARY AND STATUTORY WATER MANAGEMENT INSTITUTIONS IN THE OKAVANGO DELTA, BOTSWANA

DOCTOR OF PHILOSOPHY

UNIVERSITY OF BOTSWANA

BY

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DEDICATION

This work is dedicated to my late father, Elias Waisva Gondo, my late mother Ennety Mangirazi Gondo, my wife Loyce Waretsa Gondo, my five children Mercy, Tafara, Tatenda, Takunda and Tanaka, my two brothers Godfrey (late), Abraham and my two sisters Randai and Violet.

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LIST OF ACRONYMS

ADB	African Development Bank
ATR	African Traditional Religion
BIWRMEP	Botswana Integrated Water Resources Management and Efficiency Plans
DWA	Department of Water Affairs
DWAs	Department of Water Affairs
DWNP	Department of Wildlife and National Parks
DWS	Department of Water and Sanitation
DWS	Department of water and sanitation
EA	Enumeration Area
FGD	Focused Group Discussion
GS	Geological survey
HHs	Household Heads
IK	Indigenous Knowledge
IKS	Indigenous Knowledge Systems
IWRM	Integrated Water Resources Management
LEDCs	Least Economically Developed Countries
MEDCs	Most Economically Developed Country
MET	Mass-Elite Theory
MLMWSS	Ministry of Land Management, Water and Sanitation Services
MMEWR	Ministry of Minerals, Energy and Water Resources
NWP	National Wetland Policy
O & P	Operation and Maintenance
ODMP	Okavango Delta Management Plan
PI	Principal Investigator

SADC	Southern Africa Development Community
SDGs	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNWWAP	United Nations World Water Assessment Programme
VDC	Village Development Committee
VWDC	Village Water Development committee
W.H.O	World Health Organisation
WB	World Bank
WMP	Water Management Plan
WUC	Water Utilities Cooperation

DISCLAIMER

The work contained in this thesis was completed by the candidate at the University of Botswana between 1 June 2016 and 25 March 2020. It is original work except where due reference is made and neither has been nor will be submitted for the award of any degree or diploma to any other university. The contributions of both the supervisors and co-supervisors to all chapters of this thesis were in the form of comments, questions, and suggestions which helped in organising thoughts.

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ABSTRACT

Failure to integrate customary institutions in water management will negatively affect sustainable water resources management. The need for active involvement and meaningful participation of all stakeholders at all levels of decision making is crucial in water governance. Thus, there is a need for the integration of customary and statutory institutions in the governance of water resources to enable the meaningful participation of local communities. Currently, the governance structure in African countries favours statutory institutions at the expense of customary institutions. Literature shows that the potential role of customary institutions in the governance of water is crucial albeit modern water legal systems in Africa is state-centric. Consequently, the paradigm of the modern water legal systems runs parallel to that of customary institutions.

This study was informed by the institutional bricolage and Mass-Elite theories and positioned in the cultural lag and legal pluralism conceptual frameworks. Using a qualitative research design in a case study approach, the study examined factors engendering dissonance existing between customary and statutory institutions in the governance of water in the Okavango Delta, Botswana. Purposive sampling technique was used to select 44 key informants (comprising village chiefs, deputy chief, chairpersons of Village Development Committees and elderly residents, 16 Department of Water and Sanitation (DWS) and 1 Water Utilities Corporation officials. These were chosen based on their knowledge of institutions and positions in society. Data were gathered through household interview schedules, focus group discussions and key informant interviews in the three villages within the Okavango Delta. Data were also gathered from government documents like Water Act (1968), Water Policy (2012) and Water Bill (2005).

Results showed that the dissonance between customary and statutory institutions in the governance of water was shaped by the perceptions of respondents. For instance, while devotees of statutory institutions perceived water as an economic good that warrants competitive market-based pricing to recoup costs incurred in the processing and provision of water infrastructure, customary institutions supporters argued that water is a social good as it is a God-given commodity which is non-substitutable and is indeed a basic right rather than a commodity for sale. Findings indicated that while 85% of the residents obtained water from standpipes, 93.8% of them travelled less than 1 kilometre to make a complete journey to and from water sources. A Kruskal Wallis test revealed a statistically significant difference ($X = 5.2$; $p = 0.014$) in the mean ranks of water expenditure across income groups. Demographic, cultural and socio-economic variables were crucial in the governance of water. Findings also revealed a deep animistic belief in water and that statutory institutions approach to solving water problems was not in tandem with the expectations of the local people in the Okavango Delta. Lastly, the results indicated that water sector reforms were in progress in Botswana.

In line with the findings, policymakers need to take cognisance of the spiritual dimension of water management within the context of the customary institutions to enhance sustainable water management, particularly in grassroots communities. Thus, there is a need to repeal the current water legislation and ensure that water for domestic purposes is subsidised by both affluent consumers and the government. There is also a need for the harmonisation of the two genres of water institutions by ensuring that water-related conflicts in rural areas are resolved within the customary institution's codes of conduct with only complex cases referred to the statutory tribunal.

Part 1

Introduction

CHAPTER ONE

1.1 THESIS BACKGROUND AND CONTEXT

Failure to integrate customary institutions in water management will negatively affect sustainable water resources management. The need for active involvement and meaningful participation of all stakeholders at all levels of decision making is crucial in water governance. Thus, there is a need for the integration of customary and statutory institutions in the governance of water resources to enable the meaningful participation of local communities. Currently, the governance structures in African countries favour statutory at the expense of customary institutions. Literature shows that the potential role of customary institutions in the governance of water is crucial albeit modern water legal systems in Africa is state-centric. Consequently, the paradigm of the modern water legal systems runs parallel to that of customary institutions. In line with the main objective of this study which is, "To analyse the factors engendering the dissonance existing between customary and statutory water management institutions in the Okavango Delta in Botswana and based on Kuran (1998) who defines dissonance as lack of harmony or agreement between things, in this thesis dissonance is to be understood as referring to inconsistencies, contradictions and lack of agreement in terms of knowledge, opinions or beliefs about water governance and management. On one hand, customary institutions refer to the unwritten and nationally unrecognised and unofficial humanly devised mechanisms regulating water use mainly in rural setups such as taboos, norms and spirit mediums as well as the recognised institutions like Kgosi (Chief) and Village Development Committee (VDC). On the other hand, statutory institutions denote nationally recognised, written and documented humanly devised constraints like water legislations, the policy as well as organisations such as Water Utilities Cooperation (WUC) and Department of Water and Sanitation (DWS) (Gondo, et al., 2019). This is similar to North (1990) and Horak and Restel (2016) who also dichotomised institutions into formal (statutory) and informal (customary) where formal institutions are

represented by written and codified law, courts and bureaucracies and shaped, communicated and implemented through official channels against the informal institutions which are unwritten and socially constructed, shared and enforced outside of official channels.

United Nations Development Programme (2001) and Global Water Partnership (2002) define water governance as ".....the range of political, social, economic and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of society". Thus, it is understood as a set of procedures, institutions and actors that determine how decisions are made and implemented in water distribution and use (UNDESA et al., 2003; Secco et al. 2011). In the context of this thesis, the term water governance is to be understood following Bakker's (2003) definition of water governance which asserts that it is the range of processes through which community interests are articulated, their input is incorporated, decisions are made and implemented and decision-makers are held accountable in the delivery and management of water services (Bakker, 2003).

Since 1960, national governments have continued to introduce or strengthen neoliberal ideologies in water institutions (Van Koppen *et al*., 2014; Joy *et al.,* 2014). The review of water institutions was not only done in the Least Developed Countries (LDCs) but also in Most Developed Country (MDCs). For instance, water institutions were revised in the United Kingdom in 1963 and France in 2000. A notable trend at the global level has been the exclusion or replacement of customary management institutions by statutory institutions. Water reforms in Canada and Australia replaced customary water management practices with statutory institutions (Yates et al., 2017; Bark et al., 2012). Although there is a notable change relating to water ownership, however, the roles of customary rules and leadership in water governance are not spelt at the global level (Yates et al., 2017). The reforms then warranted the introduction of neoliberal policies which impel governments to privatise state services and utilities (Joy et al., 2014). It is during this

period that water was transformed from a public good into an economic good, thereby resulting in the dissonance between customary and traditional water management practices in which water is perceived as God-given, and held in trust by the spirit mediums (Joy et al., 2014). Thus, the concept of water ownership and use in traditional society does not recognise the idea of water as private property but abides by the spirit of collectivism (Bark et al., 2012). Indigenous people are connected to and responsible for water as they obtain and maintain their spiritual and cultural identity, life and livelihood from it (Yates *et al*., 2017). This implies that the indigenous people of Australia, Canada and other nations are likely to be endangered due to the commodification of water. Since indigenous people are spiritually connected to water and all related resources connected to it, thus they took it as their responsibility to manage cultural significant sites located along river banks to protect indigenous cultural heritage and knowledge associated with water and water places.

This revision of water institutions was also witnessed in Africa due to colonialism (Koppen & Van der Zaag, 2011). Water institutions as indicated in water Act no. 31/1998; 22/2001, Chapter 20:24 was instituted in Zimbabwe in 1998. Following suit, Zambia also pronounced the Water Resources Management Act, no.21 of 2011 (Dorm-Adzobu & Ampomah, 2014). In most cases, plural water institutions were replaced by nationwide statutory water institutions (Komakech, 2013). The permit system was introduced in all southern African countries where water institutions amendments were done (Kellert et al., 2000) making water a state property. Under these regimes, water is declared public water and thereby vested in the State in most or all the countries where the permit system has been adopted (Mtisi, 2011). Under the new arrangement, citizens can obtain lawful access to water either by applying for administrative permits (Hodgson, 2006) or by being formally exempted from such obligation (Kellert et al., 2000). This arrangement disadvantaged the poor, indigenous people who regard water as God-given and hence free. The permit system is viewed by Gachenga (2012) and Mtisi (2011) as appropriate to

water regulation since sharing of water can lead to conflicts. Such institutions at the international level, for instance, contradicts and conflicts with traditional customary water management practices.

All water institutions in southern Africa stipulate that all water in affected countries belongs to the State. This reflects the legacy of colonialism as this was adopted from the Roman-Dutch Law or English Common Law (Caponera & Nanni, 1992). Little attention has been paid to the role of customary institutions and another locally developed normative system (Campbell et al., 2001). Like in many other African countries, existing conflicts between customary and statutory institutions in Botswana are a result of colonialism though the country was not a colony. Indeed, conflicts between customary and statutory institutions in the Okavango Delta began way back in 1885 with the British colonial rule (Mbaiwa et al., 2008). Statutory institutions such as the Fauna Wildlife Act of 1961, which led to the establishment of Moremi Game Reserve, prohibit the use of natural resources by indigenous people of the study sites. Consequently, an area of 4 610 km^2 was taken from indigenous people (Department of Wildlife and National Parks (DWNP), 1991) to pave the way for the game reserve and in so doing denying several ethnic groups access to natural resources in the area (e.g. water). Estimates by the DWNP (1991) are that between 1500-2100 indigenous people were forcibly moved out of the area in 1963. Accordingly, even up to today the BaSarwa ethnic group among others still claim the land as their ancestral home (Mbaiwa et al., 2008). Natural resources like water will continue to degrade in the delta if without the harmonisation of customary and statutory institutions. Mbaiwa et al. (2008) argue that "the contention and latent conflict between poor marginalised rural communities and state institutions over historically embedded resource use can also become a cause of resource degradation". As a result, indigenous people of the study sites perceive statutory institutions as encroachments and denial of their territorial rights and traditional land and related resources use and livelihood base.

Table 1: Definition of terms

Term	Operational/theoretical definitions
(i) **Water as an economic good**	• Water should be priced at its economic value (Perry et al., 1997; Rogers et al., 2002; Briscoe, 2005). • A process of integrated decision making on the allocation of scarce water resources (Savenije, 2002). • Involvement of a fee, be it user, connection, disconnection or reconnection and/or maintenance
(ii) **Water as a social good**	• Water management needs to reflect opinions of both customary and statutory institutions and where a payment is to be done it needs to consider the plight of the poor and marginalised people within the society.
(iii) **Kgotla**	• A forum where community consultations take place (Schapera (1994). • A meeting place where water issues are discussed.
(iv) **Ethnic group**	• Human groups with a similar belief, common descent and customs (Bös, 2015).
(v) **Kgosi**	• Eldest male, born of royal blood who is a leader of a tribe (Schapera, 1994).
(vi) **Taboo**	• An avoidance rule (Chigidi, 2009).
(vii) **Sacred**	• A holy and restricted (Clemence and Chimininge, 2015).
(viii) **Norm**	• Approved societal values and expectations (Fershtman et al., 2011).

1.2 INDIGENOUS PEOPLE, KNOWLEDGE AND WATER MANAGEMENT

Based on Mauro and Hardison (2000), Dates-Bah (1998), Béteille (1998), Morris (2010), Maranga (2013), Etemile (2013), Mizutani (2016), Kumar (2018) and Fitzmaurice (2018) indigenous people are distinguished by their characteristics that they have a self-identification as indigenous and have a descent from the occupants of territory before an act of conquest. Such people possess a common history, language, and cultures. Amongst the list of criteria to define an indigenous person is the possession of common land and exclusion or marginalisation from political decision-making. Such people are usually unrecognised by the dominating ethnic and governing groups of the state. However, the United Nations Human Rights (UNHR) Fact Sheet No. 9/Rev.2 (2013:2) posits:

There is no singularly authoritative definition of indigenous peoples under international law and policy, and the Indigenous Declaration does not set out any definition. Articles 9 and 33 states that indigenous peoples and individuals have the right to belong to an indigenous community or nation, following the traditions and customs of the community or nation concerned, and that they have the right to determine their own identity.

Thus, based on the criteria used to identify an indigenous person and following Bolaane's (2002) assertion that BaSarwa were the first group of people in the Okavango and therefore BaSarwa ethnic group are considered indigenous people in the actual sense of the definition. However, considering the sentiments of various scholars and the elusiveness of the term indigenous people and UNHR Fact Sheet No. 9/Rev.2 (2013) distinguishing between who are indigenous people amongst the ethnic groups and who is not in the Okavango Delta is outside the scope of the study and as such wherever in this thesis it is mentioned the term 'indigenous people' refers to an individual who by belonging to any one of the ethnic groups (BaKalanga, BaNambjwa, BaXhereko, HaMbukushu, BaHerero, BaYeyi, BaTawana and BaSarwa), participated in this study and was a permanent resident of any one of the study sites of Shakawe, Shorobe and Tubu between 1st of July 2018 and 31st of December 2019 and lived following and embraces the culture of these villages is regarded as an indigenous people. Table 2 summarises the perceptions of indigenous people on water management.

Table 2: Perceptions on water management

- Water bodies have a spiritual significance (Trigger, 1985; Blackstock, 2001; Groenfeldt, 2006).
- Water is a God-Given/divine agent/ gift of nature (Sarpong, 1998; Akpabio, 2011, 2012; Gondo et al., 2018).
- Water sources originated from mythic beings (Tan, 1997; Strang, 2005).
- Water values relate to sociality, sacredness, identity and life-giving (Jackson, 2007)
- Spirits permeate and animate in water (Sarpong, 1998).
- Water misuse attracts punishment from water spirits (Dudley et al., 2009; Akpabio, 2011, 2012).
- Certain water sites are sacred and crucial for survival (Verschuuren, 2012).
- Meaning, images and understanding of water vary depending on individual or group background (Akpabio, 2011).
- Water is a dwelling place for spirits (Kapfudzaruwa and Snowman, 2009; Sichone, 2007; Nkonya, 2008).

- Water problems are solved by communicating with water spirits through the chiefs and spirit medium (Sarpong, 1998).
- Water management is spiritual (Ramazzotti, 2008).
- Water cures the sick and cleanses bad omen (Strang, 2005)
- Water cures infertility (Strang, 2005; Sarpong, 1998)
- Water is freely shared (Strang, 2005; Akpabio, 2011; Nkonya, 2006; Mowo et al., 2013)
- Water is a symbol of power (Strang, 2006; Appiah-Opoku, 1999).

Key points about indigenous people emanating from their perceptions about water as summarised in Table 3 are that water is life, a gift from nature and the embodiment of spirits. From the position of the customary institutions as outlined in this thesis the meaning of water is a gift of God is that it cannot be commodified and is a perfect resource that deserves special management and needs to be managed in a pluralistic manner between customary and statutory institutions. While the notion of perfectness attached to water by indigenous people promotes responsible use and management of water, there is a bad side to it. The negative side about treating water as a gift of God and the notion of perfection attached to it tends to make indigenous people overlook water quality issues. Thus, amongst the indigenous people even when the water source is physically very poor, it can still be used for drinking in its raw state and other purposes. As such indigenous people tend to obtain their daily water from whatever source irrespective of quality (Akpabio, 2011, 2012; Gondo et al., 2019). Despite the bad aspect of customary institutions in terms of water use and management as noted above customary institutions have a role to play especially at the local level in rural areas such as the Okavango Delta in Botswana or perhaps elsewhere in Africa and beyond where indigenous people are found. Therefore, this study aimed to harmonise the two institutions by understanding customary and statutory institutional factors engendering disagreement between them in the study sites in the Okavango Delta.

The United Nations Environment Programme (UNEP 1998) asserts that indigenous knowledge or local knowledge is a form of rational and reliable knowledge developed through generations of intimate contact by indigenous people with their lands that have equal status with scientific knowledge. Indigenous knowledge is the local knowledge that is unique to a given culture or society which contrast with knowledge generated by universities, research institutions and private firms (Warren, 1996; Kolawole, 2015). It is knowledge produced in a specific social context and employed by the lay people in their everyday lives (George, 1999). In the context of this study and line with the definitions given by the scholars, indigenous knowledge refers to the part of the lives of the rural communities of Shakawe, Shorobe and Tubu which encompasses their water management and governance skills, beliefs, taboos, traditions, norms and experiences which is essential for their survival. Table 3 shows the nature of indigenous knowledge as distinguished between customary and statutory institutions.

Table 3: Nature of knowledge in customary and statutory institutions

Statutory institutions	Customary institutions
• Written and codified	• Unwritten
• Transmitted as written documents	• Oral transmission
• Recognised nationally	• Recognised within a and vary
• Expensive	• Cheap
• Courts usually found in urban areas	• Courts are within the locality
• Use of technical foreign language	• Use of simple local language
• Complex and archaic	• Simple and 'modern'
• Adversarial or punitive	• Restorative
• Private resources ownership	• Community resources ownership
• Property rights required	• No clearly define property rights
• Compensations are for the state	• Compensation is for the aggrieved person
• Non-spiritual	• Grounded on the spiritual value system
• Requires specialists	• Expressed through teachings of elders
• Aims to maximise profit	• Free/open sharing of resources
	• Reciprocity/equal exchange of resources
	• Solidarity/brotherhood i.e. helping those in need.

Source: Appiah-Opoku, 1999; Maganga, 2003; Kuruk, 2004; Ramazzotti, 2008; Sarpong, 2005; Latham and Chikozho, 2004; Nkonya, 2006

Before colonisation in Africa generally, customary institutions governed water resources in rural communities (Turner, 2013). In such institutions, traditional leaders had key roles in natural resources management including water. Their functions included allocation of land and water including mediating land and water-related cases and these functions were informed by cultural practices and customary rules (Kapfudzaruwa and Snowman, 2009, Sichone, 2007). The operational structure of customary institutions before colonisation was hierarchical. The hierarchy of water management in the indigenous community comprised the chief is at the top and below him was the headman (Sichone, 2007; Kapfudzaruwa and Snowman, 2009; Singh, 2006). The spirit medium was one of the important customary institutional entity for communicating with ancestors especially for rain making purposes (Kapfudzaruwa and Snowman, 2009). While the chief was the head of all customary institutions, the chief delegated duties to the headman in cases where the chief was too far from some villages. However, if the headman failed to handle some cases he would pass them to the chief to solve. After the chief and headman then individual heads of household (mostly men) followed and women come last in the hierarchy.

Table 4: Hierarchy of water management within customary institutions

Rank	Function and Roles
(i) Chief	• Overseeing all water-related issues • Ensuring availability of water to community members • Resolving water conflicts and disputes • informing community members about rainmaking ceremonies • Warning and pushing culprits caught breaking water rules • Ensuring maintenance and protection of water sources • Supervising the headmen and spirit mediums
(ii) Headmen	• Representative of the chief • Acts as chief when the chief is far • Ensuring and maintenance of water sources • Ensuring peace in times of conflicts

	• Ensure that people do not fight at the wells. • Maintaining and protecting water sources • Setting rules/taboos for water sources with the chief
(iii) Spirit mediums	• Predict rain • Leading the team conducting rain making ceremonies • Officiate at rain making ceremony rituals
(iv) Men	• Assign water-related duties • Supervise family members on water tasks • Cleans water points
(v) Women	• Responsible for fetching water for the household • Ensuring water is always available within the dwelling

Source: Adapted from Sichone, 2007; Twikirize, 2005 Kapfudzaruwa and Snowman, 2009

Based on Mastrian (2001) perception is how something is regarded, understood, or interpreted. In this case therefore perception means the way different ethnic groups in the Okavango Delta perceived, understood and interpreted water governance and management. Thus, within the indigenous communities, cultural values are part of water law. Indigenous people believe that there are a potential risk to their lives, cultural and spiritual values when water is degraded by human activities (Framingham, 2008). Therefore, water is vital for economic development. In this regard, Tan (1997) argues that to enable indigenous people to protect and manage water, there is a need for a provision at a national level to recognise their aspirations and values which they attach to water. However, owing to the differences in aspirations and perceptions of indigenous people at a global level, the challenge for statutory institutions is in identifying and understanding the means available to incorporate indigenous people's social and customary water needs and management styles (Douglas, 2004). This is so considering that customary institutions ways of water management seem to be complex especially if understood from a global perspective and that the norms, taboos and values are unwritten and can only be recalled

by elderly members of the community. Table 3 summarises the perceptions of the water by indigenous people across the globe.

1.3 Hierarchy of water management within statutory institutions in the Okavango Delta

At the top of the hierarchy of water management institutions is the Ministry of Land Management, Water and Sanitation Services (MLMWSS). The ministry is responsible for coordinating the development and operational activities in the water sector (the Republic of Botswana, 2013). Specific programmes to fulfil these responsibilities are delegated to the Department of Water and Sanitation (DWS) and Water Utilities Cooperation (WUC). The ministry's role is to provide leadership and policy directions to the departments and parastatal ((Republic of Botswana, 2012). The ministry is responsible for formulating, directing and coordinating the overall national water policy. The DWS acts as a secretariat to the Water Resource Board (WRB) and it provides technical expertise. The department is also responsible for planning, developing and maintaining water resources for domestic, agriculture, commercial, and industrial and other uses in the whole country. It also assists in and advises on the formulation of water policies and it administers water law and related legislations. It is also within its mandate to liaise with riparian users of national and international rivers regarding saving, conserving and protecting water resources.

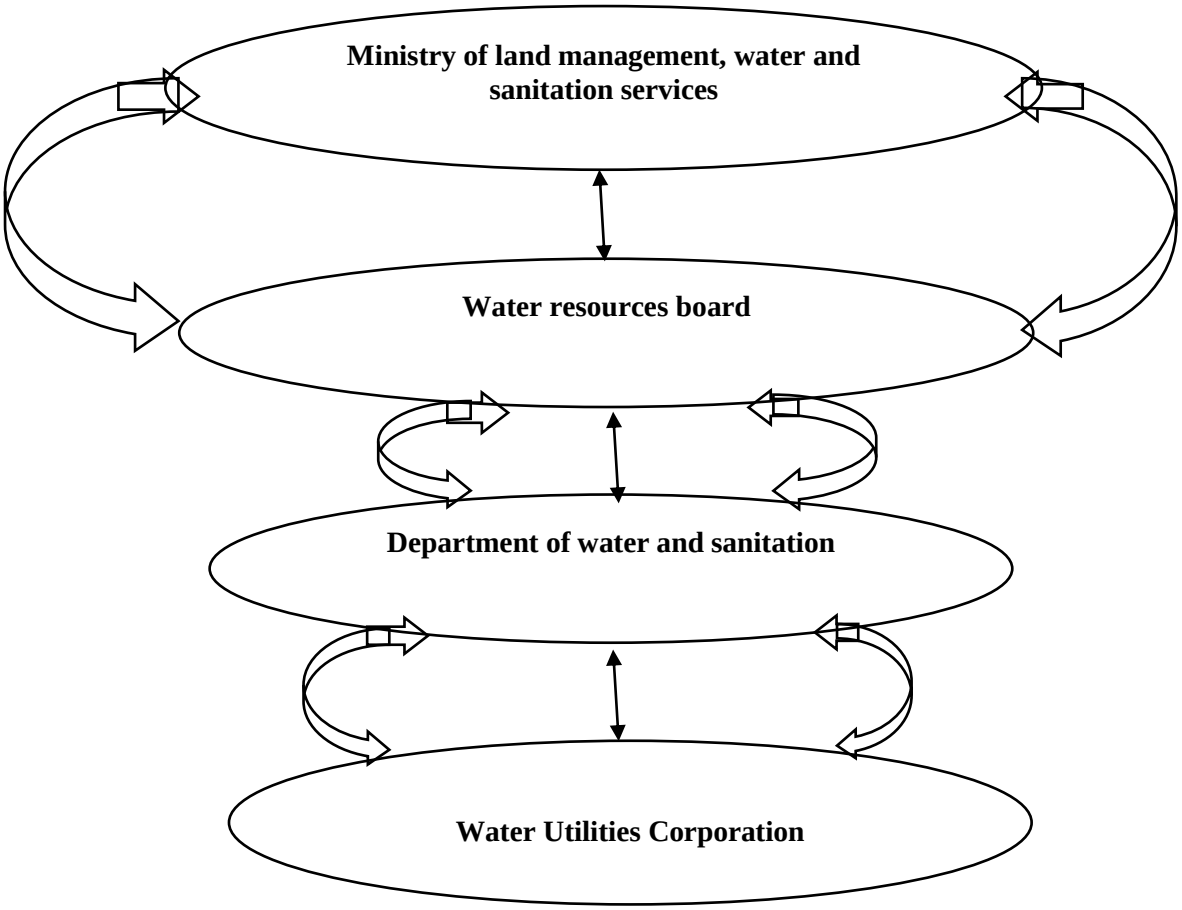

Figure 1: Statutory institutions in Botswana (Source: Gondo and Kolawole, 2020 in-Press)

WUC, a parastatal, was established under the Water Utilities Cooperation Act of 1970 (Laws of Botswana CAP 74:02). The institution was established to supply and distribute water within the Shashe development area however, powers were also conferred upon it to supply water to all cities, towns and villages across the country. The WUC Act (1970) specifies methods of charging for water to ensure that WUC runs on a commercial basis and that the cost of water supply services is recovered.

1.4 PROBLEM STATEMENT

Contemporary decision-making structures in water management rely heavily on scientific and expert knowledge (Johnston et al., 2011). This is despite that local realities often vary from the summary statistics statutory institutions base their conclusions on (Nakashima and Nilsson, 2006). Local knowledge systems have guided and continue to guide on the ground practices

across the world (Nakashima and Nilsson, 2006). These local knowledge systems stem from long periods of adaptation to the specific socio-ecological environment and they illustrate society interaction with the environment and have the capacity to adapt. Local knowledge on water management constitutes the base for local decision making and as such should not be ignored (Berkes, 1999; Rodrigues, 2006). Profit maximisation as the main motive of statutory institutions decision making need not be the foundation for water management that include a diversity of stakeholders especially indigenous people in remote rural areas. Although statutory institutions' values may represent the interests of many people, solutions to water problems should be following the values and beliefs of all participants including indigenous people to be effective (Bouwen and Taillieu, 2004, Nakashima and Nilsson, 2006; Schusler et al., 2003). There is a mismatch and contradictions between customary and statutory institutions for water management and statutory institutions do not recognise customary institutions for water governance in the Okavango Delta in Botswana. This is despite African researchers who argue that failure to accommodate or integrate customary institutions systems into water resource use would adversely affect the attainment of sustainable water management (Kuruk, 2004; Latham & Chikozho; Juma & Maganga, 2005). As recognised by the 'The Future We Want' declaration, the need for the active involvement and meaningful participation of all stakeholders including indigenous people, women, children and local communities, at all levels of decisions making, planning and implementation of policies and programmes is crucial for sustainable water governance (Gachenga, 2012; Orebech, 2006). Many indigenous people and local communities use customary institutions to govern their natural resources (Ariyaratne, 2016; Kuruk, 2004). The active involvement and meaningful participation of indigenous people and local communities would then imply the integration of their customary institutions (including those on water governance) with statutory institutions. Presently, the scenario in most southern African countries favours statutory institutions at the expense of customary

institutions. This situation applies to all African countries with a colonial history. African states adopted colonial water management structures and institutions after gaining independence. While the potential role of customary institutions in the governance of water resources may be of value, most modern water legal systems in Africa are primarily statute-based and state-centric (Mensah & Oduro, 2007). There is little room for recognition of customary institutions in these state-based water institutions. For instance, there is no mention of customary institutions in the Botswana Water Act (1968) and the Water Policy (2012). The paradigm in which modern water legal systems are conceived does not adequately recognise customary water management systems for the governance of water particularly in rural areas in which most people in Africa live. Although the Okavango Delta is an arid environment, the rural people living in the area have continued to survive on the available, limited water resource even before the use of statutory institutions. For instance, water diviners were able to locate groundwater using sticks (Cassidy et al., 2011). The method used in water divining was quick, simple, and reliable and competes favourably with modern technology (Cassidy et al., 2011). The key issue then is probing the existing indigenous systems and determining the extent to which they can and may be incorporated in the statutory water management systems and how they may have impacted sustainable water resource management.

In Botswana, water access and use are governed by statutory institutions. These include the Water Act (1968), Water Policy (2012), Water Management Plan (2010) and the Botswana Integrated Water Resources Management and Efficiency Plan (2013) as well as other water-related policies, which will be discussed later. Expectations were that since Botswana has adopted the Integrated Water Resources Management (IWRM) concept as the key driver in water resources management guidelines, all its statutory institutions and management practices would be reviewed to align them with the four principles of IWRM as outlined in the Dublin Principle document.

However, documentary evidence and literature have shown that there are contradictions and conflicts between statutory and customary water management institutions and practices in Botswana. These contradictions are, to a greater extent, affecting access and use of water in rural areas, especially in the Okavango Delta. While IWRM has, however, been adopted and widely practised, it has not been fully recognised as the cornerstone of water resources management (BIWRMEP, 2013).

In analysing the cause of natural resources degradation in the Okavango Delta, the National Wetland Policy (NWP) (1999) implicates the flood recession farming in Okavango Delta, traditionally known as Molapo farming, as being among the major cause of degradation. Consequently, the policy (NWP) contradicts the traditional, sustainable livelihood to which indigenous people of the study sites have practised for many years. In other words, the policy outlaws Molapo farming, albeit the same policy recognises the public and grassroots people as major development players and should be involved in the management and monitoring of wetlands through the use of local knowledge (Kolawole, 2015). There are also contradictions about who should enforce and implement institutions especially in rural areas (the Okavango Delta in this case). The Water Act (1968), Water Policy (2012), BIWRMEP (2013), the National Wetlands Policy (1991) among others cite DWA and Water Utilities Corporation as the only institutions to implement and enforce water institutions in the whole country. Thus, while the statutory institutions emphasise statutory institutions as the only key institutions' enforcement agents, indigenous people of Okavango Delta feel that customary institutions have the same authority over the resources at their disposal (Mbaiwa et al., 2008, Jasen & Madzwamuse n.d.; Traill, 1998). While customary institutions are unwritten (Kuruk, 2004), these rules are strong enough to forbid such actions that degrade resources especially water (Sarfo-Mensah & Oduro, 2007). These rules are culturally prescribed taboos that speak of values such as sharing of resources such as water (Gadzirayi & Chihiya, 2006). These taboos

teach individuals to have self-restraint or discipline in utilisation and discourage wasteful and destructive water use practices (Craig & Gachenga, 2010). Such rules are culturally reinforced by peoples' beliefs in nature spirits. Despite all this, statutory institutions in Botswana continue to focus on statutory institutions like DWA and WUC, which are more urban-oriented and never serve the needs of rural people (Scudder, 1993).

Another area of dissonance is in water ownership. While water can be owned either privately or by the public under statutory institutions (Craig & Gachenga, 2010), water is perceived as God-given under customary institutions and practices (Latham & Chikozho, 2004) and is granted and entrusted by the Creator to spirit mediums (Chikozho & Latham, 2005). Thus, the notion of ownership, access and use does not recognise the idea of water being private property as in statutory institutions but abides by the spirit of collectivism. It is this private concept of water ownership that resulted in the conflict between the San people and the government of Botswana which led to the 9th July 2010 High Court of Botswana landmark ruling against the San, denying them the right to access water on their ancestral lands within the Central Kalahari Game Reserve (Sarkin & Cook, 2012). Thus, all current Botswana statutory water management institutions, like in any other African state, entrust all water within the country to the state and in turn, the state transfers the rights to water provision and management to non-governmental institutions. There is a disagreement between statutory and customary water management institutions in the Okavango Delta and therefore this study focused on the dissonance that characterises customary and statutory water management institutions in the Okavango Delta in Botswana. The study adopted institutional bricolage theory by Cleaver (2001) to guide the analysis of customary and statutory institutions for water governance and management in the Okavango Delta in Botswana.

1.5 RESEARCH OBJECTIVES

The general objective of this study was to analyse the factors engendering the dissonance existing between customary and statutory water management institutions in the Okavango Delta, Botswana and the specific objectives were to:

(i) Analyse demographic and socio-economic factors influencing the dissonance existing between customary and statutory water management institutions and practices in the Okavango Delta;

(ii) Examine cultural factors influencing dissonance existing between customary and statutory water management institutions and practice in the Okavango Delta;

(iii) Analyse institutional related factors engendering the dissonance existing between customary and statutory water management institutions in water access in the Okavango Delta; and

(iv) Assess stakeholders' perceptions of the management of water through customary and statutory institutions in the Okavango Delta.

1.6 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This section of the thesis looks at the dissonance and conflicts in customary and statutory institutions and practices from a global, regional and local level.

1.6.1 GLOBAL WATER RESOURCE MANAGEMENT PRACTICES

Worldwide, traditions are unique to different ethnic groups (Gachenga, 2012). In most rural communities, traditional or customary institutions are a form of cultural identity, which upholds their worldviews and therefore gives them a sense of identity (Chikozho & Latham, 2005). So far, findings of research in Africa show that traditional or customary practices still exist and are still very strongly rooted in rural communities (Dore, 2001; Juma & Maganga, 2005; Latham & Chikozho, 2004; Manzungu & Machiridza, 2009). This body of literature reveals that traditional systems of water institutions prevail in rural communities and often are

effective and have survived many centuries. Most importantly they have not been completely weakened by the colonial or post-colonial state (Sulemana, 2013; Twikirize, 2005). These customary institutions are well understood by the local people and are functional because they bear semblance with their worldviews (Sulemana, 2013). At an international level examples of traditional water management commonly practised in rural areas include the Qanat irrigation scheme in Mexico (Whiteford, 1989), valley Irrigation in Cochabamba, Bolivia (Gutierrez and Gerbrands, 1998) and in Ecuador (Apollin et al., 1998), tank irrigation in Sri Lanka (Leach, 1961) and hill irrigation of Nepal (Yoder and Martin, 1998). The above illustrates the cases of traditional water management practices which were practised all over the world. These traditional water management practices tend to be unique to various societies. For instance studies of customary water management practices in Kenya have revealed that *Fanya juu;* a traditional practice for capturing run-off in agricultural fields was very sustainable in water management (Gachenga, 2012; Kuruk, 2009; Twikirize, 2005). In India, traditional water harvesting techniques were practised over a long period and were sustainable (Perreault, 2008). Examples of traditional water management practices in India include *Tankas,* which were small tanks placed underground to harvest underground water (Barks et al., 2012). There were also the *dhora* techniques that were used to harvest surface run-off water for irrigation in India. These traditional water harvesting techniques were adopted in India depending on the cultural value system of the regions and were carefully maintained, appropriately located and constructed with simple locally available, yet excellent engineering techniques (Perreault, 2008).

However, an all-inclusive water management model seems to be the New Zealand water governance system. In this country, governance of water has undergone significant restructuring in the past two decades, with wide-ranging changes. There was a revival of indigenous Māori customary rights which resulted in the government recognising and

incorporating customary water management institutions into statutory institutions within the New Zealand society, particularly that of the *Maori Ngai Tahu* tribe in the Canterbury region of the south island of New Zealand (Memon & Kirk, 2012). In line with the Treaty of Waitangi (1840), there was a realisation of injustice caused by the dispossession of natural resources and impoverishment of the Māori indigenous group (Harmsworth & Robb, 2016). Consequently, the uniqueness of the New Zealand water management framework is that the perceptions of the Māori tribe which emphasise cultural and spiritual beliefs; the physical and spiritual realms of water are interlinked with statutory institutions which help to iron out the tension between the two institutions and promotes compliance to water management legislations. Therefore, in Canterbury, New Zealand, access to water is governed by both customary and statutory institutions and water is free to every individual be it urban or rural (Kanwar, Kaza, & Bowden, 2016; Memon & Kirk, 2012). The customary and statutory water institutions have an equal say in the management of water. The basic tenets of the traditional Māori society are still very strong and influential about access and use of water in both rural and urban environment.

Literature has shown that globally, customary and statutory water institutions contradict in several ways (Gachenga, 2012; Barks et al., 2012; Coleman, 2012; Killander, 2010; Kuruk, 2004; Latham &Chikozho, 2005; Maganga, 2003; Sarpong, 2005). For instance, in the Philippines water was culturally perceived to be availed by the Supreme Being commonly known by various names like *Bathala*, *Kabunian* or *Apo Sandawa* (Coleman, 2012).

1.6.2 REGIONAL WATER MANAGEMENT PRACTICES

In Africa, there is a conflict between statutory and traditionally water resource management practices. For example, studies were undertaken in Nigeria (Kuruk, 2004), Ghana (Sarpong, 2005), Kenya (Craig & Gachenga, 2010) and Zimbabwe (Latham & Chikozho, 2004) show that African rural people believe that traditional water resources management is enshrined in cultural beliefs, norms, taboos and values and are enforced by prohibitions (Mogende &

Kolawole, 2016). Despite that local knowledge have guided the ground water management practices across the world (Nakashima and Nilsson, 2006), such management practices have no modern backing (Ofori, 1977), even though they were and are still strong enough in the rural areas where people obey them (Juma & Maganga, 2005; Maganga, 2003; Mensah & Oduro, 2007).

The colonisation of African states like Malawi, Zambia and Zimbabwe, brought in the use of statutory institutions in water management. Although statutory water institutions are meant for the management of the whole country's water resources, research has shown that it is most effective in urban than in rural areas (Craig & Gachenga, 2010; Juma & Maganga, 2005; Sarpong, 2005). The formulation of statutory institutions contradicts and conflicts with the customary institutions in most cases. While certain African countries (Nigeria, Ghana, Kenya and South Africa) do recognise customary institutions, however, they have not done much to show commitment to embrace traditional water management practices (Ajai, 2012; Craig & Gachenga, 2010; Sarpong, 2005). This is even though doing so would increase levels of acceptance (Ajai, 2012) and makes the administration of water practical (Maganga, 2003; Sarpong, 2005). For instance, Rodriguez (2006) argues that an acequia (ditch system) which is a traditional water management practices in northern New Mexico influences identity formation, community, culture and a sense of place for the locals that outweighs the scientific value of water management that statutory institutions value most. Literature has also shown that statutory institutions take along to enact (Ajai, 2012; Kuruk, 2004; Latham & Chikozho, 2004). Once in place, however, it takes longer to be revised to adhere to the current situation prevailing within a country (Borell, n.d.; Stevens & Speed, 1977). This is the case in most southern African states like Botswana where Water Act (1968) is still in use fifty-two years after its enactment.

The accommodation of customary institutions for water governance in Africa's statutory institution's framework for water resources is dependent on the extent to which customary institutions are recognised in the general legal framework (Gachenga, 2012). As indicated in the previous sections, African countries adopted either the English Common Law or Roman-Dutch Law during the colonial era, depending on those that colonised them. Colonialism indeed marked the beginning of the destabilisation of customary institutions in Africa (Bois, 1994). Under the new legal system, customary institutions fail to automatically qualify as law (Allott, 1984; Bois, 1994). While customary institutions were to some extent recognised by the colonial legal system, its application is seen by Gachenga (2012), Allott (1984) and Bois (1994) as only limited to native courts, thus representing an exception as opposed to recognition of a parallel legal system. Furthermore, to be recognised by statute, customary institutions in English speaking African countries had to demonstrate criteria required by colonial masters' statutory for validity including immemorial usage, uniformity, invariability, continued usage, reasonableness, as well as not being contrary to justice or morality (Gachenga, 2012; Allott, 1984; Kane, 1950). The imposition of these criteria for the validity of customary institutions, which was most common across English colonies, resulted in the lack of recognition of customary institutions as law (Kane, 1944).

1.6.3 WATER MANAGEMENT PRACTICES IN BOTSWANA

Like in many other African countries such as Zambia and Zimbabwe, Botswana's statutory water management institutions contradict the traditional customary water management practices. In Botswana, water access and use are governed by Water Act (1968), Water Policy (2012), Water Management Plan (2010) and the Botswana Integrated Water Resources Management and Water Efficiency Plan (BIWRMWEP) (2013). These together form the statutory water institutions and practices in the whole country. Based on the Water Act (1968), any person within Botswana can abstract water from any public stream for domestic use. It also allows

individuals who own pieces of land to sink a borehole at his/her land but the water should be for domestic use only (Government of Botswana, 1967).

Besides the contradictions with customary institutions, which will be outlined later, the act has several weaknesses. As it was enacted in 1968, the Act does not provide for integrated water resources management as enshrined in the BIWRMWEP (2013) and current issues like climate change are not addressed. It places little emphasis on pollution. Ignoring pollution issues now when human populations have increased to 2.2 million people as against the population of 650 835 people in 1968 is disastrous (Statistical Yearbook 2012/13, 2015). Furthermore, there are no provisions for the management of shared watercourses. Thus, the act is not in line with the Southern Africa Development Community (SADC) protocols. The monitoring and enforcement of water use are inadequate (Tumisang, 2006). The penalties for non-compliance were pegged in 1968 and were high by then but have not been adjusted and are now very low. For instance, a person who is guilty of an offence under sections 9(2) and 36(1) of the Water Act (1968) is liable to a fine not exceeding P1000 or imprisonment for a term not exceeding one year or both (Government of Botswana, 1967). There is also a lack of integrated planning in land and water resources planning. This is a major default that leads to the main problem with the statutory water management institutions of Botswana. Furthermore, the Act does not incorporate the needs and values of the people in rural areas. It is silent on the role of indigenous knowledge in the management of water especially in the remote, rural areas of the Okavango Delta.

Despite the international obligations to protect the rights of indigenous people to water, Botswana's statutory water management institutions and practices often are poorly implemented at the local level (Tumisang, 2006). Indigenous expectations of the extent to which they can participate in water management are not being met (Jackson, 2008). When compared with other states in Africa, Botswana is the least in recognising indigenous water management rights (Jackson, 2008). Such silence or omissions are the fertile grounds upon which water conflicts

and contradictions in management practices in the Okavango Delta are cultivated. While the Okavango Delta Management Plan (ODMP) acknowledges the inclusion of all stakeholders in the management of natural resources, it fails to explain the role of traditional leadership in water management, specifically their role in water disputes resolution, and enforcement of cultural values of water and allocation. The ODMP stipulates that the Department of Water Affairs is responsible for water resources in terms of supervising, controlling and monitoring aquatic weeds but never in any paragraph mention the role of traditional leadership despite the call at the international level to incorporate traditional leadership in natural resources management (Mogende & Kolawole, 2016).

Another area of contradiction of statutory and customary institutions in the Okavango Delta is what Fink (2000) regards as non-compliance of statutory water institutions and practice to cultural values of its citizens. Several reasons have been posited for this including the water institutions' externality. Institutions are considered ‘external' when they do not conform to the values and standards of the indigenous population (Fink, 2000). Thus, such institutions which outlawed the traditionally viable type of farming in the Okavango Delta are ignored in the communities that traditionally relied on *Molapo* for survival. Similarly, large livestock owners in the Okavango Delta ignore statutory institutions restricting the grazing and watering of their livestock. In both cases, the indigenous people do not think they are committing a crime when they break the law (Fink, 2000) which they think is inappropriate (Jackson, 2008). Thus, this attitude is likely to continue if the harmonisation of customary and statutory institutions is not done. Besides non-compliance, there are also contradictions when it comes to enforcement of institutions in the Okavango Delta. One of the reasons posited for this is that the agencies and authorities obliged to enforce conservation statutory institutions are also obliged to promote the development of natural resources (Sarkin & Cook, 2011), which is like putting the fox in charge of the hen house (Sarkin &Cook, 2011). Indeed, statutory institutions fail to realise the role of

traditional leadership in promoting resources conservation. Statutory institutions thus have stripped off the role of chiefs (Kgosi) and community elders in the enforcement of environmental institutions. This reliance on non-inclusive administrative controls is an area of contradictions that cause conflicts between traditional leadership and the statutory environmental institutions, water institutions and practise in particular. While current Botswana's statutory water institutions depend primarily on criminal sanctions to encourage compliance, they go against customary institutions in the Okavango Delta in which litigations are aimed at reconciliation (Nicole, 2003).

1.7 THEORETICAL FRAMEWORK

1.7.1 INSTITUTIONAL THEORY

In the analysis of contradictions existing between customary and statutory institutions in the governance and management of water resources in the study area, this thesis adopted Frances Cleaver's (2001) institutional bricolage theory, which is an offshoot from the mainstream institutional theory proposed by Elinor Ostrom in 1990. The approach is used to explain the interaction between *bricoleurs* (actors) and institutions focussing on the dynamics of institutional arrangements surrounding natural resources management (in the case of this thesis, water management). Institutional theory is presumed on the notion that common-pool resources (CPRs) are subtractability in nature, that is to say, withdrawal of such resources by one user or a group of users reduces the amount of resource left for other users (Ostrom, 1990). This characteristic feature creates problems in managing such resources as it is difficult to exclude some users of CPRs. Therefore, CPRs often face either overexploitation or depletion if precautionary measures are not taken. To overcome this problem formal institutions are needed to permit, forbid or require certain human behaviour in the use of CPRs (Crawford and Ostrom, 1995; North, 1990; Ostrom, 1990).

There are three perspectives to the institutional theory namely traditional, new and post-institutionalism. The traditional perspective was dominant between the 1960s and 1970s. The main trust of this perspective was on the functioning of formal institutions to curb the depletion of CPRs. The belief of Garret Hardin (its proponent) was that formal institutions can determine the behaviour of individuals through their functioning. He believed that the subtractability problem of CPRs is solved either by privatisation or by state regulations. However, Ostrom (1990) posits that the old institutional perspective disregards the on the ground social interlinkages within institutions. She argued that CPRs can significantly contribute to sustainable resources management because humans can create their mechanisms outside formal institutions to shape their behaviour collectively and desirably. While she acknowledges that some local institutional arrangements do lead to resources depletion, Ostrom proposes eight institutional strengthening principles (Table 4) to ensure sustainable management of CPRs at the local level.

Table 5 Principles of institutional crafting

Principle	Explanation
(i) Boundary	There is a need to be a clearly defined boundary of both resources and users which can be individual or groups.
(ii) Correspondence	The rules have to be adapted to the local situations.
(iii) Participation	The local people need to form part of the group which formulate natural resources management rules in their locality.
(iv) Democracy	The existence of accountable monitoring systems.
(v) Sanctions	When there is no compliance with the rules, different levels of sanctions have to exist.
(vi) Resolution	Resolution mechanisms to be low, local knowledge-based and of easy access.
(vii) Recognition	Local rights management system to be recognised by a decision-making body.
(viii) Nested enterprises.	Need for a coherent condition between the different layers of rights, right holders and the institutions that deal with them.

Source: Adapted from Wong and Gutu (2014:3).

Post institutionalism, which is an emerging perspective to CPRs management, was proposed by Frances Cleaver in 2001. She called it institutional bricolage. It says the conventional understanding of new institutionalism perspectives to natural resources management fails to capture what takes place in realities on the ground as it tends to perceive and promote a homogenous view of the community in which local differences, power and politics are downplayed (Clear, 2002; Wong and Gutu, 2014). Institutional bricolage is the process of patching together institutional arrangements (embracing customary and statutory institutions) in response to changing local and national conditions and is based on the logic of dynamic adaptation (Cleaver, 2001). It is the hybridising, putting together customary and statutory institutions by the bricoleurs. Thus, the bricolage concept as proposed by Cleaver (2001) underscores the aspect of multiple identities of bricoleurs (stakeholders) of cross-cultural origins multiple institutions. The perspective suggests that mechanism for resources management and collective action are borrowed and constructed from existing institutions, styles of thinking and sanctioned social relationships (Cleaver, 2002). Thus, the bricolage perspective, unlike the traditional and new institutionalism, emphasises the importance of social context such as power relations, struggles, processes of negotiations in the definition and enforcement of rules and regulations within communities. Cleaver's (2001) institutional bricolage is based on a socially informed analysis of the context and effects of institutional arrangements at the community level. Cleaver (2002) argues that it is important to understand what constraints or enables people to behave in the way they do within communities and consider such issues when crafting rules for natural resources management at a local level.

This thesis' position is that sustainable, equitable and efficient water resources governance and management in the Okavango Delta, in Botswana and perhaps elsewhere in Africa requires a firm commitment to institutional pluralism. It is hypothesised in the thesis that instead of

embracing statutory institutions as the sole arrangements in controlling behaviour and decisions, the best approach in an environment where the perspectives of the people' experiences diverge is to embrace institutional pluralism. From this vantage point, it is argued in this thesis that while there are statutory institutions that ought to be followed and obeyed by the people in the Okavango Delta, there is also customary institutions that are local and utilises indigenous knowledge which is equally important in the governance and management of water. This is in line with the institutional bricolage theory which acknowledges the existence of more than one institutional arrangement at the local level which can generate and enforce rules. Thus, the adoption of institutional pluralism makes it possible for customary and statutory institutions to be fused in the management and governance of water in the Okavango Delta. The coexistence and interaction in a positive way of customary and statutory institutions in the Okavango Delta will be a steppingstone towards the neutralisation of the contradictions existing between customary and statutory institutions in the governance and management of water resources.

1.8 INTERFACE BETWEEN CUSTOMARY AND STATUTORY INSTITUTIONS

This study proposed institutional (legal) pluralism in normative systems concerning water governance in Okavango Delta. The concept of institutional pluralism was used in this thesis to refer to the coexistence of two different types of water institutions in the specific social context of water resource management. This thesis considered taboos, norms and cultural rules as customary institutions while Water Acts (1968), Water Policy (2012) together with MLMWSS, DWS and WUC are referred to as statutory water institutions. In this study legal pluralism is viewed as the interaction of customary and statutory institutions in the management of water. Such conceptualization of water institutions assists in the understanding of how different legal systems are used in explaining the current decisions and practices of customary and statutory governing institutions in water resources management. This implies that besides statutory institutions, other rules and norms are of importance to water management in the Okavango

Delta. The concepts and ideas which guided this research thus are summarized in the hypothesised schematic diagram in figure 2.

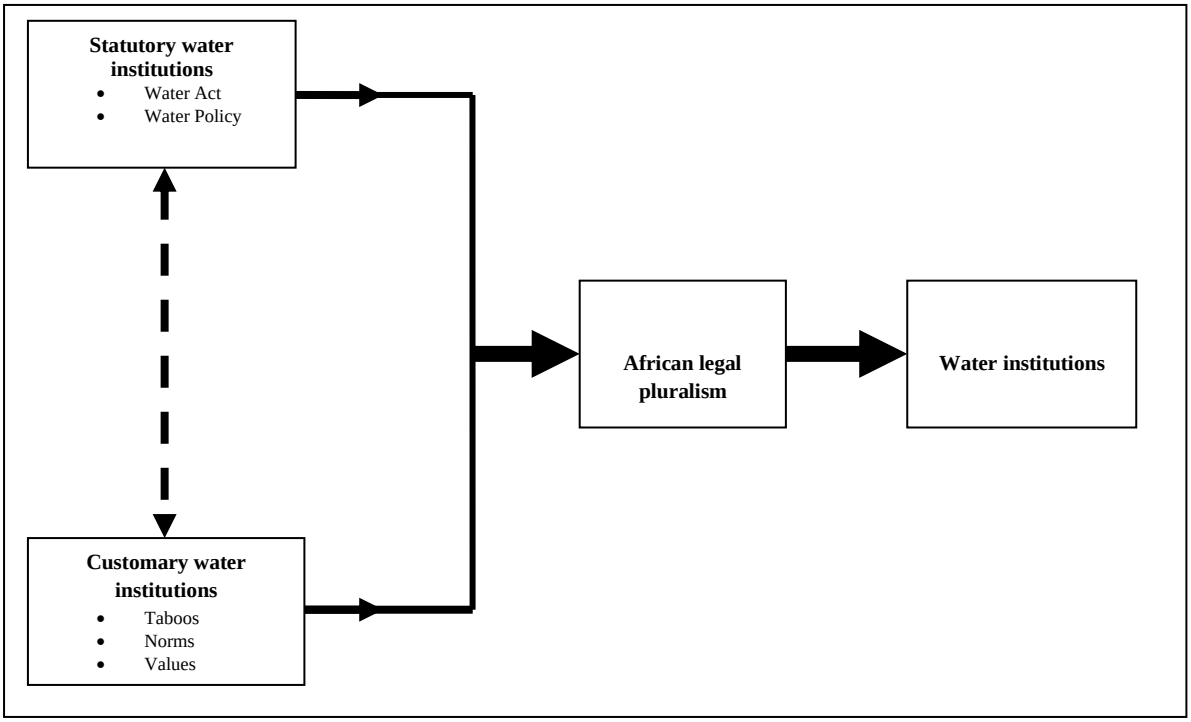

Figure 2: A hypothesised interface between customary and statutory institutions (Source: author)

Figure 2 is a hypothesized scenario in which water institutions apply in the rural areas of the Okavango Delta. It entails that there are two categories of institutions that govern water use from an African point of view. These are customary and statutory institutions. Customary institutions refer to those sets of rules established through the process of socialisation, that are unwritten, acceptable by members of a community and enables community members to distinguish between acceptable from unacceptable behaviour (Craig and Gachenga, 2010; Twikirize, 2005). Water users in Africa, primarily those in rural areas like the indigenous people of Okavango Delta have to abide by the two types of institutions. This implies that people in rural areas, have to ensure that they comply with statutory water institutions and at the same time abide by their customary water institutions. This is the scenario in the Okavango Delta especially in the villages of Shakawe, Tubu and Shorobe.

1.9 RESEARCH DESIGN AND METHODOLOGY

1.9.1 RESEARCH DESIGN

This study adopted both analytical and descriptive cross-sectional design. A cross-sectional design is used for research that collects data on relevant variables one time only from a variety of subjects (Mann, 2003). With this design, data are collected all at the same time, so it provides a snapshot of variables in the study area at one particular point in time (Lewis, 2015; Sulemana, 2013). This was chosen because the general objective of this study was to assess the dissonance in customary and statutory water management institutions and practice with the specific aim of harmonising the two management practices. This approach helped reveal the nature and extent of dissonance between the two institutions and practices that occurred and still occurring in the Okavango Delta with specific reference to three villages of Shakawe, Tubu and Shorobe. The descriptive cross-sectional design, was to a greater extent, assisted in describing the nature and extent of contradictions and conflicts in customary and statutory water management institutions in the Okavango Delta. This design adopted a case study approach. Thus, the case study approach allowed the use of in-depth face to face, informal and key informant interviews as data collection tools in the study area. In this way, the cross-sectional study design is regarded as a snapshot (Lewis, 2015; Sulemana, 2013) of the frequency and characteristics of the dissonance and conflicts of the two water management institutions and practices at a point in time in the Okavango Delta. It is in this vein that a cross-sectional research design was chosen because it is quick, easy and cheap to perform and would allow data collection to be completed within the stipulated timeframe (Sedgwick, 2014).

1.9.2 DESCRIPTION OF THE STUDY AREA

This study was carried out in the Okavango Delta, which is a large inland alluvial wetland delta characterised by a very low level of anthropogenic transformation in the semi-arid north-western Botswana 180- 200 S and 220- 240 E (Masamba & Gondwe, 2015). It covers an area of 22 000 km^2 and is one of the world's largest inland deltas (Gumbricht et al., 2001; Masamba & Gondwe,

2015). The delta's inflow of water is supplied by two rivers namely Cuito and Cubango from the 1300 mm per year summer rains which fall between November and March in the Central Angolan highlands (Gumbricht et al., 2001; Masamba & Gondwe, 2015; Milzow et al., 2009). The Okavango Delta consists of five ethnic groups each with its own identity and language (Bock, 1993). These are BaSarwa, BaYeyi, BaMbukushu, BaTawana and BaHerero (DeMotts et al., 2009). The largest ethnic group are the riverine-oriented BaYeyi (DeMotts et al., 2009), who migrated into the area from Zambia following the expansion of the Lozi Kingdom (Larson, 1971, 1977). The BaYeyi settled on river islands and they brought canoes and fishing nets into the area. BaYeyi generally maintained good relations with the BaSarwa (DeMotts et al., 2009). The HaMbukushu came from Angola due to colonial and civil war in the 1970s. They settled around Etsha villages south of Ikoga. HaMbukushu and BaYeyi lived in spatially separated family units in scattered communities and both were very mobile (Larson, 1977; Kirkels, 1992, Tlou, 2000; Saum, 2006). The pastoral and Setswana-speaking BaTawana and BaHerero migrated from Namibia and introduced cattle in the local area. They arrived in Ngamiland at the end of the 18th century and became the politically dominant ethnic group in the region (Tlou, 2000). Thus, BaSarwa is considered the indigenous people in the Okavango Delta because they are the descendent in the area (Bolaane, 2002).

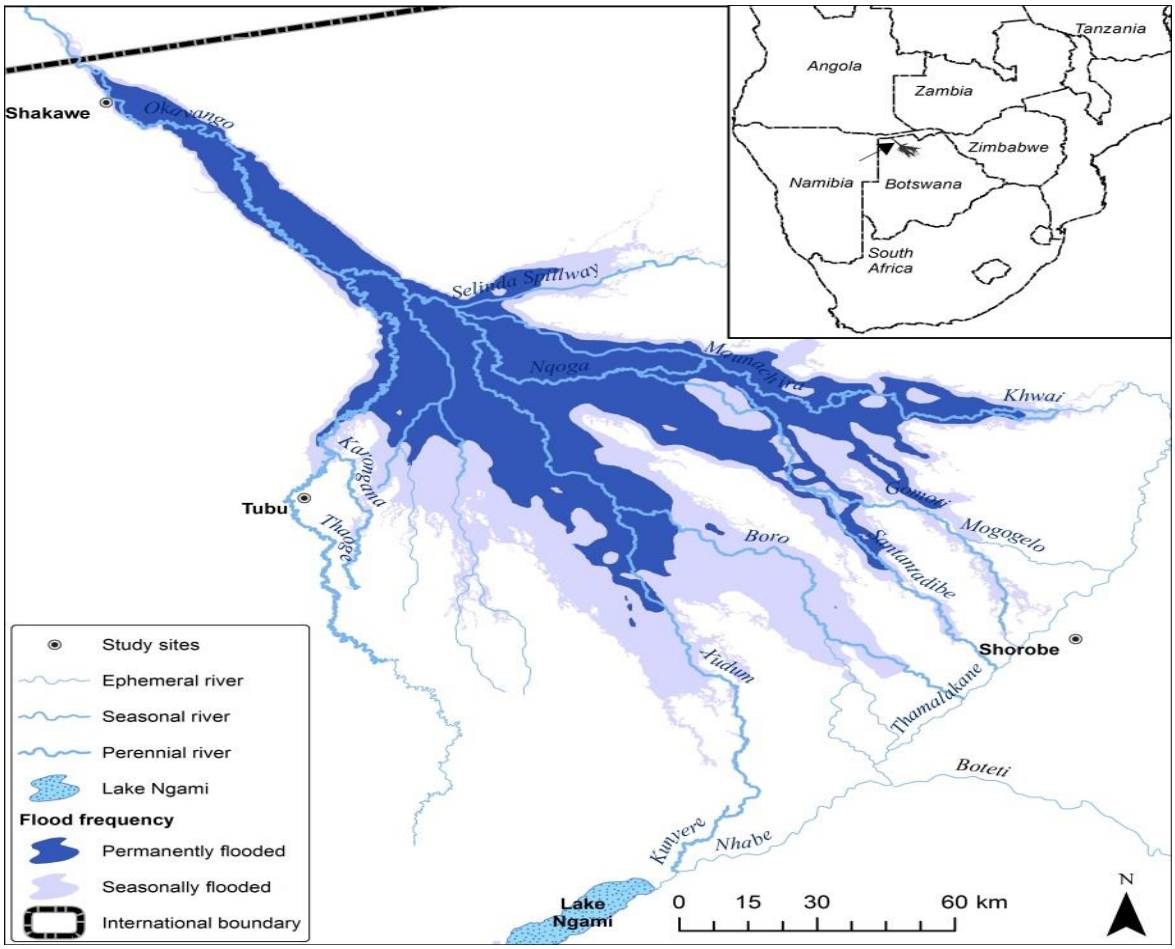

Figure 3: Map of Okavango Delta showing the study sites (Source: ORI, GIS Lab.)

The Okavango Delta is home to a wide variety of wildlife, hence its popularity as a tourist attraction. Among the wild animals found within the delta are elephants, buffaloes, hippopotamus, lions, cheetah, and tsessebe. Since the Okavango Delta is a large area; however, to narrow down the research, I sampled three villages in the panhandle, middle and lower parts of the delta. These villages are Shakawe, Tubu and Shorobe. Generally, these three villages were chosen considering remoteness as well as closeness to water sources as well as the fact that all were rural settlement. A detailed description of each of the three villages is given in the next subsections.

1.9.3 SHAKAWE VILLAGE

Shakawe is located on the upper north-west of Botswana, along the upper panhandle and has a population of 7 426 (Statistical Botswana, 2011). Several ethnic groups are characterising

Shakawe including BaHerero, BaTawana, BaSarwa, BaMbukushu and the BaYeyi who make up the largest percentage (Raletsatsi, 2012). This makes this village the best choice for providing a variety of cultural activities from different ethnic groups. Shakawe is the largest fishing area in Botswana and contributes about 90% of the country's fish production (Ministry of Agriculture, 2010). Other economic activities include livestock and arable agriculture as well as grass and reed collection, all of which are water-related forms of livelihoods. Therefore, the choice of the village was not only done based on its different ethnic groups but also on its remoteness and the water-related forms of livelihoods which make it imperative to harmonise customary and statutory water management institutions and practices to iron out conflicts and contradictions.

1.9 .4 TUBU VILLAGE

Tubu, a village in Ngamiland, was the second of the three villages in which this study was conducted. It is 13 km east of Gumare (Swatuk & Kgomotso, 2007) with a population of 626 (Statistics Botswana, 2011). Water supply to the village is inconsistent (Kgathi *et al*., 2012); hence villagers at times obtain water for domestic use directly from rivers and wells. This made this study an ideal site because by using water from the primary sources there seemed were some taboos and customary rules they observed to conserve and manage water quality. Tubu comprised mainly BaYeyi ethnic group whose livelihoods mainly depended on subsistence farming (Kgathi *et al*., 2012). This entails that traditional water management practices were a common practice hence, the reason for its inclusion in this study.

1.9.5 SHOROBE VILLAGE

Shorobe was the third of the three villages in which the study was conducted. It is situated 30 km in the North East of Maun, with a total population of 1031 (Statistics Botswana, 2011). The main ethnic group in Shorobe is the BaTawana (Turpie *et al*., 2006). The main sources of livelihoods in the village are basket making, dry *Molapo* farming, arable farming, government assistance programme and beer making (Kgathi *et al.,* 2004). Shorobe's proximity to an urban

area (Maun) gives it both rural and urban characteristics hence, making the study of dissonance between customary and statutory water management institutions most ideal. In addition to traditional knowledge of the relatively isolated area, this made it an informed village in terms of customary and statutory water institutions and practices as the village was surrounded by veldt, into which its numerous cattle posts extend and where there was a very suitable area for farming (Turpie *et al*., 2006). Shorobe was chosen as a study area not only because of its closeness to Maun but also because it was a familiar community of a manageable size, making it easier to find help for the research within the community.

1.10 WATER SUPPLY AND TARIFF SITUATION IN THE STUDY AREA

There are several sources of water in Ngamiland and these include standpipes, indoor private pipes, bowsers/tanks, wells, boreholes, rivers and dams (Ngwenya, 2011). However, only rivers, wells, boreholes, private pipes and standpipes (communal) were the common sources of water in the study sites. About 30% of villages in Ngamiland depend on standpipes for domestic water consumption (Kadisa, 2013). Before 2013, all households in the gazetted villages obtained water for domestic purposes from standpipes supplied from boreholes by the District councils (Ngwenya, 2011). It is important to note that before 2013 water from standpipes was not paid for by households (Mazvimavi and Mmopelwa, 2006). A study by Kadisa (2013) reveals that while households depending on standpipes used to get water for free it was difficult for the service supply (WUC) to monitor people who drew water from such stand pipes. The same study reveals that people with private indoor connections would often revert to unpaid standpipes when they failed to settle their bills (Kadisa, 2013). This promoted WUC to introduce a token system for standpipes with effect from 1 January 2013 (Kadisa, 2013). Each household without a private water connection was registered with WUC and given a token. The household credit the token with units for it to access water. BWP20 units are equivalent to 2 207 litres of water (Kadisa, 2013). Tables 6 and 7 indicate tariff structure changes before and after

WUC took over water supply services from DWAs in the study sites and elsewhere in Botswana.

Table 6: Water charges: Prepaid token charges (2013 to 2016)

Description	Consumption Block (M^3/Month	Tariff (BWP/M^3)
	0-5	1.9
	6-20	5.9
	21-40	12.9
(i) Prepaid Token	21-40	12.1
	41+	15
	Minimum charge (Fixed)	10
(ii) DWA charges	0-5	1.9
	6-20	5.9
	21-40	12.1
	41+	15
	Minimum charge (Fixed)	11.2
(iii) WUC	0-5	2.1
	6-15	7.95
	16-25	10.1
	26+	14

Source: Water Utilities Corporation, 2013.

However, upon WUC taking over from DWAs the tariff structure for the areas increased about 11% for the lowest consumption (Kadisa, 2013). The consumption blocks also changed with BWP14.00 for consumption of over 26 M^3 under WUC as compared to 41M^3 under DWA. For the token system, WUC adopted the prices that were used under DWA.

Table 7: Domestic potable water tariffs (2017-date)

Block Tariff category (kl**)	Exc. VAT Revised 1st April 2017 (Pula)	Incl.VAT Revised Tariff 1st April 2017(Pula)
Minimum charge	0	0
(i) 0-5	3.5	3.92
(ii) > 5-15	10.4	11.65
(iii) >15-25	18.2	20.18
(iv) >25-40	28	31.36

(v) > 40	35	39.2

Source: Water Utilities Cooperation Annual Report, 2017. (kl** = Kilolitres = 1000 litres).

1.11 SAMPLING PROCEDURE

The choice of key informants was done using the expert purposive sampling technique where one sample with a purpose in mind in which one has one or more specific predetermined groups one is seeking. In the context of this research, the study targeted three Chiefs (*Kgosi*) (one from each village), three Village Development Leaders, one Department of Water Affairs Official, one Water Utilities Cooperation Official and one Ministry of Land Management, Water and Sanitation Services official. These were thought to be knowledgeable about customary and statutory water management institutions respectively and they could identify areas in which the two categories of institutions contradict each other.

A sampling frame refers to the list of all the population from which a sample is drawn (Lewis, 2015). In this study, the random sample was made up of the listed 2011 census households in three villages of Shakawe, Tubu and Shorobe which was updated to incorporate new households that could have emerged after the 2011 census. Enumeration area (EA) maps for the 2011 national census were used to verify the number and location of all households in each of the villages. The sampling frame was all the households in the three villages which were randomly selected from all the villages in the Okavango Delta. The total number of households in the three villages was 1669. To determine the sample size of households for each village, the number of households of each village was used as the population. Then the total household sample size for each village was calculated using the *Taro Yamane* formula with a 95% confidence level. Substituting in the formula the sample size of households for each village was obtained as Tubu 91, Shorobe 55 and Shakawe 315 and the results are tabulated in Table 1 below. The Taro Yamane formula is shown below:

$$n = \frac{N}{1 + N(e)^2}$$

Where :
n = sample size required
N = number of people in the population
e = allowable error (%)

Table 8: Population and sample size of each village in Okavango Delta

Village	Population	Average Households	Sample Households
Tubu	626	118	91
Shorobe	1031	64	55
Shakawe	8350	1487	315
Total	10007	1669	461

(Source: Statistics Botswana, 2011)

1.11.1 DATA COLLECTION AND ANALYSIS

Three data collection methods were used to achieve the objectives of this study. These included interviews focus group discussions (FGDs) and document reviews. Qualitative data were analysed using thematic analysis. Most of the qualitative data from FGDs and interviews were grouped into themes about similarity and how they addressed the research objectives. Quantitative methods of data analysis were employed to analyse data from interview schedules and questionnaires. Raw data in the numeric form generated through interview schedules and questionnaires were organised into a format suitable for computer analysis to produce frequency tables, graphs (bar and pie) and tables. Statistical Package for Social Sciences (SPSS) otherwise known as Predictive Analytical Software (PASW) was used to analyse the data. Descriptive statistics such as frequency distribution, percentages, a cross-tabulation measure of central tendency (mean, mode, median) and measure of dispersion (standard deviation, variance) were used to summarise the data. For instance, demographic and socio-economic information like age, level of education, gender, and ethnicity were collected and analysed. Furthermore, the study analysed institutional variables (e.g. water pricing, government policy), cultural variables (e.g. water beliefs, religion and conflict resolution) and perceptions of stakeholders on the dissonance between customary and statutory water management institutions. Nonetheless, qualitative data were thematically analysed using content analysis. Inferential statistics used

included the Kruskal Wallis Test, Mann-Whitney U-test and Chi-square linked with cross-tabulation and Analysis of Variance.

1.11.2 DOCUMENT STUDIES

This study made use of secondary data in addition to primary data. The main documents used were the Water Act (1968), Water Bill (2005); Water Policy (2012), Water Management Plan (WMP) (2010) and the BIWRMEP (2013). The Water Act (1968), Water Bill (2005) and Water Policy (2012) form the Republic of Botswana's water institutions while the BIWRMEP and WMP being the major water practices forming modern statutory institutions for water governance. Thus, they were chosen to fulfil the statutory water management institutions and practices which contradict the customary water management institutions and practices in the Okavango Delta in Botswana. Journal articles on the interface between statutory and customary water management were used. These documents were used to have background information about the dissonance between customary and statutory water management institutions. Water use tariffs, water allocation responsibilities, charges for none compliance, conflict resolution mechanisms and an interface between customary and statutory water management institutions were some of the data derived from documentary records.

1.11.3 ETHICS

By the Botswana Anthropological Research Act (1967) all studies involving the use of human subjects need to be permitted and registered by the government (Motsholapheko, 2015). Since this research involved chiefs, heads of households and officials from DWA, and WUC, a research permit was sought from the Ministry of Land Management, Water and Sanitation Services. A research permit was sought after clearance from other government departments. When the research permit was obtained, I then informed the residents of Shakawe, Tubu and Shorobe about the objectives of the study. Thus, respondents in the villages were not under any pressure to participate in the study; they had the right to opt-out at any stage of the study.

Furthermore, since respondents had a right to privacy, the researcher treated every kind of information collected with the highest level of confidentiality it deserved. Inappropriate use of information is unethical and was avoided in this research. The information collected was only used for this research and nothing else. Lastly, the principal investigator (PI) and other researchers guarded against any prejudice or bias as it is unethical to do so.

1.12 SIGNIFICANCE OF THE STUDY

Various stakeholders in the Okavango Delta derive their livelihoods from tourism and agriculture, all of which are water-dependent to varying degrees. It can be expected that these various groups have different perceptions and appreciations of water and value towards improving their livelihoods which incorporate some elements of customary experiences. These customary water management practices are often informed by ethnicity and therefore tend to vary across different ethnic groups (Latham and Chikozho, 2004; Twikirize, 2005; Sarpong 2005; Nkonya, 2006; Craig & Gachenga, 2010), Thus, the study identified water management practices in different ethnic groups in the Okavango Delta, a move which not only enriched the water management knowledge base but assists in ironing out dissonance in water management practices.

The study assisted in the evaluation and appreciation of customary water management practices which will assist in the harmonisation of customary and statutory water management institutions to iron out contradictions. The study will assist in stakeholders' appreciation of customary water management institutions and practices at a national level in Botswana. The information derived from the study will contribute to an invaluable knowledge base for water policy reviews in Botswana and a greater extent assist in the formulation of water conservation particularly about customary management practices in future. The information acquired will be used to work towards all-embracing institutions which encompass traditional and statutory management practices in Botswana as a whole. This harmonisation of water management practices in the

Okavango Delta will to a greater extent fulfil the consensus at the United Nations Conference on Environment and Development (UNCED) of 1992 which suggests that the implementation of what is ‘sustainable development' should be based on local level solutions derived from rural initiatives (Sichone, 2007). The study will inform policy an additional theoretical knowledge base that is already available on Botswana‘s water conservation.

1.13 LIMITATIONS OF THE STUDY

The following were the possible limitations of the study:

1.13.1 Response error

The reported information could differ from the actual information that could have been obtained. This could be due to some respondents failing to answer questions correctly either intentionally or due to a lack of complete knowledge. They could also be compelled to lie when they didn't want to give the true answer.

1.13.2 Non-response error

This could have occurred when the target participants did not participate. This could have also occurred due to failure to access the participant or failure in making them want to participate.

1.13.3 Spatiotemporal limitations

The study focused only on three villages of Shakawe, Tubu and Shorobe which is just a very insignificant ratio of the total number of the villages within the Okavango Delta. Thus, the study only focused on the perceptions of 455 households in three villages whereas different indigenous communities have their unique water management strategies which are context specific. Since the data was collected at one single point in time (cross-section) it is difficult to measure changes in perceptions of people over time whereas dissonance in customary and statutory institutions vary in intensity and gravity over time. This affects the generalizability of the data.

1.13.4 Participant perceptions

The respondents could have been compelled to respond differently on the pretext that they were being studied. The respondent could have given answers that they thought the interviewer would want to hear based on their perceptions of dissonance in customary and statutory water management institutions. In that way, the respondents could have given inaccurate responses or act falsely. Also, the Data collection methods used were very expensive. Time for data collection was limited as the researcher wanted to complete the study within four years. The researcher was not able to speak the local language.

1.13.5 STRUCTURE OF THE THESIS

This thesis has eight chapters, with chapter one being the introduction, while chapters two to seven are data chapters, with chapter eight being a synthesis. Some of the data chapters have been published by different journals and the remaining chapters have been submitted to different journals for peer review. The outline of the different chapters is given below:

Chapter 2: Sustainable water resources management: Issues and principles of water governance in the Okavango Delta, Botswana.

This Chapter was published in the *International Journal of Rural Management* (SAGE) and its main thrust was to analyse demographic and socio-economic factors influencing the dissonance existing between customary and statutory water management institutions and practices in the Okavango Delta. The chapter examined the key principles of and issues in water governance in the Okavango Delta from a literature review perspective, the chapter begins by outlining the theoretical underpinnings of sustainable water governance [section 2]. While the third section of the chapter addresses pertinent information on the Okavango Delta, section 4 highlights the methodological approach adopted by the paper. Section 5 of this chapter outlines the principles of sustainable water management as enshrined in Integrated Water Resources Management (IWRM). While section 6 discusses the meaning of water as an economic good, section 7 sheds light on statutory water management institutions in Botswana. Section 8 identifies the factors

influencing water demand in the Okavango Delta in general. Lastly, the concluding section of the chapter provides a summary of the pertinent issues in the chapter.

Chapter 3: Demographic and socio-economic factors influencing water governance at the household level in the Okavango Delta, Botswana

The chapter was submitted to the *African Scientific Journal* (Elsevier). The main objective of the chapter was to analyse demographic and socio-economic factors influencing the dissonance existing between customary and statutory water management institutions and practices in the Okavango Delta; and the sub-objectives were to (i) assess the impact of gender, age and level of education on water consumption at household level; (ii) examine the impact of price and income on household water consumption and (iii) assess how household size, religion, and ethnicity influencing water management at household level in the Okavango Delta in Botswana. The chapter begins by providing the theoretical underpinning decision making on water resource management at the household level and then highlights the methodological approach of the paper. Section 4 of the chapter outlines the results of the study and section 5 gives concluding remarks on the need for understanding the demographic and socio-economic variables which influence water consumption at the household level in the Okavango Delta.

Chapter 4: Dissonance in customary and statutory water management institutions: issues of cultural diversity in the management of water resources in the Okavango Delta, Botswana

This chapter was published in the *Environment, Development and Sustainability journal* (Springer). The objective of the chapter was to examine cultural factors influencing dissonance existing between customary and statutory water management institutions and practice in the Okavango Delta. The chapter highlighted cultural factors engendering dissonance between customary and statutory water management institutions from a global to a local (Okavango Delta) context. The main thrust of the chapter was on how culture influences the conflict between customary and statutory water institutions. It also discussed conflict resolution

mechanisms for water access as well as challenges as done in the olden days within the Okavango Delta and elsewhere.

Chapter 5: Institutions and water governance in the Okavango Delta, Botswana

This chapter was published in the *Chinese Journal of Population Resources and Environment* (Taylor & Francis) and the objective was to analyse institutional related factors engendering the dissonance existing between customary and statutory water management institutions in the Okavango Delta. The chapter began by highlighting the conceptual framework including institutions and water governance structures in the Okavango Delta. The chapter addresses the distinction between water governance and management as well as water sector reforms in the Okavango Delta. Issues of water as a social or economic good and the impact of treating water as such from customary and statutory institutions point of views also engaged in.

Chapter 6: Institutional factors engendering dissonance between customary and statutory institutions in water access in the Okavango Delta, Botswana

The chapter was submitted to the *Water Resources Management Journal* (Springer). The chapter's objective was to analyses customary and statutory institutional factors engendering the dissonance between customary and statutory water management institutions in water access in the Okavango Delta, Botswana. The chapter noted income as a barrier to access quality water as most people could not afford connection fees or drilling boreholes at their homestead. Also highlighted in this chapter is the fact that women were dominantly responsible for fetching water for domestic use in the households, a point which buttresses the claim in the literature that the dominant water providers in rural areas are women and children particularly girls. The chapter has also highlighted that the belief in the Okavango Delta was that water for cultural rituals is purportedly not obtained from ordinary sources but from certain sources that are deemed sacred. The chapter has emphasised various belief systems about water in the area. Of importance is the fact that there were taboos that were observed in the management and governance of water. It has been shown in this chapter as well that there were some water points

within the Okavango Delta which were restricted entry and such sources were protected by traditional codes of access to maintain their sanctity. On treating water as an economic good in which people have to pay to access it, the consensus was that water is a God-given commodity in which everyone has to access free of charge. The chapter has also demonstrated that in the Okavango Delta, water had two prominent meanings namely a gift from God and an embodiment of spirits. The first conception of water in the study area is loaded with several meanings for people in the Okavango Delta. Whereas on one side if we assume water having perfection which comes from God, the inherent belief is that anything associated with God is perfect. Thus, people were compelled to draw water from even unprotected sources.

Chapter 7: Stakeholder's perceptions on water resources management in the Okavango Delta, Botswana.

This chapter was published in the *Transactions of the Royal Society of South Africa* Journal (Taylor & Francis). The objective of the chapter was to assess stakeholders' perceptions of the management of water through customary and statutory institutions in the Okavango Delta. The main focus was on the beliefs, values and norms of key stakeholders concerning water management. The chapter found that water use varies with gender however, people had similar viewpoints despite having different religious, educational and age differences. Thus, the chapter demonstrated that education had no influence on cultural issues in water management. The key issues highlighted in the chapter are people's belief that water is therapeutic, is life and therefore certain water sources within the Okavango Delta were perceived as sacred.

Chapter 8: A synthesis

This is the concluding chapter which synthesises the findings of the study as well as the literature reviewed. This chapter also includes the conclusion, policy recommendations and suggestions for future research.

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Part II

Results chapters

Chapter 2

Sustainable Water Resources Management: Issues and Principles of Water Governance in the Okavango Delta, Botswana

Article

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Abstract

In the recent times, there is an increased awareness about the importance of water management as population growth, new technologies, increased food consumption, land use and economic activities, among others, continue to exacerbate competition among water users in their bid to access natural resources. Thus, water governance encompasses the allocation and management of aquatic resources within the context of a multilayered, competing demand for water resources. Employing a critical review of relevant literature and guided by the legal pluralism conceptual framework and situated within the Dublin water management principles, this article examines key principles and pertinent issues in sustainable water resources management in the Okavango Delta, Botswana; the delta is widely recognized as a wetland of international significance. Findings reveal that demographic and socio-economic factors such as age, education, religion, culture, gender and income play significant roles in household water management decision making. The results also show that although the water legislative environment in Botswana is characterized by outdated Water Acts, efforts and commitment from the government are underway to revise these Acts. This article argues that whilst water research scholars and policymakers continue to make advocacy for water governance at different levels, the local-level water governance needs to be accorded more priority in rural areas in Botswana.

Keywords

Economic growth, governance, multifaceted, rural, sustainable, tenets, water

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Introduction

The article addresses issues and principles of water governance in the Okavango Delta. It employs a literature review and case study approach to analyse data on water management in relation to the Okavango Delta in Botswana. Effective water resources governance is partly responsible for socio-economic growth and poverty reduction. The debate around culture and development has been stimulated by a growing awareness that water development programmes fail to consider the cultural environment and other related factors influencing their sustainability (Jackson 2006). Indeed, cultural rights and the recognition that people's cultural identity, beliefs and values can be a powerful ally as well as a barrier to development or poverty reduction (Head, Trigger and Mulcock 2005) are other important dimensions to the subject. Globally, water plays a central role in many religions and belief systems. Communities and indigenous people have assigned religious and cultural values to water for generations (Anderson and Gale 1992; Mitchell 1995). It is a key element in cultural ceremonies and religious rites. Many rural communities are linked to water for both physical and spiritual health (Head, Trigger and Mulcock 2005). Traditional water governance practices often reflect these socially determined norms for water allocation and sustainable practices. This phenomenon is not unique to the Okavango Delta in north-western Botswana but has been observed throughout human history (see Yan 2016, 170).

Rogers and Hall (2003) define water governance as encompassing all the political, social, economic and administrative systems put in place to develop and manage water resources as well as deliver water services at different levels of the society. It is about how government and other social organizations within a country interact and relate to the citizens and make decisions on water management. It is also about the frameworks upon which water policies define who gets power and how accountability for such power in water management is rendered. The Botswana Water Act (1968) and Water Policy (2012), in theory, promote equitable, efficient and social use of the country's water resources. However, there is still very limited understanding on the use of water for cultural and religious activities and the value(s) attached to these uses, and the way these affect water management decisions especially in the Okavango Delta (Stanley 2014). Recognizing cultural and religious activities of communities can be a powerful driver for social or economic growth and may engender a sense of cultural identity and self-confidence, all of which have a positive impact on the development and/or well-being of a community. Water represents many values to society, and it contributes to a complex system of services (Head, Trigger and Mulcock 2005). Social services provided by water include water for basic human need (Larson 1989). Each of these services should be understood and valued differently, where necessary. Understanding the complex totality of these values is an important element in Integrated Water Resources Management (IWRM). Likewise identifying the way specific values, attitudes, beliefs and practices affect state and water governance strategies is obviously very useful (Yan 2016).

Sustainable development issues currently prioritize poverty reduction, health and gender as urgent issues (Gumbo and van der Zaag 2002). However, sustainable

development using water for social and economic development is about ensuring not only that people have access to water and sanitation but that they have a good quality of life where their cultures and values are respected and enhanced (Jepson and Canney 2003). Hence, cultural values and beliefs also directly affect the institutions involved in water governance. The principles of IWRM are key for sustainable development (Gumbo and van der Zaag 2002). Within the framework of water resource management, the integration of cultural values in a water governance framework is necessary for the conservation of water resources (McIntyre-Tamwoy 2004).

However, the cultural uses of water are poorly understood in the Okavango Delta context (Toteng 2008). To bridge the information gap, this article provides a brief synthesis of the common demographic, economic and social issues and principles in sustainable water governance focussing on the Okavango Delta, Botswana. Having a major thrust of examining the key principles of and issues in water governance in the Okavango Delta, the article begins by outlining the theoretical underpinnings of sustainable water governance (the Theoretical Underpinnings section). While the third section addresses pertinent information on the Okavango Delta, the fourth section highlights the methodological approach adopted by the paper. The fifth section outlines the principles in sustainable water management as enshrined in IWRM. While the sixth section discusses the meaning of water as an economic good, the seventh section sheds light on statutory water management institutions in Botswana. The eight section identifies the factors influencing water demand in the Okavango Delta in general. Lastly, the concluding section provides a summary of pertinent issues provided in the article.

Theoretical Underpinnings

The thrust of this article is rooted in the legal pluralism theoretical framework conceived by Barry Hooker (1975) and Vanderlinden (1989) who opined that legal pluralism is a state of affair in which more than one legal systems operate in a single political unit. It is accordingly regarded in the context of this study as the coexistence of two or more different types of water institutions in the specific social context of water resource governance. Such conceptualization assists in understanding how traditional and modern institutions are fused in the governance of water resources. While legal pluralism is a practical reality in a number of countries; however, it is most notable in the post-colonial states of Africa (Pimentel 2011). Like many post-colonial states, Botswana formally recognizes customary institutions, and like almost all of them, she has a constitution with Bill of Rights which incorporates customary institutions. The definition of institutions is understood from Tiede's (2018) perspective where it refers to both formal and informal rules, laws, as well as organizations. The term customary institutions in this article denote both unwritten rules, norms and values on water governance and the organizations such as traditional courts (*kgotla*) together with traditional governance structures like the Chief and Village Development Committees. On the other hand, statutory institutions refer to written legislation, policy and management

strategies for water governance. Accordingly, Botswana Water Act (1968), Water Bill (2005), Water Policy (2012) and Water management strategies (2013) form statutory institutions and they also include water supply and management organizations such as Water Utilities Cooperation (WUC), Department of Water Affairs (DWAs) and Ministry of Land management, Water and sanitation services (see Gondo et al. 2018a).

Legal pluralism theoretical framework as applied to this study entails that the state recognizes different water governance institutions as well as dispute resolution systems that co-exist in the Okavango Delta insofar as they are not contrary to the fundamental principles and values of the constitution. The motive for embracing legal pluralism emanate from the fact that large population in former colonies have limited access to urban areas where statutory institutions are situated (Obani and Gupta 2014). Even if they can get to the city, few can afford the legal representation or legal advice that may be necessary to navigate the statutory water governance practice system (Gondo and Kolawole 2019). Thus, unless indegenes can get their water disputes and issues resolved locally, their water claims and issues are unlikely to be heard. Furthermore, the most compelling reason to embrace and pursue legal pluralism in the governance of water resources in the Okavango Delta and elsewhere is to preserve and respect the cultural traditions of the indigenous people which were devalued by the adoption of foreign models of water governance (Pimentel 2011). Literature has shown that most African states are grappling with how to preserve the cultural heritage reflected in their customary institutions (Cantwell 2015; Gondo et al. 2018b; Pimentel 2011; Tomaselli 2003). Despite the challenges, nevertheless, the best approach for the former colonized African countries is to maximize the role and independence of customary institutions in the governance of water through emphasizing legal pluralism. Consequently, this buttress Cantwell's (2015) point of view that a balance has to be struck between customary and statutory institutions in water governance to ensure that human rights to water are not unduly compromised. Such a balance will require a procedure by which both customary and statutory institutional decisions are respected. This view can be accomplished by adopting legal pluralism and without giving statutory institutions the absolute power in the governance of water resources in the Okavango Delta or elsewhere.

The Okavango Delta

The Okavango Delta is a large flood-pulsed alluvial wetland (See Figure 1) (Mendelsohn et al. 2010). It is characterized by very low level of anthropogenic transformation in the semi-arid north-western Botswana (Gondwe and Masamba 2014). The delta is located within 18°–20° East of the Greenwich Meridian and 22°–24° South of the Equator (Gondwe and Masamba 2014). It covers an area of 22,000 km^2 (Gondwe and Masamba 2014) and is the largest Ramsar Site in the world, having been designated as Botswana's first Wetland of international importance in 1997 (Mendelsohn et al. 2010). It is hydrologically unique and is the largest inland delta in sub-Saharan Africa after the inner delta of Niger

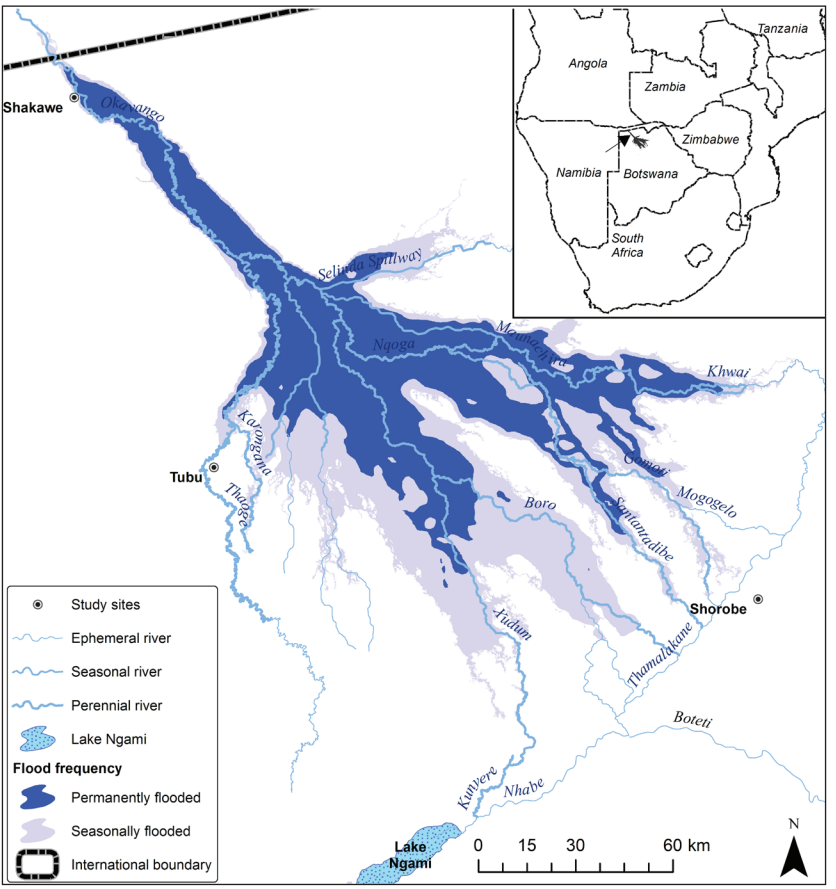

Figure 1. Map of the Okavango Delta Showing the Sampled Sites
Source: Okavango Research Institute GIS Laboratory.

(Mbaiwa 2005). The Okavango Delta was listed as the 1,000th World Heritage Site on the World Heritage List (Magole 2008), and it attracts a huge number of international tourists annually. The delta sustains the populations of some of the planet's most threatened mammals such as cheetahs, rhinoceros, wild dogs and lions. It is also home to 24 species of globally threatened birds and is key to the survival of Botswana's 130,000 elephants (Elephants Without Borders). There are five ethnic groups in the Okavango Delta, each with its own ethnic identity and language (Mbaiwa and Stronza 2010). They are the HamBukushu, BaTawana, BaYeyi, BaKalanga and BaKgalagadi. The HamBukushu, BaTawana and BaYeyi traditionally engage in mixed economies of subsistence agriculture, hunting and collection of wild fruit (Bock and Johnson 2004; Segadika 2006). On the other hand, the BaKalanga and BaKgalagadi engage in fishing, hunting and the collection of wild fruits. BaKgalagadi people utilize both forest and mineral resources.

Review Methodology

This article adopted a literature review and case study approach to analyse the principles and issues in sustainable water governance in the Okavango Delta. A case study is a research strategy and an empirical inquiry that investigates a phenomenon within its real-life which helps in contributing to knowledge by allowing an understanding of complex individual social phenomenon (Yin 1984). Consequently, a case study approach was adopted in this study to understand the principles and issues in sustainable water governance in the Okavango Delta. Therefore, to provide an in-depth scrutiny and insights into the governance of water resources in the Okavango Delta, a case study approach was used by engaging in literature and document analysis. Document analysis is a methodical technique for studying or evaluating both electronic and printed documents (Bowen 2009). By using an inductive process, we accessed papers on Google scholar using keywords, 'sustainable water resources', 'water as an economic good', 'water governance', 'water demand issues' and 'principles of IWRM'. The papers chosen were those that comprised, to a greater extent, an analysis of principles and issues in water governance. From these research papers, common themes were derived as they related to sustainable water governance. In this study, data were explored and examined using various themes related to the principles and issues in sustainable water governance. Assigning meaning as well as providing a broader understanding of the sustainable water resources governance is an essential component in the analysis of this article.

Principles in Sustainable Water Management

The current thinking on the crucial strategic issues in water governance is heavily influenced by the Dublin Principles (Gumbo and van der Zaag 2002). In preparation for the United Nation Conference on Environment and Development in Rio de Janeiro in 1992, the Dublin principles were formulated during the International Conference on water and Environment in Dublin (Ireland) the same year. Thus, the concept IWRM was coined and four principles for sustainable water management were put forward during the Rio summit (see Table 1).

Table 1. Dublin Principles Underlying IWRM

- Freshwater is finite, vulnerable and essential resource which should be managed in an integrated manner.
- Water resources development and management should be based on a participatory approach involving all relevant stakeholders.
- Women play a central role in the provision, management and safeguarding of water
- Water has an economic value and should be recognized as an economic good, taking into account affordability and equity criteria.

Source: Gumbo and Van der Zaag (2002).

Given the scope of these four principles, IWRM implies an inter-sectoral approach (Biswas 2004), representing all institutions and considering the sustainability of the physical environment (Gumbo and van der Zaag 2001). The main issues emanating from the principles include water allocation which prioritizes the basic human needs while other water uses are prioritized in accordance with societal needs and socio-economic criteria (Poff et al. 2016). Of importance also is the participatory approach in decision-making and the role of gender in water management. In summary, Principle 1 calls for a holistic approach to water governance which recognizes all the characteristics of the hydrological cycle and its interaction with other natural resources and ecosystems. The principle also recognizes that water is required for many different purposes, functions and services. Holistic management, therefore, involves consideration of the demands placed on a natural resource by different institutions (Pahl-Wostl et al. 2007). This principle also emphasizes the need for a holistic institutional approach to water management which involves the management of natural systems and coordinating them with a range of human activities (Mitchell 2005). In this regard, creating water-sensitive political economy requires coordinating policymaking at all levels of community and relevant government concerns.

Principle 2 places emphasis on the need to recognize water as a commodity in which everyone has a stake. Indeed, real participation only takes place when all institutions are part of the decision-making process (Biswas 2008). This can occur directly when local communities come together to make decisions on water supply management and use choices. Furthermore, participation requires that institutions at all levels or the social structures have an impact on decision at different levels of water governance. While Principle 2 on the one hand underscores the participation of all institutions, Principle 3 on the other hand is concerned with the involvement of women in decision-making, which is interwoven with gender hierarchies and roles within different cultures. The fourth Dublin Principle posits that water is an economic good having monetary value attached to it. Many failures witnessed in water resources management programmes in the past are attributable to the fact that the resource has been and is still viewed as a free good or at least, that the full value of water has not been recognized (Gumbo and van der Zaag 2002; Petit and Baron 2009). However, the issue which emanates from this principle is that of value. In literature, the word value has two different meanings (Hanemann 2000). According to Ostrom (2003), the word value sometimes expresses the utility of a commodity and at times the power of purchasing other goods which the possession of that good conveys. Thus, the former is called the *value in use* and the latter *value in exchange* (Hanemann 2000). One very important relationship is that the commodities which have the greatest *value in use* have frequently little or no *value in exchange.* Contrary-wise, those which have the greatest *value in exchange* have frequently little or no *value in use* (Hanemann 2000; Savenije and van der Zaag 2002). Nothing is more useful than water but nothing as well can be obtained from exchanging it with other commodities (Hanemann 2000). A diamond, for instance, has no value in use but very great quantity of other goods can be obtained in exchange for it (Hanemann 2000). Thus, the value of water

in traditional societies is not in its exchange but its utility stemming from its relation to the divine spirit, which is determined by an inner goodness (intrinsic value) (Savenije and van der Zaag 2002). As such, the crucial issue in the fourth principle is that in a situation of competition for scarce water resources like in the Okavango Delta, water may not be ascribed low value uses which statutory institutions as the dominant institutions perceive as having a limited economic value. While this article recognizes that water has an economic value, it also emphasizes the need to change the perceptions about the value of water and recognize the opportunity costs involved in current allocative pattern as well as recognize the intrinsic value of water in traditional societies most especially in the Okavango Delta. The word principle is differently interpreted. It is sometimes used as a synonym for rules which do not have to be enforced by law (von Bar et al. 2009) and at times used to refer to a fundamental truth which serves as the foundation for a system of belief or behaviour (Graham, Amos, and Plumptre 2003). In this study, the word principle refers to rules of a more general nature in the governance of water resources.

Water as an Economic Good

This section starts by defining and explaining the meaning of water as an economic good and highlights some controversy over the concept. It then concludes by using the general principles for cost and value of water as proposed by Rogers et al. (1997) to make a justification for the pricing of portable and non-portable water. To define water as an economic good would mean that it is a resource whose price is charged against its value and whose allocation can be improved through integrated decision making (Rutherford 2001). On the other hand, McNeill (1998) defines water as a scarce resource for which there are competing demands, which outweigh its supply. Grimble (1999) regards an economic good as a scarce good, yielding utility which must be allocated either by rationing or by the price mechanism but not a free good. In principle, regarding water as an economic good appears reasonable for two main reasons (Rutherford 2001; Yuling and Lein 2010). Firstly, it is a means to secure efficient use of water, and secondly, it offers a basis for cost recovery. The efficient argument is based on a simple but powerful narrative that since water is often a low-priced resource, it is wasted due to inefficient use and over usage (Yuling and Lein 2010), leading to water shortages and potentially water crises. The best way to rectify this potentially precarious scenario is to ensure that the cost or pricing is rightly and optimally determined (Rutherford 2001), which according to economists would ensure an efficient means to optimize water use within agriculture as well as across sectors.

However, the Dublin Principle 4 is rather vague and ignites some controversial issues. While some authors (e.g. Gleick 1998; Grimble 1999; Petrella 2001; Yuling and Lein 2010) believe water differs from other resources due to its non-substitutability and hence it should be treated as a basic right rather than a commodity, others (McNeil 1998; Savenije and van der Zaag 2002) argue that water is

by nature an economic good, thereby making its allocation to become necessary. But then, there is a disagreement as to what this really implies. It is on this premise that the idea of a competitive market-based water pricing (to secure optimal water allocation) emerged. However, while the economic value of water is incontestable, it needs not be treated like an everyday economic good as it has many characteristics which distinguish it from a normal economic good. Such water features include its being scarce, fugitive, non-substitutable, not freely tradable and complex (Grimble 1999; Savenije and van der Zaag 2002).

This subsection uses the general principles for water costing and valuing as proposed by Rogers et al. (1997) to explain its meaning as an economic good. In the model presented in Figure 2, Rogers et al. (1997) classify water costs into different categories, namely the full supply cost, which include the financial costs related to the production of water and these consists of the operation and maintenance (O & M) costs and the costs of investments in the infrastructure for water supply (capital charges). This is followed by the full economic cost, which in addition includes the opportunity cost (i.e. the cost of depriving the next best user of water) and the economic externalities (i.e. the damage incurred by the other institutions that is not considered) and the full cost, which includes the environmental externalities (environmental damage). While the value of water to the user may be quantified in terms of their willingness to pay, there are additional benefits such as return flows and multiplier effects from indirect uses and in a broader sense the benefits to meeting societal objectives. For instance, the societal objective could be to reduce poverty. The local community, in that context, might be exempted from, or made to pay, highly subsidized portable water bills or the objective could be to reduce food insecurity. It is, therefore, reflected in the reduction or subsidies in the local farmers' irrigation water bills from abstracting water from its source. Such adjustments to meet the societal objectives are over

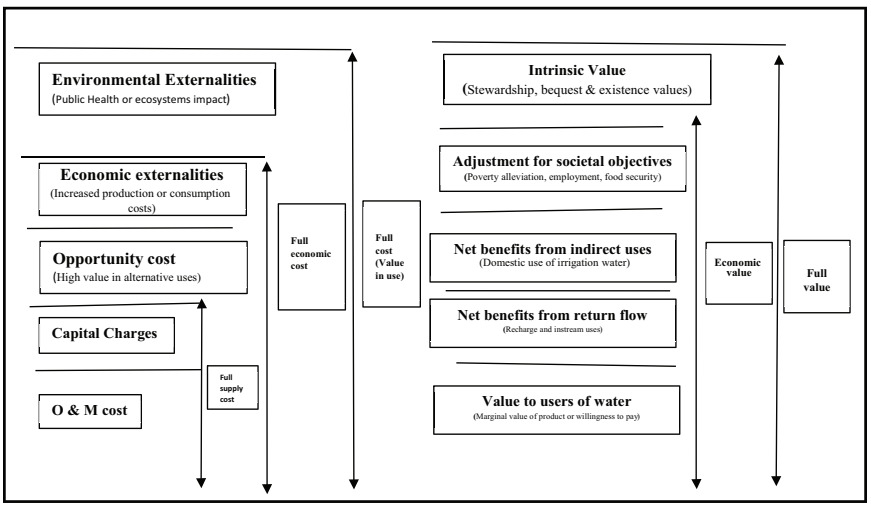

Figure 2. General Principles for Water Costing and Valuation
Source: Rogers et al. (1997).

and above the value of water to the user and should be added to reflect various societal objectives. This aspect is usually neglected by water managers when setting water prices because it is difficult to quantify in monetary terms (Savenije and van der Zaag 2002), even though it is essential to integrate it into water supply decision-making process. As reflected in Figure 2, the intrinsic value of water consists of cultural, aesthetic and merit values. These are also very difficult to quantity in monetary terms (Savenije and van der Zaag 2002). In this case, the full value of water encompasses the full cost and full value of water. Thus, water as an economic good is interpreted to mean that the process of integrated decision making on the allocation of scarce resources, which does not necessarily involve financial transactions but making the right choices about the allocation and use of water resources, is based on an integrated analysis of all the advantages and disadvantages of alternative options (Green 2000).

Statutory Water Management Institutions in Botswana

The institutional landscape for statutory water resources management in Botswana has changed and is still changing since the Water Act (1968). The review of the Water Act (1968) in 2005 resulted in the publication of the Water Management Master Plan (2010) and the Water Policy (2012) documents. Unlike the Water Act (1968), the Water Bill (2005) focusses more on a decentralized participatory government model to redress the disparities in the water sector (DWA 2013). This section of the article provides a review of statutory water management institutions in Botswana. The section gives a summary of statutory water management institutions, mainly the Water Act (1968), Water Bill (2005) and Water Policy (2012).

Botswana water-related Acts includes Borehole Act (1956), Water Works Act (1962), Water Act (1968) and Water Utilities Corporation Act (1970) which are over 49 years old and thus are outdated (DWA 2013). While the legislative instruments are not consistent with current world water sector trends or the existing developments in Botswana, there is a commitment on the part of the government to try to ensure that the institutions are in line with global water trends. And while efforts have been put in place to review these Acts as indicated by the Water Bill (2005), the speed at which the process has moved needs to be re-examined with a view to allowing current issues to be captured in the water sector.

The key features of the Water Bill (2005) include the abolition of the common law riparian rights which attach water rights to land. In the draft Water Bill (2005), no owner or occupier of any land shall, by any reason, therefore, have any right that is enforceable against the Government or any other person (DWA 2005). Another key feature of the draft Water Bill (2005) is the creation of Village Water Development Committees (VWDC). The bill suggests the formation of the VWDC for any village in Botswana. This is a welcome development, especially in rural areas of the Okavango Delta. Once they are formed, it would mean that these villages would, to some extent, incorporate their customary institutions in water governance. As the VWDC would now have the responsibility to advise village residents on the protection, use, development, conservation, management

and control of water resources in the village, it implies that the customary institutions will be a part of water management in rural areas.

Following the draft Water Bill (2005), a new Water Policy (2012) was promulgated in 2016 having been in draft form since 2005. The new National Water Policy (2012) provides a framework that foster access to good quality water by all users (DWA 2013). The policy is formulated on the core principles of sustainable development, and it embraces the principles of IWRM. The policy adopts a decentralized catchment area approach and uses the precautionary principle stating that '[w]e have sufficient scientific evidence to state that action is required. And where uncertainty still exists we must give the environment the benefit of the doubt' (Cameron and Abouchar 1991). The overarching guiding principles as enshrined in the National Water Policy (2012) are equity, efficiency and environmental sustainability. The Water Policy (2012) recognizes the importance of water for basic needs, and water allocation for such needs receive priority. A second priority in water allocation is given to the environment as it is the pillar for economic growth and social development and social equity as well as commercial uses. The gender and social equity components are also supported by the policy (DWA 2013). The policy also recognizes water as an economic good, hence costing and pricing of water resources pay a considerable attention to its economic value. The last of the three principles of the National Water Policy (2012) is the sustainability principle. This principle emphasizes the fact that water is a finite and vulnerable resources, and as such, it is an essential resource to sustain the lives of the Batswana. It is also emphasized in the policy that water has a value as an environmental allocation, and in this way, its governance and planning require all institutions to be on board, including the local community (DWA 2013). Though it is still to be formulated, the policy seeks to establish a Water Resources Board with the responsibility of equity and sustainable allocation of water resources, as well as the effective implementation of the IWRM plan.

Issues of Water Demands in the Okavango Delta

As earlier indicated, the Okavango Delta is widely recognized as a wetland of international significance that should be sustainably conserved in relation to its aquatic and terrestrial resources. Literature has shown that there are many factors and issues which determine domestic water use in any environment (Kadisa 2013; Kgomotso and Swatuk 2006; Kujinga et al. 2013; Oageng et al. 2014). It is, therefore, very ideal to understand these factors to enhance the sustainable management of water resources in the Okavango Delta and other similar socio-ecological contexts in other parts of the world. In general, the consumption lifestyles of different households are believed to be the main cause of stress over water resources (Hurlimann 2006). Studies have been conducted to investigate the determinants of water demand for both rural and urban settlements in Botswana (see Kujinga 2013; Oageng et al. 2014). Some of the studies addressing the Okavango Delta focussed on people's willingness to pay for water (Oageng et al. 2014) and water demand estimation, which assumed that water requirements were just a function

of population growth and the type of settlements (Kujinga 2013; Mazvimavi and Mmopelwa 2006). Others focussed on economic models in which the roles of economic factors (e.g. water prices and consumer incomes) affecting demand were addressed (see Kgomotso and Swatuk 2006). Recently, demographic factors such as household size (Makki et al. 2013) gender and education (Mmopelwa et al. 2014)—all of which affect water demand—have been studied as well. While all these variables are very important to water governance, the studies done in the Okavango Delta did not make an in-depth analysis of how cultural water management practices and values affect water access and use among the indigenous people. This is in spite of the fact that rainmaking specialists (*baroka ka pula*) and the rainmaking enclosure (*segotlwana sa pula*) are accorded a high status within the delta (Stanley 2014). From an African perspective, ignoring such critical cultural water management values in favour of Western values is not only inimical to rural development (see Kolawole 2001, 2009, 2015) but also violates the fundamental human rights as enshrined in the African Charter on Human and Peoples' Rights of 1991. It is, therefore, imperative that cultural water management practices be accorded the same status as the Western methods of water management. While putting an emphasis on economic models of water governance is not entirely out of place, it may be unethical to pay little attention to cultural values of water within an area given socio-cultural context in which the local people place high value on cultural water management practices.

A number of the studies also reveal that ownership of water-related amenities (such as washing machines in the lodges, gardens and swimming pools) is also an important factor influencing water demand in the Okavango Delta (Kadisa 2013; Kujinga et al. 2013). Nonetheless, they did not pay attention to understanding how spirit mediums may have an effect on water demand and ownership of water sources among different ethnic groups within the Okavango Delta. Elsewhere, a range of attitudinal and behavioural factors (see Randolph and Troy 2008) and cultural and religious-related variables (Kanwar, Kaza, and Bowden 2016) as well as those bordering on urban built environment (Yan 2016) have been identified as those affecting water demand, although such studies in the Okavango Delta are either scanty or non-existent. Household demand for water includes basic needs like drinking, personal hygiene, cooking and laundry as well as usage related to leisure activities like canoeing in Lake Ngami or some other activities such as garden watering and car washing (Kadisa 2013). In other words, household's water consumption in the Okavango Delta comprises discretionary and non-discretionary usage. This classification is very crucial when examining the factors affecting drivers of water demand.

Price, which is one of the most important factors influencing domestic water consumption, is also regarded as the most effective incentive for achieving water serving potential (see Oageng et al. 2014). The logic behind the emphasis of pricing is that higher water prices result in less water consumption (Savenije and van der Zaag 2002). Thus, price-elasticity tends to be greater when dealing with outdoor leisure-related activities than with indoor water usage, because indoor water usage fulfils more basic needs (Yan 2016) and hence there is less price elasticity. However, the price effect varies depending on several other factors,

such as the metering approaches, the household's acknowledgement of pricing and the household's economic status (Mmopelwa et al. 2014). Lack of information about the water price among households is likely to render the pricing instrument less effective (Yan 2016). Kujinga et al. (2013) observe that income levels are positively related to residential water consumptions. The authors posit that an increase in income levels is often accompanied by an improvement in living standards, which suggests an increase in the number of new water consuming household appliances such as those used for doing laundries, watering gardens, washing cars and swimming pools. Another factor signalling income matters is that affluent households, unlike low income households, are not likely to respond to price incentives as they are not effective enough to induce such a response (Renwick and Green 2000; Yan 2016).

As earlier observed and beyond water price, demographic and social factors have been analysed in water demand studies across the Okavango Delta and elsewhere. Murdock et al. (1991) found out that demographic factors (e.g. age of a householder and household type) are of great importance than economic factors in explaining per capita water consumption. Household or population dynamics such as household size, household composition, age structure, gender and employment status is the basic elements that facilitate understanding of domestic water consumption (Lux 2008). As opposed to economic factors, socio-demographic factors have more influence on water usage than price incentives, although Arbués et al. (2010) observed that a certain level of economy of scale exists in large households. Yan (2016) found out that the more the number of members living in a household, the higher the aggregate water consumption by the household. The rationale behind Arbués et al. (2010) argument is that water is used more efficiently in large households as members share resources. For instance, people tend to take short showers in large households so that others can quickly take their turns in the use of bathrooms (Troy, 2000). However, Arbués et al. (2010) and Raditloaneng (2012) suggest that small households are better able to adjust and respond to water price changes due to reasons of incentives and capital control factors.

Age and gender also are of paramount importance in the study of water demand, although they have attracted less study compared to other variables in water demand and management in the Okavango Delta and the whole of Botswana. Literature has shown that there are two opposing arguments on the relationship between age and water consumption (Billings and Day 1989; Schleich and Hillenbrand 2009). One argument proposes that as people age, they use more water (Billings and Day 1989). Schleich and Hillenbrand (2009), who analysed water consumption in over 600 water supply areas in Germany using regression analysis, found out that per capita water consumption increased by 1.8 litres per day with a one-year increase in the average age. This may have been because many retired people in the developed world spend more time at home and thus, have more chances to use water, such as watering their gardens and bathing (Billings and Day 1989). However, this finding contradicts Manzungu and Machiridza's (2005) study in Zimbabwe in which they observed that very old people in the city of Harare use less amount of water as compared to young people even though a majority of them spend most of

their time at home. Thus, age has a negative relationship with water consumption (Nauges and Thomas 2000) just as Makki et al. (2013) who examined the factors engendering water consumption for showering in Australia noted that households with children consumes more water in shower than households without children. The contradictions between these empirical findings may be attributable to the differences in social context examined or to differences in the study periods (winter or summer) or geographical location (rural or urban). Buttressing this finding, literature from Western countries (Aminzadeh et al. 2000; Gitlin et al. 2001) have shown that many elderly people tend to use their bathroom more often due to health concerns, indeed concurring with Billings and Day's (1989) observation in Germany.

Gender is regarded as an important factor in water management due to the substantial variations in water use between genders. Females have been noted to use more water than males, given the fact that they are more likely to undertake water-related activities in the house than their male counterparts. Raditloaneng (2012) and Makki et al. (2013) observed that females are more likely to take a longer shower than males. Gender differences are also suggested to exist in environmental concerns. An investigation into gender differences in water usage indicates that females are more likely to have high-water demand levels than males (Fink 2011), particularly household-oriented water demand. While this might hold true to a considerable degree, the composition of today's households (where either males or females are staying away from their families due to labour movement) implies a change of roles in which males assume females responsibilities and vice versa. In other words, gender role becomes insignificant in determining water demand because all people (irrespective of gender) are engaged in the same household's chores.

The impact of household composition on water consumption mainly reflects the effects of age, gender and size. For instance, a study in Sydney, Australia, by an Independent Pricing and Regulatory Tribunal in 2010 indicates that large water consumption tends to increase in households comprising couples with children. Another way in which household composition impact on water use (demand) is the tenure status of the dwelling. Randolph's (2006) research on the relationships between dwelling type and water consumption in Sydney (Australia) reveals that people who are renting tend to be inactive in adopting water saving actions compared to those who are living in their own dwellings. This phenomenon emanates from the fact that tenants in some cases do not pay their water bills directly to the service providers. A case in point is whereby the landlord includes water charges in the housing rentals, which precludes tenants from paying their water bills directly to the service providers. In such scenarios, the tenants are unaware of their water consumption rate. It is then difficult for them to respond to calls soliciting for the need to save water. For instance, Yan (2016) observed that, in Australia, tenants who do not pay their water bills directly to the water corporation see no reason for adopting water conservation strategies. However, given the fact that all people act as economic being (McNeil 1998), who try to minimize costs but maximize profits, it is highly unlikely that any landlord would want to pay exorbitant water bills incurred by tenants. As such, the landlord has three

options. First, they can compel the tenants to reduce their water consumption. Second, they may decide to install a separate meter for the tenants. Third, they may be forced to not renew the tenant's rental contractual agreement if none of the suggested solutions prove to be efficient in reducing water consumption rates. Ultimately, ownership of water use appliances as well as dwelling tenure type have an impact on water demand even though the impact varies depending upon the frequency of usage of the facilities (Murdock et al. 1988) and the water use efficiency of the appliance (Grafton et al. 2011).

Water use difference between dwelling types is suggested to reflect the household make up, size or the presence of water use appliances. For instance, unit dwellers are less responsive to price incentives because they use a common meter for measuring the water usage in their building block. Other principal factors such as temperature and rainfall also matter. The climatic factors are expected to have an impact on outdoor activities such as garden watering and family swimming pools (Yan 2016). Education level is considered to correlate with an individual's water usage. The reasoning behind this is that highly educated people are expected not only to have extended knowledge of water demand issues, but also to be more conscious about water protection and management (Yan 2016).

Culture and religion play an important part in the lives of Batswana, more especially among rural Okavango Delta communities. Water has been and is still central to both their culture and religion. The African people have always maintained a connection between water and land. Water also plays a central role in many religions and beliefs in Africa and beyond; there are often rules regarding the use of water based on the religious teachings and principles. As a source of life, water represents birth or re-birth. It also represents purity, and these qualities confer a highly symbolic and even sacred status to water. Water is, therefore, a key element in ceremonies and religious rites. Religion provides a variety of examples of how water has been regarded as part of the sacred life process, and not just another product for consumption.

There are two main issues that pertain to the cultural and religious use of water; they are issues around (i) access to water sources and (ii) pollution. The statutory water management institutions like the WUC and DWA need to address these issues in their water management strategy or other complementary strategies.

Concluding Remarks

Various institutions have an interest in water management issues in the Okavango Delta because of its status as a wetland of international importance. Amongst these are customary and statutory institutions that give the mandate to allocate water to various sectors of the economy. To better understand the interests of different institutions in water management, the legal pluralism theoretical framework was applied, and analyses showed that water had a cultural value in rural areas unlike in the urban centres, where the economic value of water seemed to be more important. The article reviewed the milestones already recorded in Botswana's water sector legislative instruments. The findings showed that age,

culture, education and income levels among others directly or indirectly influenced rural household water management decisions in the Okavango Delta. Although there is a commitment on the part of the government to improve the water sector as evidenced in the new draft Water Bill (2005), and the recently formulated Water Policy (2012), Botswana's water legislative environment has always been characterized by old and outdated laws. Whereas the current efforts on water policy issues are plausible, the main challenge associated with the process is the bureaucratic bottlenecks inherent in the approval and functionality of the policy documents.

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Chapter 3

Demographic and socio-economic factors influencing water governance in the Okavango Delta, Botswana

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Demographic and socio-economic factors influencing water governance in the Okavango Delta, Botswana ☆

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ABSTRACT

Demographic and socio-economic factors influence water resources governance at the household level particularly in rural areas of developing countries where culturally assigned gender roles in water governance hold sway. Rooted in the institutional bricolage and the Mass-elite theories, this paper analyses demographic and socio-economic factors influencing the dissonance of customary and statutory institutions in the governance of water resources in the study area. Employing a homogenous purposive sampling technique, three villages (that is, Shakawe, Tubu, and Shorobe) were selected for this study. Four hundred and fifty-five household heads were randomly selected to elicit pertinent demographic and socio-economic data through an interview schedule and expert purposive sampling technique was adopted to select 9 key informants from whom in-depth information was obtained. Statistical Package for the Social Sciences (SPSS) version 25 was used to analyse descriptive and inferential statistics. Content analysis was used to analyse qualitative data. The results also reveal that there was a gender imbalance in water collection and water consumption was relatively higher in small households than in large ones. However, there was no evidence that age affected water consumption. Findings also revealed that affordability, distance to water sources and the intended use of water are a factor of access to water. Results further show that income is a key determinant of the amount of water consumed by the respondents. The paper concludes that there is need for an integrated water governance model that serves to enhance the demand and consumption of water resources in local communities.

1. Introduction

Water governance denotes a range of political, social, economic and administrative systems meant to develop and manage water resources as well as the delivery of water services at different levels of society [14,67,79,85]. While water governance

☆ The word Motswana (singular) and Batswana (plural) denotes a person and the people who live in the study area, respectively

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focuses on decisions making on water allocation amongst stakeholders, this article shows how demographic and socio-economic variables influence decision-making on water consumption.

There is a consensus both among academics and policymakers that decisions on water management are shaped not only by infrastructure and price but also by demographic and socio-economic factors [37]. Based on the findings of Kujinga *et al.* [46], there is no national demographic and socio-economic water relationship data base in Botswana. This is because water situations differ from one local area to another. To understand how demographic and socio-economic factors engender the dissonance existing between customary and statutory institutions in the governance of water within the Okavango Delta, data on demographic and socio-economic as well as cultural variables have to be elicited from various case studies in different localities in the area. For instance, the assumptions that women are the main household water collectors and decisions on water management are made only by men in traditional societies [78] have been proved wrong in a study by Hawkins and Seager [37] who found that although rural Mongolian men are at the forefront in water management decision-making process, they also play prominent roles in water collection.

Based on Bich-Ngoc and Teller [6] the assumption that an increase in water prices would lead to a decrease in water consumption is true if and only if water behaves like a *normal* economic good. Water is not like any other economic good. For instance, Savenije [71] argues that as most water uses are essential and irreplaceable, the market theory cannot simply be applied to domestic water consumption. Studies have shown that domestic water consumption is price inelastic; a sharp rise in water price generally leads to insignificantly low or no change in domestic water consumption [23,56]. However, it is noteworthy that the price elasticity of water demand varies among different end uses. Whereas the price mechanism does not make a difference in domestic water consumption, it significantly influences outdoor water uses such as leisure activities, gardening or filling swimming pools [6].

There is a large body of literature on gender and water governance (see [8,17,38,58,84,86]). While the case studies that comprise this literature are diverse, one major issue that emanates from them suggests that women are responsible for domestic water provision and are denied decision making roles in customary institutions. While good water governance prescribes that women and men negotiate equally over water allocation [78], literature shows that decisions on water management are made by males. This is despite the fact that men and women do not have similar interests on water [58]. While this is a culturally assigned gender roles [59,63], some scholars argue that it overlooks and constrains women's ability to make decisions on water management [13].

The age of an individual is also worth considering when studying water governance. The findings linking age of an individual to water are less clear as some researches show that elderly people consume less water but make significant decisions on water at the household level [34] while others [50] believe that children consume more water than the elderly people. This implies that further research is needed on this subject especially under varying conditions. The objective of this paper is to assess demographic and socio-economic variables influencing dissonance between customary and statutory water management institutions in the governance of water resources in the Okavango Delta.

2. Theoretical framework

This paper is rooted in the institutional bricolage theory proposed by Frances Cleaver in 2001[11] and the mass-elite theory as conceived by Gaetano Mosca (1858-1941). Cleaver's [12]) institutional bricolage theory is premised on the notion that common-pool resources (CPRs) are subtractable, which means the withdrawal by one consumer or a group of consumers reduces the number of such resources left for other users [62]. The consequence of use is either overexploitation or depletion if precautionary measures are not taken. To overcome this problem Cleaver [12] suggested a bricolage approach to natural resources management and governance where both formal (statutory) and informal (customary) institutions are hybridised to permit, forbid or incentivise certain human behaviour which is locally oriented and understood [16,42,57,61,62]. Bricolage is the process of patching together institutional arrangements to encompass the aspirations, views and technology of local people. It covers the acceptance of both customary and statutory institutions in the management of local natural resources. The notion is based on the logic of dynamic adaptation to the local conditions [12]. Thus, bricolage theory calls for the hybridisation of customary and statutory institutions by the stakeholders (bricoleurs) to come up with rules and laws which take into cognisance the local conditions and the level of understanding of the indigenous people who are the custodians of such resources. Thus, the bricolage concept underscores the aspect of involving the local stakeholders who are of a cross-cultural origin in the formulation of rules that govern local resources.

On the other hand, elitism is about the notion that individuals who form an elite (a select group of people with an intrinsic quality, high intellect, wealth, special skills or experience) are more likely to be constructive to society as a whole and, therefore, deserve greater influence or authority in policy development than those of others. This paper thus investigates the demographics and socio-economic attributes of respondents in relation to how they influence water governance. The main tenet of the mass-elite theory is that every society is stratified and, therefore, comprises the elites and masses [64]. While the elites refer to the educated, those in authority or influential people in general [52], the masses comprise the hapless majority who have neither power nor authority within the society [64]. Based on the theory, policies, legislations as well as taboos, norms, and values are crafted by the elites and, therefore, largely reflect their interests rather than those of the masses [28,35]. It is presumed that all institutional arrangements are biased towards the achievements of the

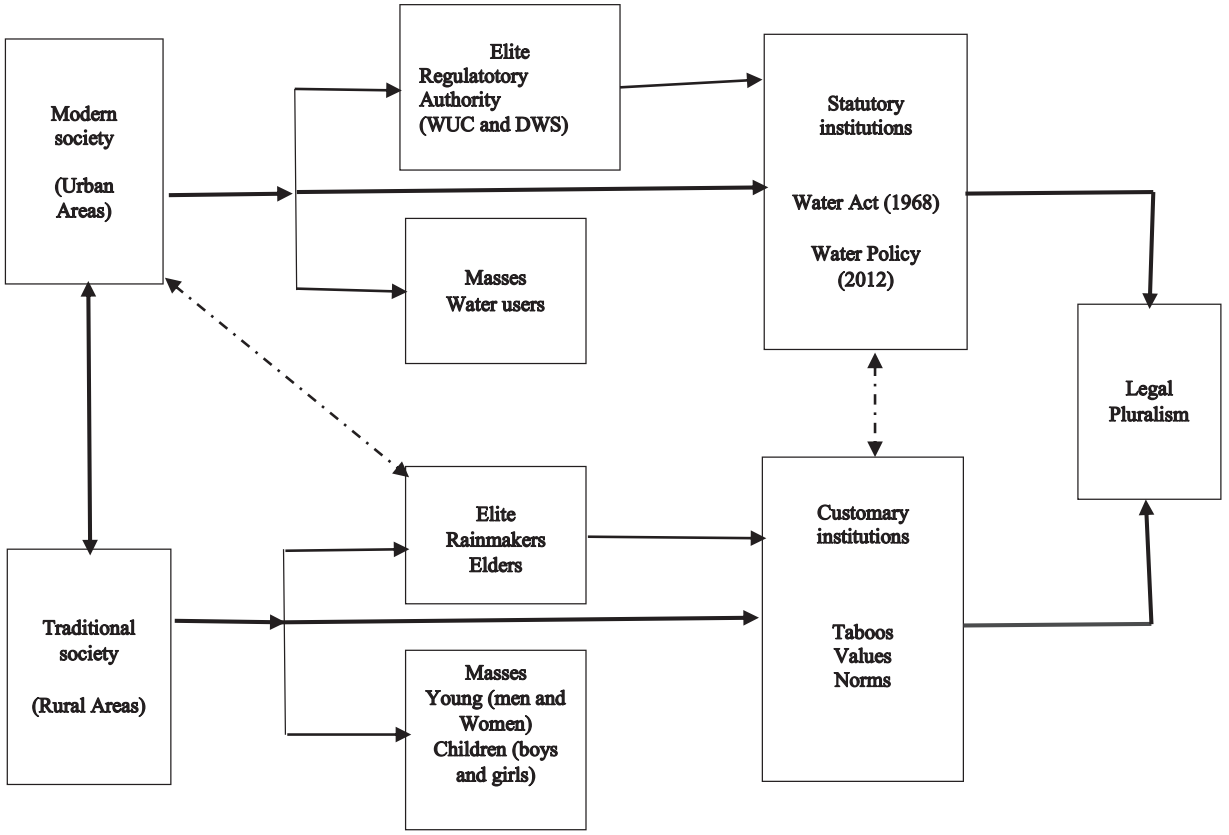

Fig. 1. Theoretical framework on water resources management. adapted from [31].

objectives of the elites at the expense of the masses [31,72]. Inevitably, suggestive of a top-down approach to policies, Acts (statutory institutions) or rules, taboos and norms (customary institutions) within the jurisdictions of the two categories of institutions.

Fig. 1 is an illustration of the mass-elite theory as applied in the governance of water resources in the study area. It shows that there are elements of modern and traditional water governance institutions within the study area. On the one hand, there are elites in a modern society comprising the regulatory authorities such as Department of Water and Sanitation (DWS) and Water Utilities Corporation (WUC) among other modern entities. On the other hand, there are masses which include all water users who are not a part of the statutory institutions. Elites are so conceived in this manner because they have the (modern) expertise and are knowledgeable in terms of water law and policy formulation as compared to the masses, who do not have such modern knowledge. In traditional society, the elites comprise chiefs, rainmakers and all the elderly people who are experts in the indigenous knowledge and utilise it in water resources management and governance at the household level. The masses in traditional societies comprise individuals who do not enjoy privileged positions and are also not well versed in the knowledge of local taboos and norms of water use. Privileged individuals are conceived as those who have better demographic and socio-economic statuses within the society. Thus, this theory presumes that laws and policies as well as taboos, values and norms, which govern water management, are designed by the elites to regulate the activities and conduct of the masses in water management. It is noteworthy that there is a dissonance between customary and statutory institutions in the governance of water resources in the study area. The contradictions arise because the statutory institutions label the customary institutions as old fashioned [26] and out of touch with reality in the modern days [15]. On the other hand, customary institutions in-turn feel alienated from their cultural ways of water management [55] as a foreign culture is imposed on them [26].

In this regard, the model suggests the fusion of the two institutions to produce legal pluralism (a hybrid institutional arrangement), which embraces the perceptions of both the masses and the elites operating within both institutions. Such a fusion fits well with the institutional bricolage theory which emphasises the consideration and cooperation of the local conditions when crafting rules and laws that govern natural resources management. The adoption of legal pluralism institutional arrangement is likely to assist in resolving the existing dissonance between customary and statutory institutions in the governance of water resources within the study area and perhaps elsewhere.

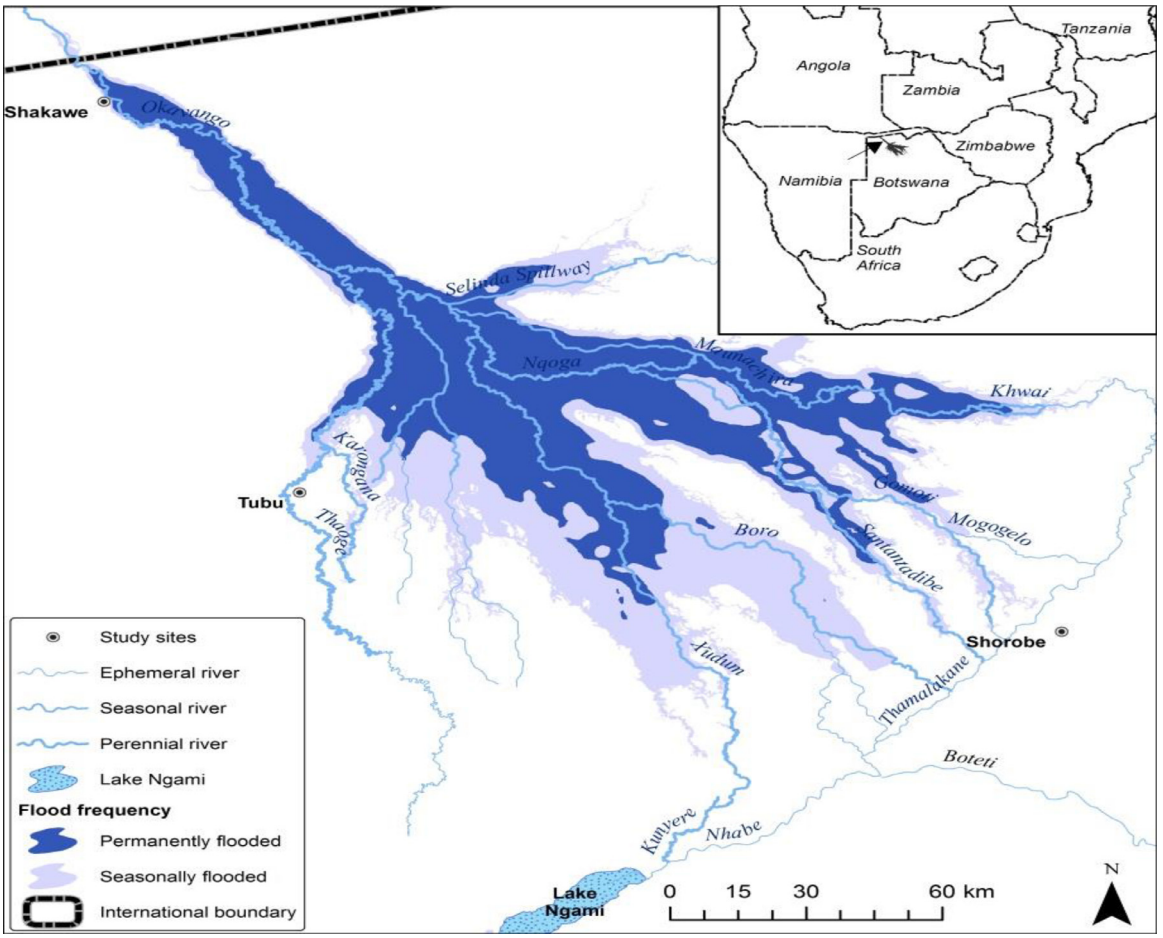

Fig. 2. Okavango Delta map showing study sites. Source. ORI, GIS Lab, 2019.

3. Methodology

3.1. Study area

This study was carried out in three villages of Shakawe, Shorobe and Tubu in the Okavango Delta (Fig. 2). This is a large inland alluvial wetland delta characterised by a very low level of anthropogenic transformation in the semi-arid north-western Botswana [51]. Across its 15,000 square kilometres, the Okavango Delta is very flat, varying just two metres in height. The Okavango Delta has more than 150,000 islands[18]. Some are just a few metres wide while the large islands are over 10 kilometres in length. It covers an area of 22 000 km^2 and is one of the world's largest inland deltas [36,51]). The delta's inflow of water is supplied by two rivers namely Cuito and Cubango from the 1300 mm per year summer rains which fall between November and March in the Central Angolan highlands [53,51]; [53]). The Okavango Delta consists of five ethnic groups each with its own identity and language [7]. These are BaSarwa, BaYeyi, BaMbukushu, BaTawana and Ba-Herero [19]. The largest ethnic group are the BaYeyi [19], who migrated into the area from Zambia ([47], 1977). The BaYeyi settled on river islands and they brought canoes and fishing nets into the Okavango Delta. BaYeyi generally maintained good relations with the BaSarwa [19]. The HaMbukushu came from Angola due to colonial and civil war in the 1970s. They settled around Etsha villages south of Ikoga. HaMbukushu and BaYeyi lived in spatially separated family units in scattered communities and both were very mobile ([44,48,76]. The BaTawana and BaHerero migrated from Namibia and were responsible for the introduction of cattle in the area. The BaTawana and BaHerero arrived in Ngamiland at the end of the 18th Century and became politically dominant in the region [76]. Highlights on the ethnic groups are provided in this subsection to underscore the cultural diversity of the respondents and how this affect water management in the study area. Shorobe, Shakawe and Tubu villages were suitable for this study because of the availability of several ethnic groups which makes this study more relevant because different ethnic groups had various beliefs regarding water management. Furthermore, the choice of the villages was done based on their remoteness and the water-related forms of livelihoods which make it imperative to

Table 1
Villages, total number of household heads, target and actual sample sizes

	Village	Total number of household*	Target sample size $n = \frac{N}{1+N(e)^2}$	Actual sample**
(i)	Shorobe	64	55	55
(ii)	Shakawe	1487	315	314
(iii)	Tubu	118	91	86
Total		1669	461	455

* Source: Statistics Botswana, 2011
** Field survey, 2018.

harmonise customary and statutory water management institutions. Water supply in these villages was erratic [43]); hence villagers at times obtain water for domestic use directly from rivers.

The thrust of the article is to understand the influence of demographic and socio-economic variables interfacing both customary and statutory water institutions in the selected grassroots communities.

3.2. Sampling

According to Statistics Botswana [32]), while Shakawe has 1487 households Tubu and Shorobe have 118 and 64 households, respectively. Taro Yamane's formula (see Table 1) was used to sample (in proportion to size) a total of 461 household heads from Shorobe (55), Shakawe (315) and Tubu (91).

A discrepancy was found in Shakawe where the sample size target was less 1 household, and in Tubu where it was less 5 households As such, a total of 455 (instead of 461) interview schedules were administered to households by five well-trained degree holder, research assistants. The respondents were interviewed using the local language. Specifically, the selection of the household was done using random number table. This method was adopted because it reduces bias by ensuring that all households in the three villages had equal chance of being sampled [21]. Firstly, the households were numbered from 1 to 64 because there were 64 households in Tubu village. Secondly, the criteria for selection were set. Any number below 0 and above 64 was omitted and lastly, repeated numbers were ignored. For example, the first 20 households in Tubu village were selected horizontally based on the randomness of the numbers considering the cut off numbers as set in the criteria. As such, households 20; 17; 42; 01; 33; 55; 58; 60; 49; 04;27;56;11;63;31;05;64;26;07; and 23 were selected because they fell within the range of the set criteria. The same approach was used to select samples in Shorobe and Shakawe communities. Thus, randomness ensures that every household in the three villages had an equal chance of being selected as part of the sample [45].

3.3. Data collection

Data collection tools comprised household interview schedules, key informant interview and focus group discussion (FGD) guides. Household interview schedules were designed to capture demographic, income and socio-cultural variables and were administered by five well trained research assistants who spoke the local language. Interview schedule was used to elicit information from household heads because the population were largely non-literate; the tool yields data within a very short space of time [25]; the data are easily analysed using computer programme such as SPSS [75]; the data obtained are in the respondent's own words and the tool allows for probing for additional alternatives [68]. Using interview guide, one key informant was interviewed from the Water Utilities Corporation (WUC) while eight were interviewed from the Department of Water and Sanitation (DWS). Three focus group discussions (FGDs) comprising a minimum of 12 participants per session were held. Each of the FGD sessions comprised village elders (three chiefs, three deputy chiefs) and government officers (DWS and WUC) who had a vast knowledge of water management. A FGD is used to gain a deep understanding of issues that remain unclarified during a household survey [54] and it also meant to add meaning to the existing knowledge or getting at the why and how of the issues under study [60]. Thus, FGDs provided a platform for clarifying demographic and socio-economic factors influencing the dissonance between customary and statutory institutions in the governance of water resources in the study area. To ensure reliability and validity of the, data collection tools were pre-tested at Matsaudi village, which is a village outside the study sites but with similar features as the three villages where the actual study took place. This was also done to ensure that the interview instruments accurately measured the variables that were investigated in the study and ascertain the timeliness of answering the questions embedded in them.

4. Results and discussions

4.1. Customary and statutory institutions perceptions on water

This section begins by highlighting stakeholders' perceptions on the roles of customary and statutory institutions and the contradictions existing between them in the governance of water resources. In the study sites, water governance is

Table 2
Customary and statutory institutions dispositions on water governance in the Okavango Delta (n= 455).

Customary institutions	Statutory institutions
i. Water is a free resource	Water is a commodity and needs to be sold and bought
ii. Water cannot be bought or sold	Water should be bought and sold.
iii. Women basically collect water	Primitive belief
iv. Men only maintain water facilities	WUC and DWS maintain water infrastructures
v. Lack of formal recognition	Formally recognised
vi. A spiritual relationship with water	Myths are backward and primitive
vii. Water bodies are sacred	Myths are backward and primitive
viii. No-one can be denied access	Those who fail to pay water charges are denied access

Source: Fieldwork, 2018.

regulated by the Water Act (1968) and the Water Policy (2012). The Water Act (1968) is the major legislation on water governance in the entire country. The interview with the DWS officials clearly indicated that water is held in trust by the state on behalf of Batswana[1]. In statutory institutions, water is recognised as a scarce resource and, therefore, a public good with a value for which consumers need to pay to sustain its supply. This is contrary to customary institutions' ideals which underscore water as a non-tradable item or commodity but conceived as an abundant and living part of nature [3]. Thus, water is a sacred entity which belongs to nature and cannot be owned by anyone (UN, 2018). Recognising the significance of water, the Government of Botswana drafted a Water Bill [33] in order to do away with riparian rights and to ensure that commercial uses of water are only fulfilled in line with social and environmental needs. Judging from the perspectives of the two institutions, there is a value conflict in water management in the study sites; the statutory institutions prioritise market forces at the expense of cultural values. One participant during a FGD in Shakawe had this to say:

> Conflicts in water management between customary and statutory institutions in the Okavango Delta arise from the cultural assimilation forced upon us; we (the old people) are told water should be bought and sold. This is what we have never experienced since we started living in this area long back in the 1950s.

The results support the mass elite theory, which postulates that a powerful few make decisions on public policy while the powerless majority do abide by the rules and regulations crafted by the elites. The elites whom are associated with statutory institutions allocate values on water governance while the masses are at the receiving end of public policy on water issues. Regardless of the status quo in the study area, the best approach in water governance is to apply the institutional bricolage theory which emphasises that the locals' water needs should be included in the overhaul water management system [11]. Participants who were sympathetic towards customary institutions during one of the FGD sessions revealed that water should be enjoyed as a free resource, accessed through wells, rivers and streams. This contrasts statutory institutions' position, which emphasises on the need to demand a nominal fee from consumers in order to maintain water supply infrastructure, which indeed was misconstrued as a full cost recovery by respondents in the study area. Based on Akpabio [2] viewpoint, the way people perceive water shapes their attitudes to management issues. Table 2 is a summary of how adherents of customary institutions (mostly old, with low formal education individuals) and those of statutory institutions (mostly young, educated and government employees) perceived water governance.

While variations in ontological perceptions exist between customary institutions and statutory institutions in relation to the values attached to water, the point of departure is that water needs to be frugally managed [1,5]. For customary institutions, frugal management of water comes to bear in the use of taboos and the idea that there are deities living in water who instil fear into people so that they do not degrade and wastewater. The approach in the statutory institutions with its peculiar monetised economy is to apply the user pays principle in which the cost of water supply needs to be borne by the user. This approach aligns well with Cleaver's [12] institutional bricolage theory, which postulates that natural resources management needs to consider local factors that affect resources use. Cognisant of Cleaver's [12] theoretical postulations, it is important to acknowledge that solutions to water management, which are devised and perpetuated by local people, stand a better chance of long-term success.

4.2. Age of respondents and water management

Age of respondents is a crucial variable in understanding water governance and consumption [27]. The results show that the average age of household heads was 42.5 years with a standard deviation of 16.24. A majority (26%) of the respondents belonged to the age group of 20-29 years. Approximately 25% of the respondents aged between 30-39 years. While 18.7% of them were between 40-49 years, 13.8% constituted those that belonged to the age category of 50-59 years. The elderly (60 years and above) constituted 16.3% of the respondents. Using SPSS version 25, a Kruskal–Wallis test was performed to determine the difference in the perceptions of water management by different age groups. The results revealed that there was no significant difference ($X^2 = 8.2$, $p = 0.09$) in the way respondents of different age groups perceived water

[1] The word Motswana (singular) and Batswana (plural) denotes a person and the people who live in the study area, respectively

management in relation to customary and statutory institutions. The type of water source used by households was also not influenced by age of household head ($X^2 = 214.3$, df = 264 $p < 0.99$) given that there was no significant association between the two variables.

4.3. Water as a social or economic good in the context of water management

Decision-making on water is a pervasive aspect of water management. While in statutory institutions, water governance employs secularised economic principles to push cost recovery [34], customary institutions adopt a spiritual approach [29] within the context of which non-tangible spirits are perceived as enabler of clean water [31]. Despite the divergent perceptions existing between customary and statutory institutions, only statutory aspirations are adhered to owing to statutory institutions having autonomous power over water use and management [29,31]. This is a scenario situated in the context of the mass-elite theory. Whereas the results revealed that only 12% of the young people (40 years and below) agreed that, "[t]here are spirit beings in water sources", the majority (71.5%) of the elderly (60 years and above) affirmed this assertion. The results also revealed that 90% of the key informants in the study area believed that there were souls of human beings in water sources. The belief was emphasised in customary institutions and among the elderly than the young people. For instance, it was revealed during FGD in Tubu and Shakawe that the fear of getting drowned, which has a spiritual connection, is linked to the belief that water is the habitation of spirit beings, and which in turn, assists in instilling fear in people to refrain from activities that degrade water resources. An interview with key informants in the two communities also revealed that 80% of the elderly people believed that: "[h]uman souls are embodied in aquatic animals like crocodiles and frogs". This perception implies that water pollution becomes inimical to those lives and thus the human souls embodied in them. While both institutions had a common understanding that water pollution is objectionable, the approach used by them to combat this problem differs. While in customary institutions water pollution leads to drowning of the perpetrator as a punishment from water spirits, statutory institutions relied on fines to curb the vice as prescribed in the Water Act (1968)

The notion that *water is a gift from nature* was widespread amongst elderly people within the study area. While statistical analysis showed that there was no significance difference in perceptions amongst people of different age groups, literature revealed that elderly people usually favour customary institutions than the younger generation who are sympathetic towards statutory institutions [4,10,41,80]. The discord in the results could be attributed to the relatively small sample size of this study as compared to studying the whole communities in the delta. According to Akpabio [4], the notion that water is a gift of nature enables it to be enjoyed as a free resource, accessible through different water facilities including well, streams and ponds. An elderly man during the FGD in Shakawe pointed out that "[w]ater comes from God and that is what I know since birth and this idea that people should pay for water is new to us". In addition to this, the elderly regarded bodies of water as homes of deities. A confirmation of this proposition was made by one elderly respondent during the FGD session at Shakawe:

> To tell you the truth, I only drink from Okavango River and nowhere else. This is because this is what our ancestors drank and used over many years and they survived. So why should we change? It is all this change that is making the gods to be annoyed and which have led to many problems in our society.

The perception of water as a free resource makes the residents avoid using the water supplied by the DWS but would prefer to obtain it from rivers and dugout wells. Asked whether it was possible to provide free water to poor people in this village, one key informant in the DWS responded thus:

> *It is possible, in principle, to provide a minimum amount of water for free for the underprivileged people. It is, however, often considered more sustainable to ask for a nominal connection fee or charge at a subsidised rate to enable us to provide them with proper service.*

While the DWS is willing to supply water to residents especially the less privileged, its position was that the imposition of a nominal fee was essential to enable the organisation to recover some processing costs for the purpose of sustaining water supply to the residents.

4.4. Reliability and sources of water in the study area

Fig. 3 illustrates the sources of domestic water in the study area. The majority (85%) of the respondent's fetched water from standpipe taps and the least (0.7%) obtained water from dug out wells.

Fifteen percent of the respondents who elaborated on their decision to collect water from rivers and wells indicated that the availability of alternative water sources coupled with high cost of water from standpipes were the main reasons for making the decision to collect water for drinking and bathing from different sources. It was a commonplace to notice that those who collect water from rivers and wells were the old women. This implies that women are most probably burdened with water collection task in rural setups and usually do have insufficient income to afford water bills. Participants revealed that they spent less money on water as they draw the bulk of the water from rivers and wells and only fetched water for drinking from the standpipes. The results concur with those of Elliott et al. [22] and Kelly et al. [42] in Zambia, Ghana and Kenya rural communities, which confirmed that households often use more than one source of water to meet their daily water needs, with sources selected according to use, and which often change across seasons.

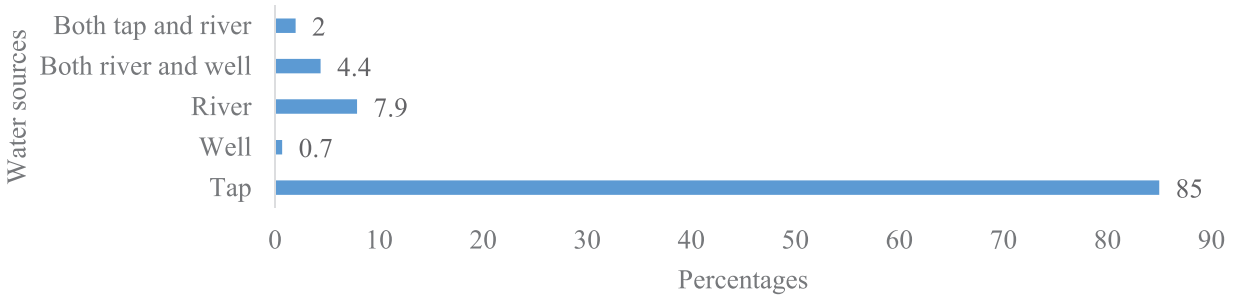

Fig. 3. Sources of water in the study area (n = 455). Source. Field survey, 2018.

Table 3
Reasons for fetching water from sources other than tap in the study area (n = 455).

Reasons	Frequency (%)
(i) Tap water could be unavailable for 1-2 weeks	22.6
(ii) Water is always available though it is black or brown	3.3
(iii) Tap water is always available but with very low pressure	1.5
(iv) Tap water could be unavailable for over 3 weeks and up to a month	20.1
(v) Taps are dry for one or two hours daily.	13.4
(vi) We experience water cuts every day	3.3
(vii) Water is always available at night and early morning hours only	5.5
(viii) The tank is too small to supply enough water since the population has grown	3.7
(ix) We started experiencing water supply problems when WUC took over from DWS	4.8
(x) Water shortage is a daily problem in our village	5.2
(xi) We always rely on river and well water	16.6

Source: Field survey, 2018.

Responding to the interview schedule question on how reliable their water sources were in terms of the time period during which water was available, study participants provided reasons why they obtained water from unimproved sources even though treated pipe borne water was supplied through standpipes. Table 3 summarises these reasons and their frequency (in percentages).

To mitigate the problems of intermittent water supply, households adopt coping strategies including resorting to river and shallow well water. One key informant in Shakawe affirmed that "[a]t times, residents wash their clothes and kitchen utensils along the riverbank instead of taking the water home". The findings revealed some disparities in water supply within the study area and that the interruptions lasted for longer periods in some villages than others. For instance, households in Tubu village indicated that water could be unavailable for over a month as opposed to Shorobe and Shakawe where water could be unavailable for only one to two days. It was also noted that affluent households had better coping strategies including installation of water storage tanks and could afford transportation of water from faraway places. Such a scenario was witnessed in Tubu where households were bringing water to Tubu from Gumare, which is about 20 kilometres away. The results also suggested that low income households were more affected by the interruptions of water supply than their high-income counterparts who had flexible coping mechanisms.

4.5. Gender and water governance

As earlier observed in the paper, gender plays a prominent role in water governance discourses. Fig. 4 reveals that there were more female than male respondents. Overall, literature has shown that in customary institutions the norm is that men in rural areas are less involved in water collection. Based on literature men are engaged in water collection when the distance to a water source is long [84] and the technological requirement to collect water is high [84].

Data from this study differ from the one conducted by Hawkins and Seager [37] on gender and water in Mongolia where they found that although men and women share responsibility for water collection in rural areas, men were the majority in water collection. However, the results of this study show that rural women in the study area played a dominant role in manual water collection. The results also indicate that elderly women who were not directly involved in water collection instructed young women in the household to collect water.

As water consumption varies between people of different sexes [39], gender becomes a vital variable in decision-making for water management at the household level [82]). Females are perceived as high-water consumers than males [39]. This is because they carry out more water-related activities than their male counterparts [39]. While Jordán-Cuebas *et al.* [39] study shows that females take long showers than their males counterparts, that of Fink [24] on gender roles indicates that women have a high level of knowledge on water conservation than men who are less frequently engaged in water conservation programmes. A Mann–Whitney U test was performed to determine the difference in the perceptions of male and female

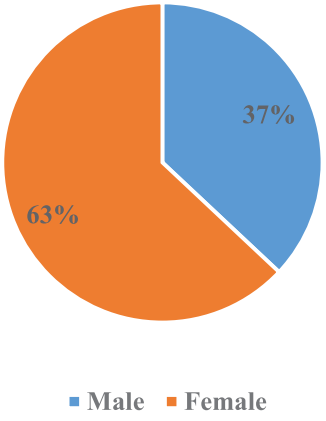

Fig. 4. Gender of respondents (n = 455). Source: Field survey 2018.

respondents on water management practices in the Okavango Delta. The results revealed that there was no statistically significant difference (U = 23860, p = 0.82) in the perceptions of males and females on issues surrounding water consumption in the Okavango Delta. As gender draws attention to the behaviours, values and attitudes that a society considers appropriate for males and females [74], the findings of this study might imply that men and women in the Okavango Delta had similar perceptions about their individual roles in water collection.

The results indicate that 69% of men at Tubu collect water than the other two villages. The preponderance of men in Tubu than in other villages in terms of water collection deserves scrutiny. The majority (69%) of men fetched water at Tubu because its availability was erratic such that whoever was available when the tap began to run performed the role of water collection. This opportunistic water fetching can best be explained by one of the Chief who remarked that: *[m]en collect water while women are working, preparing dinner or caring for the family.*Also, this uncommon gendered profile in rural areas might reflect the recent transition of Tubu from a village to a semi-urban area [46]. Thus, the transformation of the village resulted in the near disappearance of men's traditional role of animal herding and hunting, giving them enough room to engage in water collection obligations. (Personal communication with the Chief at Tubu, September 2018). Another explanation is that *[T]ubu does not have its stand-alone water supply system but rely on water from Gumare village which is 20 kilometres away* (DWS at Tubu, September 2018). This situation compels men to use animal-drawn carts to fetch water. An observation made during data collection by the researchers revealed that donkey drawn carts were the commonest water collection technology in Tubu.

4.6. Household size and water management

Household size is a vital variable for understanding water management at the household level [20]. Fig. 6 shows that the average household size was 6.6 members with a standard deviation of 3.9. On the average, results also revealed that a 6-member household consumed 80 litres of water per day. While the trend of the data obtained from the study shows that an increase the amount of water consumed did not increase in proportion to the number of household members, findings however, revealed that a household having one member consumed relatively more water as compared to a household having 6 or more members.

Based on Renwick and Archibald [66], household size is a vital factor in explaining water consumption and governance. A Pearson product-moment correlation coefficient showed a strong and positive correlation (r = 0.85; p = 0.01) between water consumed per day and household size. Van Zyl et al. [83] found that although large households used more water than small households, the former had a high propensity to save water by being able to optimize consumption levels than the latter. However, it is unclear whether the intention to save water is as a result of the desire to develop a conservation attitude [49] or the tendency to adjust the family budget, which invariably would lead to a reduction in water consumption in large households. This concurs with the observation of Sarabia-Sánchez and Rodríguez-Sánchez [70] who said that: *[a] large household size implies great consumption, though consumption per capita is not proportional to the number of people since there are economies of scale at work*. Thus, in a single-person household, water consumption is higher than in those with more persons.

4.7. Education and water management

Fig. 6 shows that most (76.3%) of the respondents had formal education and that the rest had non-formal education.

Results show that a relatively small percentage of the respondents (23.7%) had never attended formal school and all key decisions on water management were made by them. The educational achievement of an individual determines how one has access to improved water. An individual with a low level of education has limited opportunities to demand better

facilities from the authorities and they are less empowered to demand better services [30]. From the customary institutions' perspective, inadequate water facilities also affect the educational achievement of rural children (most especially girls) as they bear the burden of water collection [55]. However, data indicated that most (76.3%) of the respondents had acquired formal education; they had enough knowledge on water consumption. While the group that perceives water as a *gift from nature (23.7%)* was predominantly the holders of non-formal education, the majority (76.3%) of those who acquired formal education perceived water as a priced commodity. An independent samples t-test was conducted to compare participants' perceptions of water management between customary and statutory institutions among the people with formal and non-formal education. There was a significant difference ($t = 18.2$, $p = 0.00$ (two-tailed) the magnitude of the difference in the means was very large (eta squared = 0.42). This implies that education had a significant influence on how respondents perceived and managed water within the study area. Based on Akpabio's [4] study, traditional water governance institutions play a major role in individuals' daily relationship with water through the enforcement of various norms. It is noteworthy that people with informal education often comply with such norms to avert punishment [9]. We observed that people with some measure of higher education tended to favour water management through statutory institutions than people who had a low level of education and who tended to favour customary institutions.

4.8. Income and water management

Household expenditure, which is a proxy of household welfare, is the principal factor in household water management [46]. It, therefore, presupposes that households with low income are more likely to rely on unimproved sources of water because it is affordable [3]. Corroborating the findings of this study, Lawrence *et al.* [50] claimed that even in cases where improved water sources are provided, people may remain water-poor because they are income-poor and hence cannot afford potable water. This supports the opinions of 40 percent of the respondents from the interviews and FGDs conducted in Shakawe and Shorobe where they said:

> Okavango River is the source of water that is used the most. This is because, without money, pipe-borne water cannot be bought. This also explains why we use pipe-borne water for drinking and water from the river for everything else.

WUC is responsible for water supply to residents in the study area especially the less privileged. However, its position is that a nominal connection fee or charge at a subsidised rate is essential for sustainable water supply to consumers. Table 4 shows WUC potable water tariffs, which came into effect on the 1st of January 2013 to 31st December 2015. It shows three Blocks (Block 2, 3 and 4). In Block 2, the minimum amount payable per month per household was BWP20.00. In each block an additional amount of water consumed attracts a higher charge. It is also noteworthy that there is no provision for free basic water. This is because whether one consumes water or does not one still has to pay a fixed BWP 20 per month. High water consumers pay more.

Table 5 shows a breakdown of water supply charged per kilolitre in Botswana Pula (BWP). The tariff structure shows that potable water in the study area is priced in blocks and that the more water a household consumes, the more they pay in terms of water charges. This implies that household use other sources of water such as rivers and wells to access water for washing and bathing while water from standpipes is reserved for cooking and drinking. Thus, the cost of water influences the decision on which source of water to use.

Table 4
Domestic potable water tariff 2013-2015

Block	Min	0-5kl	>5-15kl	>15-25kl	>25-40kl	>40kl
2	BWP20.00	BWP2.00	BWP8.00	BWP13.00	BWP20.00	BWP25.00
3	BWP20.00	BWP2.00	BWP8.00	BWP13.00	BWP20.00	BWP22.00
4	BWP20.00	BWP2.00	BWP6.00	BWP11.50	BWP15.50	BWP22.00

Source: Water Utilities Cooperation Annual Report, 2017. (Kilolitres = 1000 litres)

Table 5
Domestic potable water tariffs (2017-date)

Block Tariff category (kilolitres)	Exc. VAT Revised 1st April 2017	Incl.VAT Revised Tariff 1st April 2017
Minimum charge	BWP0.00	BWP0.00
(i) 0-5	BWP3.50	BWP3.92
(ii) >5-15	BWP10.40	BWP11.65
(iii) >15-25	BWP18.20	BWP20.18
(iv) >25-40	BWP28.00	BWP31.36
(v) >40	BWP35.00	BWP39.20

Source: Water Utilities Cooperation, 2017.

Table 6
A water bill for 45 kilolitres of water consumed per month

Potable water		VAT @ 12%	Total
(i) First 5 kilolitres @ BWP3.50	BWP17.50	BWP0.00	BWP17.50
(ii) Next 10 kilolitres @ BWP10.40	BWP104.00	BWP12.48	BWP116.48
(iii) Next 10 kilolitres @ BWP 18.20	BWP182.00	BWP21.84	BWP203.84
(iv) Next 15 kilolitres @ BWP28.00	BWP420.00	BWP50.40	BWP470.40
(v) Above 40 kilolitres @ BWP35.00 (last 5 kilolitre)	BWP175.00	BWP21.00	BWP196.00
Total	**BWP898.50**	**BWP105.72**	**BWP 1004.22**

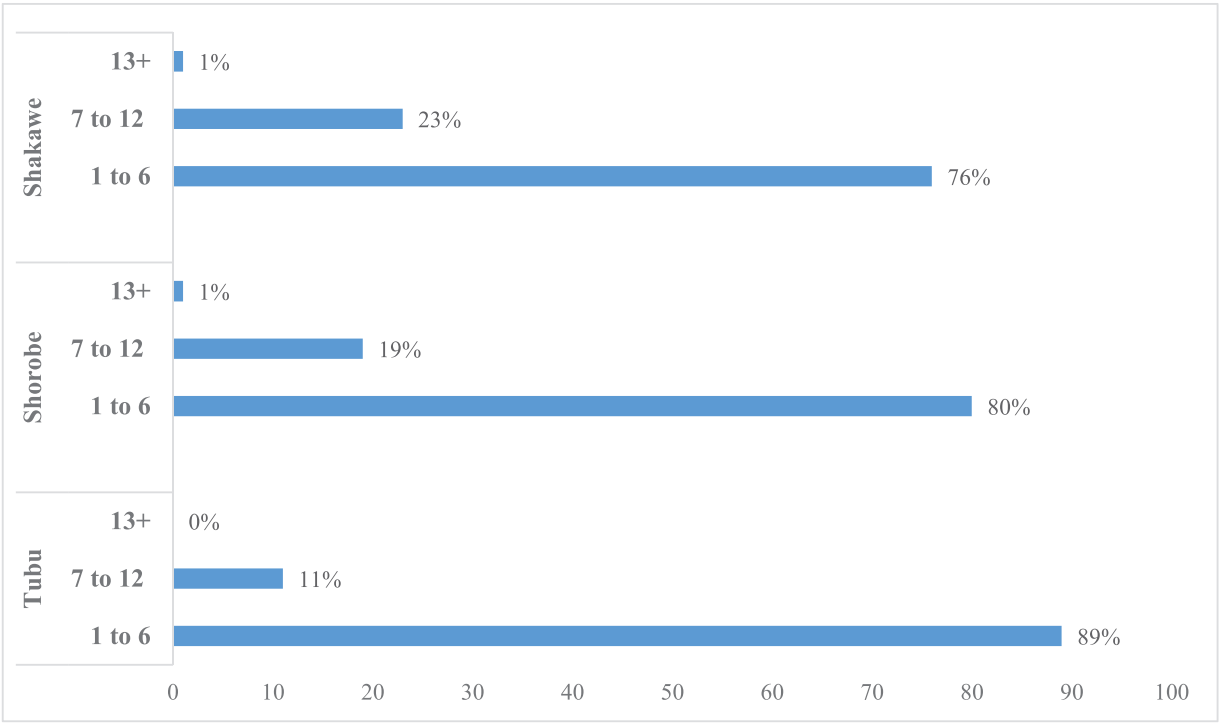

Fig. 5. Household size in the study area (n = 455). Source: Field survey, 2018.

Table 6 shows the amount of money that a household which uses 45 kilolitres of water pays at the end of one month. Given that the majority (90.5%) of the households earn less than BWP1500 per month, paying BWP 1004.22 towards water is too high and as such households could not afford it.

A standard connection fee of up to 50 metres connection distance and WUC digging trenches and providing connection materials costs BWP2000.00. However, this Fig. is reduced to BWP1500.00 if the customers dig the trenches and WUC providing materials and labour. Fig. 7 illustrates the income which respondents earned per month (in Pula) in the study area. Data showed that the average monthly income was P603.96 with a standard deviation of P695.05. The majority (90.5%) earned P1500 or less per month (Fig. 5).

Fig. 8 shows an average consumption rate of 75.4 litres of water per household per day with a standard deviation of 37.3. The results also show that most (54%) of the respondents consumed an average of 80 litres of water per day per household. Based on Cleaver's [12]bricolage theory, institutional arrangements need to be cognisant of existing local conditions to enhance the incorporation of the views and aspirations of the local people in natural resources use. In the study sites, the majority (90.5%) of the people earn less than BWP1500 per month and most (54%) of them consumed over 80 litres of water per day per household. The inference is that most people in the study area were unable to pay for water even though they were willing to pay.

Based on United Nations' (UN) report (2019), one member of the household needs at least 50 litres of water daily. An analysis of the results of this study shows that 21.1% of the respondents lived in households where they used less water than the prescribed amount per day. This implies they used less water than the minimum recommended by United Nations. A study by Rostapshova *et al.* [69] reveals that almost two in three people lacking access to clean water survive on less than US$1 a day. People living in rural areas pay 5 to 10 times more for water than those living in high-income areas [65]. Thus, the reason why 21.1% of the respondents consumed less than the minimum volume of water required per day might

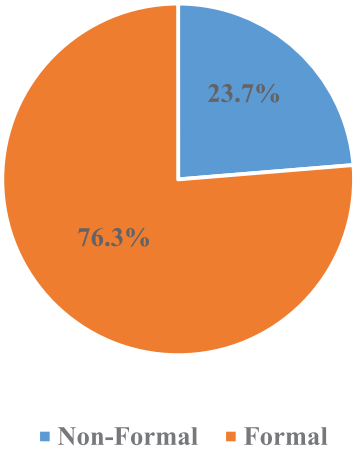

Fig. 6. Distribution of household heads by education type (n= 455). c Source: Field survey, 2018.

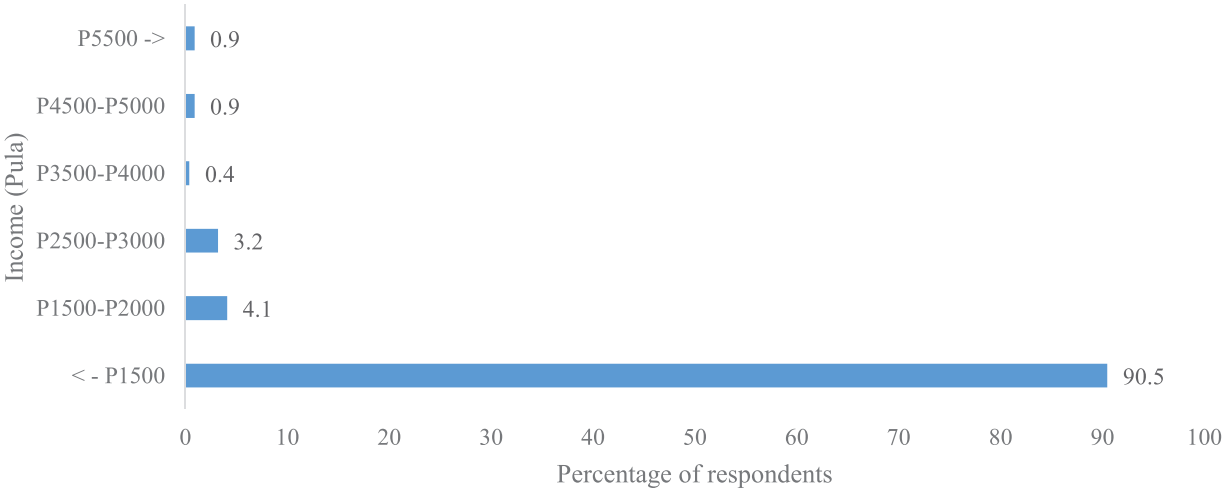

Fig. 7. Monthly household income (n= 455). Source: Field survey, 2018.

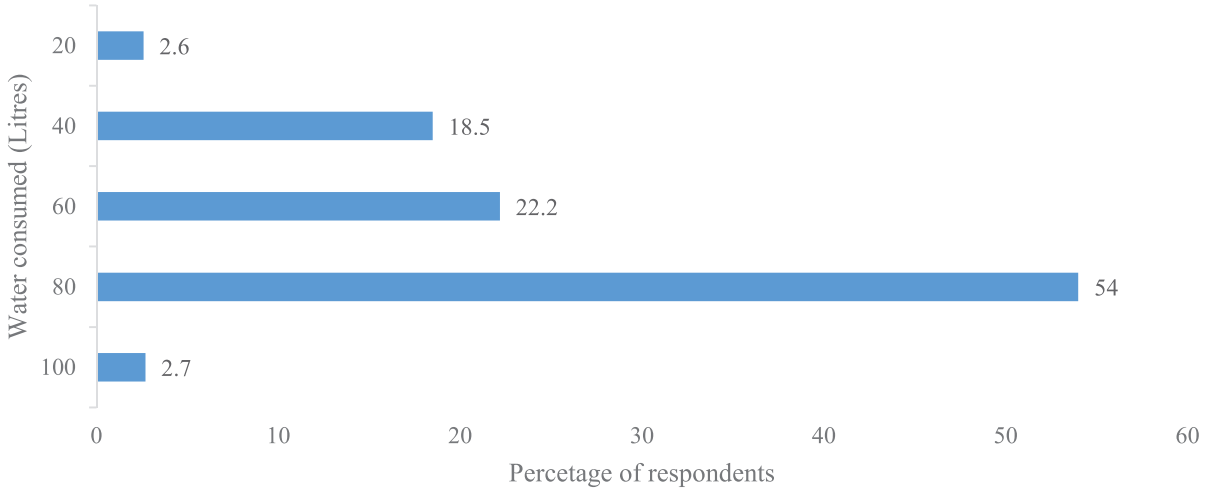

Fig. 8. Daily water consumption in the study area (n = 455). Source: Field survey, 2018.

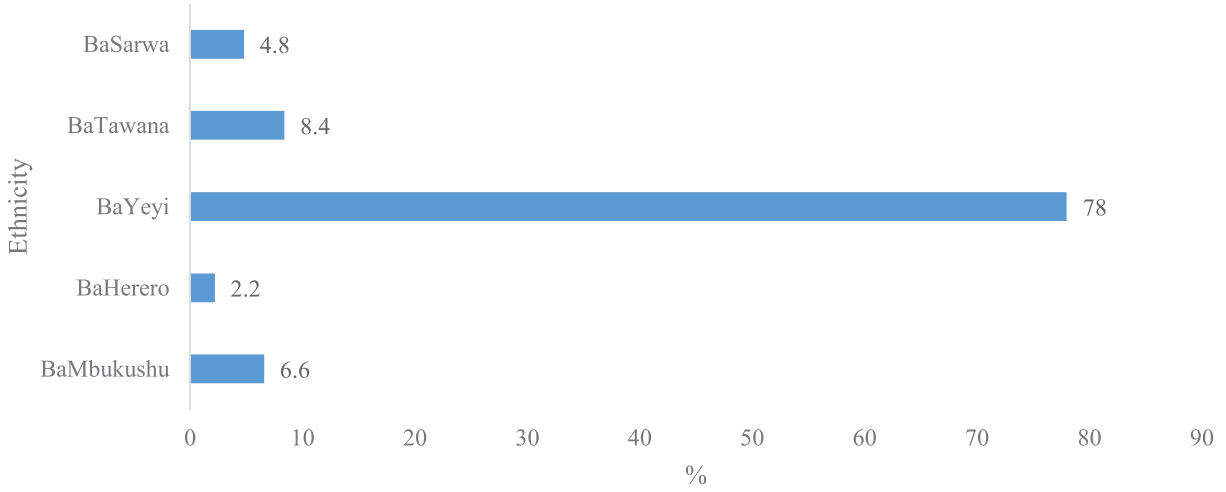

Fig. 9. Ethnicity of household heads in the study sites (n = 455). Sources: Field survey, 2018.

be that they could not afford to pay for more water. In such instances, the customary institutions standpoint is that there is a tendency that the meaning of water as a common good might be completely eroded.

4.9. The relationship between religion, ethnicity and cultural perceptions of water management

Ethnicity is a social classification of people based upon their shared cultural characteristics and heritage [9]. The identity of a certain ethnicity is based upon characteristics of beliefs, values, language, religion and traditional experiences of an individual [9]. Based on Smith and Ali [77] it is extremely unwise to exclude social-cultural variables in the endeavour to understand factors affecting water governance. Findings revealed that there were five ethnic groups (see Fig. 9) and three main religions in the study area. A Chi-square test (X^2) for independence was used to determine the association between the ethnicity of respondents and their religions. The results indicated that there was no association ($X^2 = 9.96$, phi = 0.15) between ethnicity and religions in the study area. A Kruskal-Wallis test was performed to test if there was a difference in perceptions on cultural issues on water management among household heads of different religions in the study area. The results, however, indicated that there was no significant difference ($X^2 = 0.87$, p = 0.25) in their perceptions.

The meaning of water from a religious point of view has practical implications on how it is governed [4]. In many religions e.g. ATR, water is considered a gift from God and is therefore conceived as a community resource to which everybody has access [3]. The ATR position is that it is forbidden to buy or sell water. Personal communication with an adherent of customary institutions in Shakawe agreed with Akpabio's [4]point of view as he says:

> Considering that water as a gift from God has an impact on how people handle it. I should honour and not waste it; if it is a gift to me, then it is also a gift to my neighbour, and I should not deprive him of access.

Thus, the symbolic value of water in religion serves as a concrete motivation for managing water in the study area. Table 7 shows how ethnicity and religion intersect each other. The table shows that 4.8% of the respondents were BaSarwa who participated in this study and that amongst them 3 were affiliated to ATR and 19 were Christians. In total, there were 41 BaTawana who participated in this study, 7 of which belonged to ATR, 34 being Christians and none belonged to Islam and other religions. The majority (355) of the participants were BaYeyi and 54 of them were affiliated to ATR, 295 were Christians, 3 belonged to Islam and other 3 were of other religions outside those listed. Only 1 MoHerero was affiliated to ATR, 5 were Christians and no one belonged to other religions. A total of 31 BaMbukushu took part in this study and

Table 7
Ethnicity-Religion Cross-tabulation (n = 455)

Ethnicity	Religion			
	ATR	Christianity	Islam	Others	Total
BaSarwa	3 (0.7%)	19 (4.1%)	0 (0%)	0 (0%)	22 (4.8)
BaTawana	7 (1.5%)	34 (7.5%)	0 (0%)	0 (0%)	41 (9%)
BaYeyi	54 (11.9)	295 (64.8%)	3 (0.7%)	3 (0.7%)	355 (78.1%)
BaHerero	1 (0.2%)	5 (1.1%)	0 (0%)	0 (0%)	6 (1.3%)
BaMbukushu	4 (0.9%)	25 (5.5%)	0 (0%)	2 (0.44%)	31 (6.8%)
Total	69 (15.2%)	378 (83.1%)	3 (0.7%)	5 (1.1)	455 (100%)

Source: Field survey, 2018.

amongst them, 4 were affiliated to ATR, 25 were Christians and 2 were of other religion other than those listed in the instrument.

The incidence of rituals at water places was indicative of the beliefs in the spiritual importance of water bodies in the study area. A village chief commented that "[w]ater rituals are performed in the dark hours on an individual basis but can be performed at any time when the entire community is involved" (Personal communication, September 2018). The findings are like the results of a study conducted by Shoko and Naidu [73] in Zimbabwe where they found that the ATR holds water as sacred.

4.10. Conclusion

The study used the institutional and mass elite theories to investigate demographic and socio-economic factors influencing water governance in the study area. The results indicated that while the young people showed allegiance to statutory institutions, the elderly upheld customary institutions. Findings also showed that women were responsible for water collection but their control over the water was limited because of customary laws and practices prescribing men as the heads of household and the decision-makers in public spheres. There is a need to consider women's role in water management issues. This will enable the trickling down of reforms that affect ordinary women's access to water and ensure their participation at all levels [81].

Socio-economic variables such as household income and water price have an impact on who decides and how much water to use within a household. The results showed that high-income households consume more water than their low-income counterparts. From the statutory institutions' standpoint, water tariff needs to cover minimal costs. Although the minimum tariff imposed on consumers was unaffordable for the people in the study, tariff is meant to ensure a sustained water supply that the challenge with unaffordability lies is premised on the findings that a majority (85%) of the respondent were unemployed and most (90.5%) of them were surviving on less than BWP1500 per month. Therefore, the government needs to introduce social safety nets, which target women and indigent households to ensure that they can access water at affordable rates. The size of a household also affects the decision on the amount of water consumed. In terms of education and income, households with high education tend to be within the high-income bracket and often had strong intentions to manage water consumption. This is indicated by their desire to install water-efficient appliances. Nevertheless, in terms of actual water use, households with low education and income use less water than their counterparts because they have few water-consuming facilities and gadgets. As water has the attributes of both social and economic good, it is imperative that the government minimises consumer costs by putting measures which ensure that affluent consumers pay more than their underprivileged counterparts (see, [29]). This paper points attention to the need for statutory institutions to acknowledge and adopt the bricolage notion of crafting institutions that are cognisant of contextual local conditions. While there is need for socialisation on onward transmission of customary institutions to young children on the governance of water, policy makers would need to ensure a water governance model that takes cognisance of the complementarity of both customary and statutory institutions. This can be achieved if statutory institutions set the nominal fee, which is within the affordability levels of the rural poor. Given that water from communal standpipes was free prior to 2013 [40], there is need to have communal standpipes from which people could access water free of charge within the study area.

Declaration of competing interest

None

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Chapter 4

Dissonance in customary and statutory water management institutions: issues of cultural diversity in the management of water resources in the Okavango Delta, Botswana

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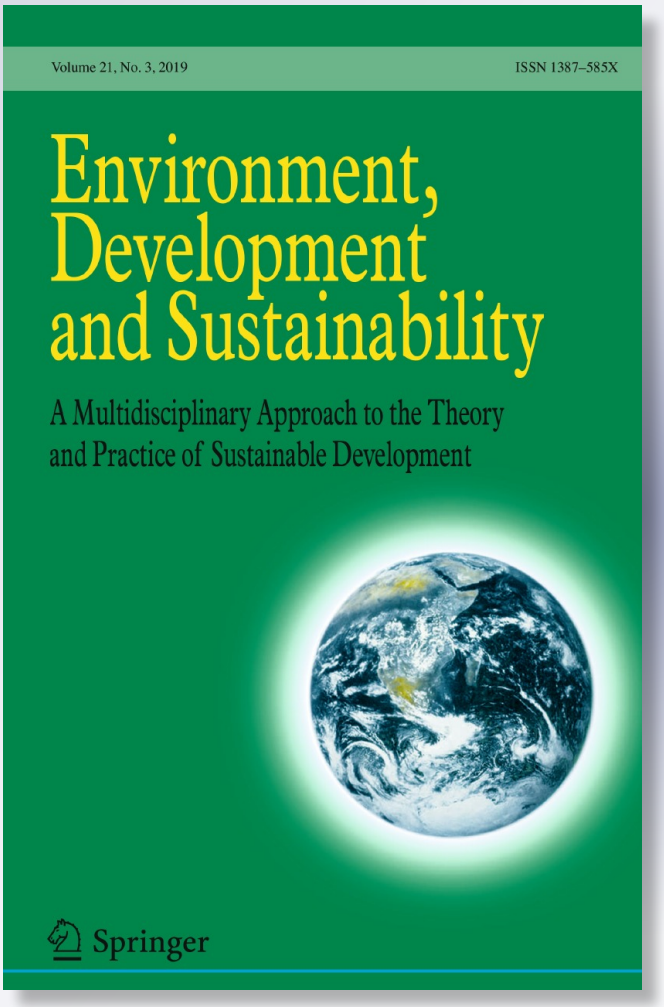

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REVIEW

Dissonance in customary and statutory water management institutions: issues of cultural diversity in the management of water resources in the Okavango Delta, Botswana

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Abstract Customary institutions have existed in parallel with statutory institutions for many years in Africa. These traditional water management systems were employed to manage the use of water resources and resolve conflicts associated with them. Although national governments introduced conventional water management approaches, which operate more effectively in urban areas, customary institutions' activities in water governance continue to exist in rural Africa. Long before the advent of colonialism, most rural communities which have now transformed into modern African societies had various rules, norms, taboos and values governing the use of water. Although not legally recognised in the wake of colonialism, the concept of legal pluralism has continued to gain ground in colonial Africa. Rooted in the mass–elite theory and the cultural lag concept, the paper adopts a critical literature review approach to explain the dissonance in customary and statutory water management institutions in the Okavango Delta, Botswana. Analysis of existing water management documents revealed that the post-independence statutory water institutions continue to weaken the customary approach to water use and management. Findings indicate that statutory institutions emphasise on the economic conception of water despite the fact that the resource has also a social value. This absolute conceptualisation of water as an economic commodity creates the dissonance in water management, especially in rural areas and most especially in the Okavango Delta where water is still perceived to have cultural values.

Keywords Colonialism · Customary · Dissonance · Institutions · Legal pluralism · Statutory

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1 Introduction

The role and place of customary institutions in modern statutory legal systems have been the subject of academic discourse, particularly in countries where traditional legal systems existed before the introduction and imposition of statutory water institutions (Craig and Gachenga 2010). Institutions means a body of rules recognised as binding by any society. A society is said to have a polycentric, pluralistic legal system when it adopts more than one system of rules having different sources, and which in some cases contradict each other (Craig and Gachenga 2010). Customary water institution comprises those sets of rules, norms and taboos established through the process of socialisation, which enables members of a community to establish acceptable from unacceptable behaviour and includes conventions and usages adhered to and followed by people through generations for water use (Craig and Gachenga 2010; Gachenga 2012; Ramazzotti 1996). Despite the recognition of the link between indigenous rights, human rights and sustainable development at international level, its reflection in local-level environmental institutions is still inadequate (Craig and Gachenga 2010; Gachenga 2012). It is thus crucial to deal with human rights through domestic environmental institutions and to recognise indigenous water institution as part of this. Indigenous people have interrelated and unique relationships with the earth including land and water (Ramazzotti 1996), and they do not fragment or compartmentalise their rights and obligations relating to their ecological, spiritual, cultural, economic and social dimensions (Killander 2010). The paper begins by providing the theoretical underpinning of policy institutions in relation to water resource management (Sect. 2). While Sect. 3 highlights the methodological approach of the paper, Sect. 4 addresses cultural and spiritual values of water in traditional societies. Section 5 highlights the intersection of culture, institutions and water management in the Okavango Delta. While Sect. 6 analyses the statutory water management institutions in the Okavango Delta, Sect. 7 identifies the factors influencing the dissonance between customary and statutory water management institutions in the area. In sum, Sect. 8 buttresses the need for the application of a holistic approach in water resources management in the Okavango Delta.

2 Theoretical framework on dissonance in water management institutions

The thrust of this paper is rooted in the mass–elite theoretical framework which originates from the writings of Gaetano Mosca (1858–1941), Vilfredo Pareto (1848–1923) and Robert Michels (1876–1936) (Ostrom 1962; Sebola 2014) and William Ogburn's (1886–1959) concept of cultural lag. In the writings of Sidanius and Pratto (2001), Mosca's main focus is on how the minorities organise and outwit large majorities in the formulation of institutions. Thus, according to Sebola (2014) Mosca believes that there in any society, is a minority group with certain material, intellectual or even moral superiority over others. On the one hand, Pareto (1848–1923) is of the opinion that in a society with truly unrestricted social mobility, the elite consist of the most talented and deserving individuals, but in reality, they refer to those most adept at using the modes of political rule, force and persuasions and who usually enjoy important advantages such as inherited wealth and family connections (Anderson 2014; Sidanius and Pratto 2001; Walker 1966). On the other hand, Michel (1876–1936) regards elite to be the leaders

and experts of an organisation who enable the organisation to operate efficiently and these are people in whose hands power is concentrated (Burton and Higley 1987). On the other hand, Ogburn's concept of cultural lag emphasises the relationship between the tangible and intangible aspects of culture—the material culture (artefacts, textiles, food, music, etc.) and non-material culture (language, philosophies, customs, norms, mores, values, etc.). Ogburn states that the rate of change in the non-material aspect of culture lags behind that of its material aspect (Ogburn 1950), thus leading to a slow response in the alteration of people's mindset and their perceptions about a phenomenon (see Kolawole 2014; Lewin 1947). Invariably, the rate of change happens at a faster rate in the material than in the non-material aspect of culture due to many discoveries and inventions (Godin 2010). While the change in tangible component of culture is visible and pervasive, that of intangible aspect of culture is not easily noticeable and slow if at all it changes over time. Ultimately then, local people are naturally inclined to uphold age-long philosophies, mores, values and traditions, making them to exhibit more preference for their knowledge systems even in a technology-burgeoned environment (Kolawole 2012a). In other words, 'regardless of the degree to which they have embraced modernity, local people continue to prefer the knowledge which belongs to them in time and space…' (Kolawole 2001). It is this cultural delay (Godin 2010), which triggers what we refer to as water management dissonance between the two water management cultures (i.e. statutory vs. customary), each of which embraces a distinct approaches to water management. The seemingly regimented nature of the statutory approach may likely have aggravated the reluctance of the pushers of customary ideals to properly conform to conventional approaches.

Water institutions can be regarded as reflecting the values and preferences of governing elite (Anderson 2014). The essential argument of the mass–elite theory is that public institutions, like the Water Acts, are not determined by the demands and actions of the people or the *masses* but rather by ruling elite whose preferences are carried into effect by public officials and agencies (Anderson 2014; Liu et al. 2010; Sabatier 1991). The theory emphasises that any society is divided into two categories of people, that is, the few who have power and the many who do not (Wallace et al. 2015). While only a few individuals determine what constitute the value system of any society, the poor majority do not have the wherewithal to influence any institutions that affect them. Furthermore, Anderson (2014) and Peet (2007) argue that the few who govern are atypical of the masses that are governed. The elite are drawn disproportionately from the upper socio-economic strata of the society. The movement of non-elite to elite positions must be slow and continuous to maintain stability and avoid revolution (Anderson 2014), and only non-elite who have accepted the basic elite consensus can be admitted to the governing circles (Anderson 2014; McFarland 1987). The elite share a consensus on the basic values of the social system and the preservation of the system. Viewed in this way, water management institutions do not reflect the demands of the *masses* but rather the prevailing values of the elite. Change in institutions then becomes incremental rather than revolutionary (Sabatier 1991). This is because incremental changes permit responses to events that threaten a social system with a minimum alteration or dislocation of the system (Anderson 2014). The elite may act out of narrow self-serving motives (Anderson 2014), or they may initiate reforms, curb abuse and undertake public regarding programmes to preserve the system and their place in it (Liu et al. 2010). More often than not, most reforms arise due to a *crisis situation*, *politics as usual* (Grindle and Thomas 1991: 5) and personal interest (Kolawole 2012b). Thus, the active elite are, in their decision on institutions subject to relatively little direct influence from the apathetic *masses*.

Therefore, viewed from the perspective of the mass–elite theory, water institutions are a conceptualisation of the elite, reflecting their values and serving their own ends, one of which may be a desire to provide in some way for the welfare of the *masses* (Anderson 2014; Sabatier 1991). Thus, the establishment of the current water institutions in Africa is a response of the national elite to the need of a small minority of people rather than a response of the national leaders to the needs of the poor majority on water issues. For instance, the elimination of prior appropriation doctrine from the statutory water management institutions in countries like South Africa, Zambia and Zimbabwe was achieved largely through the dramatic appeals of the middle and upper class (elite) to the conscience of the government.

In summary, the mass–elite theory of institutions making focuses attention on the role of leadership in institutions formulation and on the reality that in any given society, the hapless majority are governed by a few, privileged individuals (Anderson 2014). Thus, whether the elite rule and determine water institutions, with little influence from the masses is, in the views of Liu et al. (2010) and Wallace et al. (2015), a difficult proposition to approve or disapprove. Figure 1 shows the diagrammatic representation of the mass–elite theoretical framework.

The mass–elite conceptual framework (Fig. 1) conceptualises the society (that is, the traditional and modern) as having two worldviews. While the former is mostly rural based, the latter is urban based and is the most dominant. In each of these societies, there exist the elite and the masses. In institutions enactment, the elite formulate institutions despite being in the minority. In the end, the interests of the majority are, in a way, disregarded and excluded in the customary and statutory institutions frameworks. Thus, a public participation policy making model as viewed by Sebola (2014), which encompasses the needs, interests, contributions and ideas of all citizens of a nation, is just a theoretical imagination in institutions making process

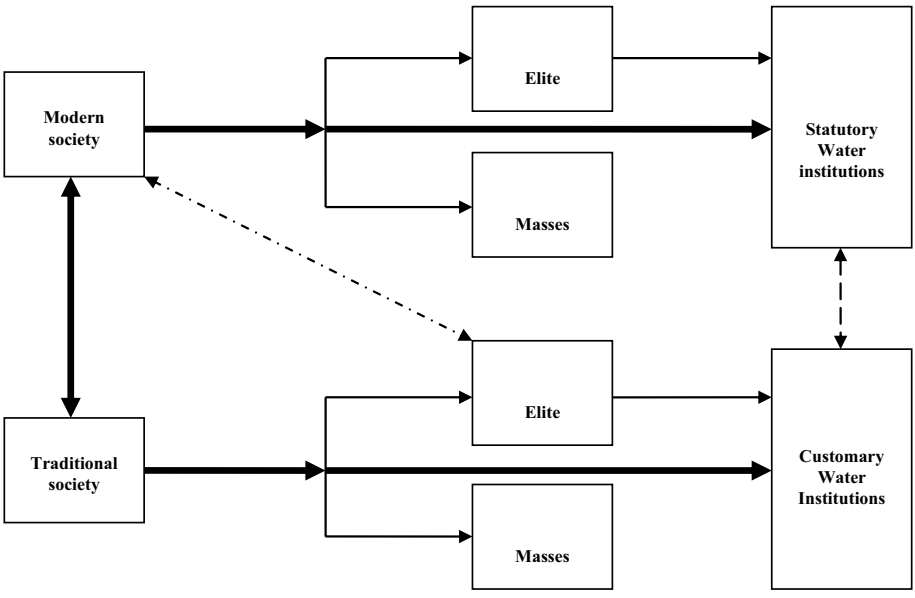

Fig. 1 A conceptual framework of water resources management institutions developed from the mass–elite theory (*Source*: developed by the authors)

of each of the two societies shown in the mass–elite conceptual framework in Fig. 1. At the same time, the cultural lag concept finds relevance in issues of water management between urban and rural areas in the Okavango Delta. In Botswana's urban areas, for instance, water management institutions are mainly the WUC and DWA which derive their mandate from the Water Act (1968) and guided by the Water Policy (2012) in accordance with the 2010 Water Management Plan. In rural Botswana, people are still strongly attached to their cultural modes of water management although they are serviced by conventional institutions which operate in urban areas. Thus, custodians of traditions uphold their taboos, norms and cultural ways of accessing and using water in the Okavango Delta. For instance, water is regarded as sacred and having therapeutic power such that traditional religion devotees claim that they use it to cure ailments and protect property in places like the Tsodilo hills (Segadika 2006) in rural north-western Botswana.

3 Methodology

This paper analyses the dissonance existing between customary and statutory water management institutions with a view to suggesting the harmonisation of the two forms of institutions for effective and efficient management of water resources. A critical review of relevant literatures is used to analyse the dissonance existing between customary and statutory water management institutions. In order to provide an in-depth scrutiny and insights into customary and statutory institutions enactments and their effects on the management of water resources in African countries particularly Botswana, a narrative approach is used by engaging in literature and document analysis. Document analysis is a methodical technique for studying or evaluating both electronic and printed documents (Bowen 2009). In this study, data are explored and examined using various themes related to the dissonance existing between customary and statutory water management institutions. Assigning meaning and providing a broader understanding of the contradictions within the two water management institutions are essential tasks in the analysis of this paper. The electronic database search was done systematically through the use of focused keyword search. Reviewing or searching the literatures in a systematic manner refers to the identification, evaluations and interpretation of available research relevant to a particular research question, or topic of interest (Kitchenham 2004; Kitchenham et al. 2009). The selected keywords include customary water management; recognition of customary rules; statutory water institutions; cultural water management practices; water resources governance; legal pluralism, amongst others. The retrieved literatures included water policy documents for the Republic of Botswana, reports, books, journal articles, etc. The dissonance in customary and statutory water management institutions in Botswana is thus investigated through the selection of appropriate subjects in which the two water institutions are in contradiction with each other. The analytical framework of the study is rooted in the mass–elite theory, which is employed to highlight the dissonance in customary and statutory water institutions in the Okavango Delta. This was achieved by the use of and/or employing the backward snowballing approach of literature identification through which relevant peer-reviewed articles in leading journals were identified and analysed.

4 A global perspective on cultural and spiritual value of water in traditional societies

Usually, people see the intangible value of water, but unfortunately the market systems rarely reflect the true utility of water in this respect (Bauer and Smith 2007). By gaining understanding of these innate values of water, managers and governments might give consideration to the intended social and cultural consequences of their decisions. If water is viewed from a cultural angle, its value is very difficult to quantify, thus making the concept of water utility as being highly intangible in traditional societies (Abrams 2004; Bauer and Smith 2007). Ultimately, the price tag placed on water by the market actually limits our understanding of its cultural values. In order to highlight the significance of water as it relates to cultural and spiritual use, this section provides a summary of the non-tangible value of water to various people all over the world. The thrust is to provide an insight on how indigenous communities view cultural and spiritual value of water and how this might help in guiding policy formulation in water resources management.

The literatures have shown that worldwide, the essence of water in a given culture is its being a force of life often representing the presence of a higher power (Russo and Smith 2013; Bauer and Smith 2007; Bowker 1997; Espeland 1998). According to Bauer and Smith (2007) and Russo and Smith (2013), there are two major reasons why water serves as a crucial resource in the practice and beliefs of many cultures. Firstly, the belief is that water cleanses and washes away impurities and pollutants. Secondly, water is considered a primary building block of life. In this cultural view, rivers are life giving in the physical realm, thus water gains a spiritual value. It is from this basis that the desire to include water as part of worship and traditional ceremonies became woven into the culture of many societies worldwide (Espeland 1998). For instance, Bauer and Smith (2007) note that Egyptians believe that water is the fundamental element in creation. Thus, in Egypt's traditional belief, only water was present in the beginning (Espeland 1998; Russo and Smith 2013). Indeed, the cultural importance of water is a universal commonplace. In France, for instance, a temple dedicated to the goddess *Sequana* is located at the source of River Seine, and the Marne River got its name from *Matrona*, meaning *Divine Mother* (Abrams 2004; Bauer and Smith 2007). In the same vein, the ancient name of the present day River Thames in England is *Tamesa* denoting a river god (Bauer and Smith 2007).

In the realm of religion, there is a link between various cultures, no matter how diverse the belief system is (Russo and Smith 2013). The literatures have shown that in both more economically developed countries (MEDCs) and least economically developed countries (LEDCs), traditional cultures embrace similar spiritual values in relation to water (Bauer and Smith 2007; Bowker 1997; Espeland 1998). Understanding the satisfaction, which different traditional societies derive from water, would go a long way in helping policy makers to better appreciate people's needs regarding water access and uses. We delve into certain aspects of selected religions and analyse their worldviews about water. In India's Buddhism religion, water is used in funeral ceremonies (Abrams 2004; Bauer and Smith 2007), where monks fill bowls and pour it over the grave reciting '*…as the rains fill the rivers and overflows into the ocean, so likewise may what is given here (life) reach the departed'* (Abrams 2004; Bauer and Smith 2007). In the Chinese traditional culture on the one hand, the value of water can be found in many aspects. In the *Fengshui* culture, for instance, water is used in shrines and burial sites (Russo and Smith 2013). On the other hand, *Shinto* is a traditional Japanese cultural practice which is based on the veneration of *kami*, the deities believed to inhabit water bodies

like springs, rivers, seas and oceans (Abrams 2004). The worship of *kami*, whether public or private, always begins with the important act of purification with water (Espeland 1998). Thus, in Japanese traditional cultures, troughs of water, which are meant for ritual washing are placed inside many sacred shrines (Bauer and Smith 2007). In Shinto cultural belief, waterfalls are believed to be sacred and standing under them is believed to provide purification (Bowker 1997).

Also in Hinduism cultural belief, water plays an immense value for community well-being. Hindus follow a morning ritual of cleansing that is also a basic obligation of Hindus worship and its devotees (Bauer and Smith 2007). Central to this cultural practice is the idea that one should take a bath before entering a temple (Espeland 1998; Russo and Smith 2013). Thus, in so doing the Ganges River plays a central role to Hinduism culture and belief. Hindus believe that bathing in the Ganges River washes away one's impurities (Bauer and Smith 2007). It is for this reason that the Ganges River is also called God's divine vehicle and the saviour of the world (Bowker 1997). Furthermore, Hindus cast the ashes of their dead in the river in belief that this will guide the souls of the deceased straight to paradise (Abrams 2004). In Judaism, ritual washing occurs with simple washing of hands and feet or total immersion (Bauer and Smith 2007; Russo and Smith 2013). Also the biblical Noah is believed to have survived the divine punishment of the *Great Flood* because of his good moral values (Abrams 2004; Espeland 1998). In another vein, the Red Sea is prominent in the Jewish culture because it served as a safe passage for the exodus of the Jews after they left Egypt (Bauer and Smith 2007). According to Bauer and Smith (2007) and Russo and Smith (2013), the parting and crossing of the Red Sea shows that God has power over nature, even the mighty oceans. Water here is powerful, but an instrument of God for punishment (for the Egyptians) and a blessing (for the Israelites) (Bowker 1997). In Islam religion and culture, water is also important for purification as Muslims must be ritually pure before approaching God in prayer (Abrams 2004). Thus, some mosques have a courtyard with a pool of clear water in the middle and most mosques house bathing areas outside the walls (Bauer and Smith 2007). Fountains, which symbolise purity, are also found in mosques (Abrams 2004). Today many Muslims accept that recycled water can be used not only for agricultural and industrial purpose, but also for cleansing purposes as long as its taste, colour and smell have not changed (Russo and Smith 2013).

In Christianity, the use of water for worship and in ceremonial rights has changed over time. As early Christians believed that the use of water for spiritual purposes was a pagan practice, early Christians banned the spiritual worship of water in Europe (Bauer and Smith 2007). Despite the ban, people's deep faith in the sacredness of water persisted and old customs were absorbed into modern day Christianity rituals and water worship hid behind Christian facade (Bauer and Smith 2007). Thus, water maintains its sacredness in rituals of baptism and hand washing. Today almost all Christian churches or sects have an initiation ritual involving the use of water. Baptism has its origins in the symbolism of the Israelites being led by Moses out of slavery in Egypt through the Red Sea (Russo and Smith 2013). This symbolism further emanates from the baptism of Jesus Christ by John the Baptist in River Jordan. Baptism, is therefore, generally regarded as a *sine qua non* in different denominations within the Christendom. It is believed within all Christian faith, except Catholicism, that baptism does not in itself cleanse one from sins, but it is a declaration of a person's faith in Christ (Bauer and Smith 2007). Thus, from the literature, the non-tangible uses of water in Christian symbolism is important because it indicates that just as people need water for washing and survival, Christians need God and it symbolises that everything is immersed in Him.

In the USA, water has had a cultural value amongst the New Mexicans for many centuries. In New Mexico State, water has a significant cultural value apart from its importance as an economic value amongst the aboriginal Indians. As subsistence farmers, aboriginal Indians keep cattle and grow crops in *Pueblos* (rural villages built by their ancestors) (Brown and Rivera 2000). The community value of water is reflected in physical structures, that is, the hand-dug ditches (known as acequias) through which water flows to all parts of their settlements and social structures. Field crops are irrigated by water diverted from the nearby sources and carried through a network of acequia. Indigenous people of New Mexico revere water as sacred substance—the life blood of society. To show this, seasonal changes in rainfall and river flows are observed through rituals, dance and feasts (Hutchins 1928). Each year, villagers come together at the acequia to clean it during an annual event. Thus, acequias cleaning promotes community responsibility for the water source. In New Mexico, acequias construction and maintenance have been a shared responsibility amongst the indigenous people. Acequias culture demands that villagers work together to ensure equitable and reliable water supply. During ditch cleaning, cultural traditions are revived, beliefs are shared, and young people are infused with sense of their culture (Brown and Rivera 2000). As people gather to clean the ditches, stories are told and passed from generation to generation. Thus, the socialisation processes that accompany ditch cleaning helps shape and reinforce the local water culture. It is a taboo for women to clean the ditch. The general belief is that bad luck will befall their area (in the form of longer winters and shortened growing season) where women are allowed to do ditch cleaning (Brown and Rivera 2000; Hutchins 1928). The importance attached to ditch cleaning is influenced by people's age. While the old generations regard ditch cleaning as a community activity which links them to their forefathers and a means through which water is supplied to their crops so as to earn a living, the younger generation does not consider this cultural activity as significant and at times perceives it as just a temporary job (Brown and Rivera 2000).

All things considered, the New Zealand water governance model appears to be a laudable approach to integrative water management. In New Zealand, governance of water has undergone significant restructuring in the past two decades, with wide ranging modifications. The revival of indigenous Māori customary rights led the government to recognise and incorporate customary water management institutions into statutory institutions within the New Zealand society, particularly that of Māori Ngai Tahu tribe in the Canterbury region of south island in New Zealand (Memon and Kirk 2012). In line with the Treaty of Waitangi (1840), the realisation of the injustice meted on Māori indigenous people by the White settlers (by way of dispossessing them of natural resources and thereby impoverishing them) was evoked (Harmsworth et al. 2016). Thus, the uniqueness of New Zealand water management framework is taking into cognisance the perceptions of the Māori tribe, which emphasise cultural and spiritual beliefs in the realisation of their well-being, thus interlinking the physical and spiritual realms of water with statutory institutions. As such, access to water in Canterbury region of New Zealand is governed by both customary and statutory institutions and water is free to every individual be it in urban or rural settlements (Kanwar et al. 2016; Memon and Kirk 2012). By and large, customary and statutory water institutions have an equal say in the management of water. Here, the basic tenets of the traditional Māori society are still very strong and influential in relation to access and use of water in both rural and urban environment.

5 The intersection of culture, institutions and water resources management in the Okavango Delta

This following section focuses on institutional structures in the management of water resources in Botswana. It specifically highlights the traditional water management institutions in the Okavango Delta, followed by the statutory water management institutional structure in the area. Figure 2 shows the nexus in customary water management institutions.

The organogram shows the customary institutions involved in water management in the Okavango Delta. At the top of the hierarchy is the Chief (Kgosi). With reference to the Chieftainship Act of 1987, a chief is someone who has been designated as such by his tribe which has assembled in the *kgotla* in accordance with customary institutions and has been recognised as a Chief by the Minister of Local Government, who is responsible for traditional leadership (Republic of Botswana, 1987). The Deputy Chief assists the Chief in administrative matters. Next on the organogram is the Senior Chief Representative followed by the Senior Chief and then the headmen; there are headmen of records and the others for arbitration. The Chief is the head of district and is based in the District Capital (Kgathi et al. 2006). Although the traditional institutions of chieftainship and related structure were retained in Botswana after independence, a lot of modifications have been made. Some scholars have acknowledged that the institution provides the legal cornerstone for the recognition and function of traditional leadership (Ifezue 2015; Sharma 2005).

In Botswana, the president has power to appoint, depose and suspend chiefs (Cantwell 2015; Kgathi et al. 2006; Sharma 2013). Worse still, these powers have been vested in the

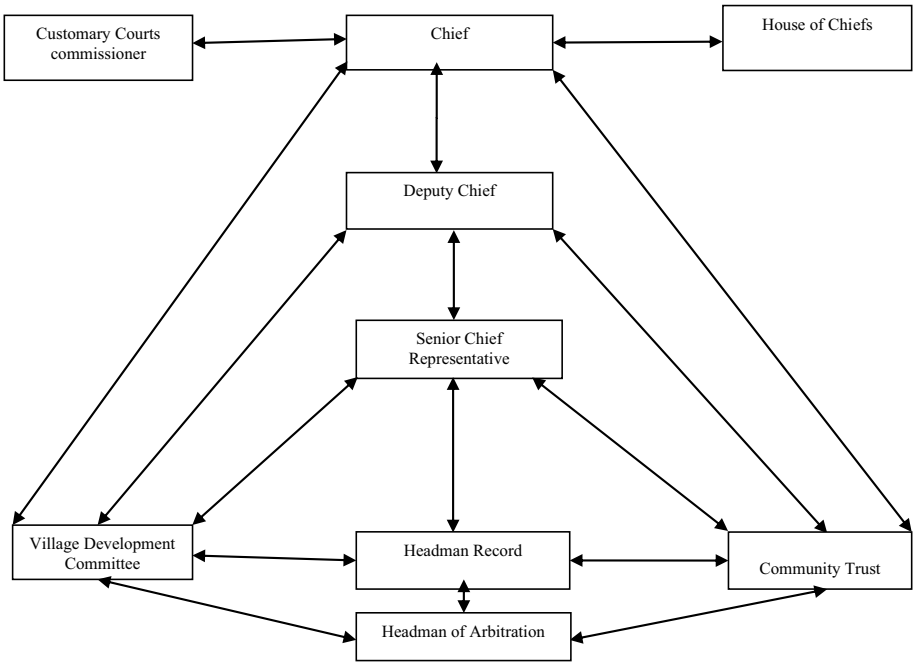

Fig. 2 Structure of customary water management institutions in Okavango Delta, Botswana (*Source*: Kgathi et al. 2006)

Minister of Local Government, responsible for traditional leadership. The power vested in the president defies the customary institutions, which strictly observes and respects hereditary lines in the appointment of chiefs. Given the fact that a minister is a political office holder, it implies that chiefs, who traditionally must be apolitical, end up aligning themselves with the ruling party. As Kgathi et al. (2006) indicate, '[e]very chief is required by law to carry out instructions given to him by the minister'. Any chief who fails to comply with any directive from the minister is liable to suspension or deposition (Sharma 2005, 2013). Automatically this clause as contained in the Chieftainship Act of 1987 reduces the traditional roles of Chiefs to nothing less than a mere civil servant. In the authors' point of view, this is an interference with the traditional roles of chiefs. Since chiefs are supposed to be apolitical in order to serve their tribal people without fear of favour, vesting more powers in the minister than the chiefs makes chieftainship a mere honorary position rather than the executive powers granted to the chief through tribal and ancestral injunctions. The fact that the minister can at any time withdraw recognition from the chief (Sharma 2005) if he/she considers it to be in the public interest to do so, naturally would make the chiefs loyal to the minister and the ruling party. In other words, the government may have treated the chieftainship in a manner that would continue to make all chiefs subservient to the ruling party (Sharma 2005); regardless of how the latter performs. Irrespective of their affiliation with different political parties, Batswana politicians favour the retention of traditional structures as they realise that dismantling those institutions could result in opposition from the grassroots and could create a serious dent in their image within their own support base (Sharma 2005).

Botswana values the role of customary institutions in the management of natural resources especially water, which is a scarce commodity in the country. Although cultural erosion is now witnessed in Africa, customary institutions played a key role during the pre-independence period of the African countries and still continue to play that role in natural resources management (Augustine 2016). But then, as many of the customary roles are now entrusted to local and state institutions, customary institutions are now visibly neglected (Augustine 2016). In other words, there are now many intricacies in the way local authority is discharged because traditional chieftaincy roles in natural resources management, particularly water, have been grossly overlooked, ceding the role to state agencies. While the loss of trust of customary authority by the citizens may have been witnessed, traditional institutions are still highly valued for being the custodian of African customs and values. Some studies done in Botswana on roles of customary institutions in natural resources management have shown that overlapping responsibilities especially in the management of resources like land and water have resulted in dissonance between customary and statutory institutions (Kgathi et al. 2006; Sharma 2005, 2013). However, the general consensus amongst researchers on cultural values and indigenous knowledge systems (IKS) is that traditional institutions are a vital component of natural resources management in their country, although old customary institutions of resource management are not currently and strictly observed (Kgathi et al. 2006; Mogende and Kolawole 2016). Ignoring cultural values could be anti-development in the first place. According to Agyenim and Gupta (2010), the erosion of knowledge is much more serious than the erosion of natural resources. They opine that natural resources can at times be reversed while loss of knowledge is irreversible. In their viewpoint, Kgathi and his team argue that the loss of traditional knowledge systems could lead to disempowerment of the rural poor, serving as a recipe for unsustainable development (Kgathi et al. 2006). Neglecting the role of traditional institutions in the management of water in the Okavango Delta noted for its increasing tourism industrial activities might be a recipe for disaster in the area and Botswana.

Culture is the means by which people understand themselves and can relate their experience, achievements, hopes, desires and fears at the family level to the nation and the world (Denbow and Thebe 2006). It is through culture that people build respect and identity. People communicate their ideas, feelings and insights through culture so as to build mutual understanding. Water could serve as a means of bringing individuals and nations together. The literature has shown that there are a number of cultural practices that the people of Botswana engaged in. These practices show people's orientation as a nation (Ifezue 2015;). Like most African countries, culture is one aspect that drives most developmental activities in Botswana (Denbow and Thebe 2006). We view water as the backbone of the country's economic and developmental activities. Studies by Schapera (1994) and Sharma (2005) have shown that the Batswana society attach high value to rain. There are many ways in which rain or water is culturally celebrated in Botswana. Water in Botswana is used in different rites and ceremonies. When there are prominent national celebrations or key national gatherings to be addressed by the highest official like the President, the slogan '*Pula*', which is also associated with blessings, is chanted (Morapedi 2010; Schapera 1994). This is done in anticipation for more rains which give abundant supplies of water. Furthermore, when a prominent visitor is received, the guest is said to be accorded a special welcome with respect to rain. The expression in Setswana thus goes, '*Goroga kaPula*' which is literally translated to '*arrive with rain*' (Ifezue 2015). In Tswana culture, when drought persists for too long or when the rains delay beyond the usually expected season, traditional ceremonies are conducted and the congregation members chant '*Pula! Pula! Pula!*' while looking to the heavens (Denbow and Thebe 2006) for the showers of blessings. This is done in anticipation for cloud formation.

Amongst the Hambukushu tribe, ancestral spirits are approached around a sacred fire (*okuruo*) (Denbow and Thebe 2006). Like any other African ethnic groups, the Hambukushu of Botswana pray to ancestral spirits rather than to God (*Ndjambi*) who is seen as a more distant figure associated with the clouds and heaven (Denbow and Thebe 2006). In some areas amongst the Hambukushu tribe, a mound of stones are believed to be inhabited by spirits and those who pass by are expected to add a stone to the cairn to show a sign of respect (Denbow and Thebe 2006). The Hambukushu people live along the waterways of the Okavango Delta, and they place considerable importance on the spiritual connection with their ancestors. The people believe that there are some individuals who are rain makers. These are renowned for their ability to make rain which is a precious commodity for farmers in the peculiarly dry environment (Denbow and Thebe 2006). Rain makers enjoy significant religious and political authority amongst their own people (Schapera 1994). Amongst the Tswana people, traditional religious beliefs often inform the events, actions and practices of contemporary life. The literatures have shown that there is a general belief amongst the rural folks of the Okavango Delta that ancestors (*badimo*) participate in the daily affairs of the living and are now taken for granted as a matrix within which life is lived and understood (Denbow and Thebe 2006; Morapedi 2010).

6 Statutory water management institutions in the Okavango Delta, Botswana

This section offers analyses on the statutory water management institutions in the Okavango Delta.

Figure 3 shows the statutory water management institutions in Botswana. The Water Works Act (1962), on the one hand, provides a provision for gazetted water works areas, where designated water authority, e.g. WUC who has the right to take, construct, make, purchase or take over all water works within the boundaries of the (water works) area and is also responsible for water supply. According to this act, water charges should be related to the water consumed and metered readings need to be used. It empowers the minister responsible for natural resources management to approve water charges. The Water Act (1968), on the other hand, governs the use of water in the country. According to this act, public water is owned by the State and every Motswana has the right to water for drinking, washing, cooking and livestock (Water Act, 1968). In that scenario, there is no water right required by individual users. However, a water right is required if one wants to extract, divert, store and discharge effluent into public water (Water Act, 1968). The possession of water rights does not necessarily mean that the amount of water is always available. There are provisions to cancel the water quota as granted in the water right if the available water resource does not meet current demand and if the right is not used within three years (Water Policy, 2012). Based on the Boreholes Act (1956), permission to develop a borehole should be sought from the Geological Surveys (GS) authority. The GS keeps a registry of boreholes in the country. The department can, at any point, access any borehole for inspection, water sampling, pump tests and is expected to keep records of this transparency for the government (DWA, 2011).

The Water Utilities Corporation (WUC) Act (1970) mandates WUC for bulk water supply or in water works areas where it has a statutory authority. The WUC is empowered by this act to take necessary measures to ensure adequate water supply *in areas of operation*; the act mandates the corporation to operate commercially and generate revenues for the agency. While the act is a good piece of institutions, the main challenge is that it was enacted in the 1970 s when there were designated areas to which the corporation should supply water. However, the WUC's change of mandate to supply water

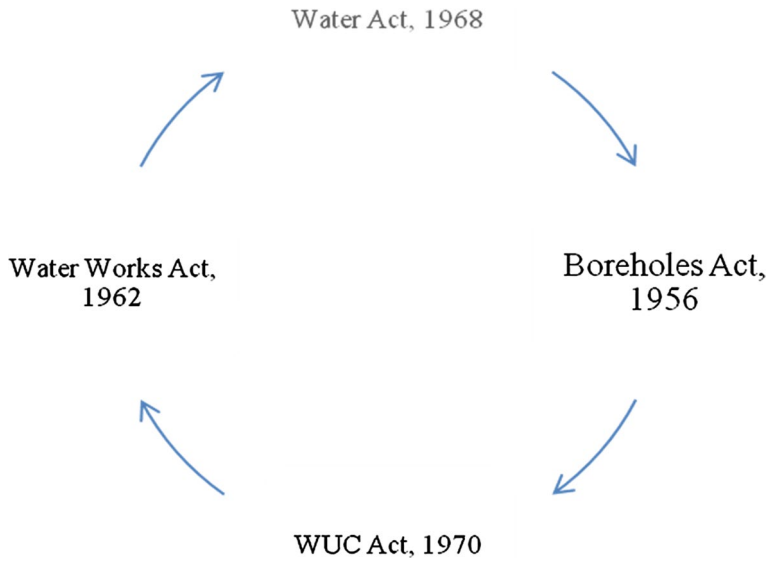

Fig. 3 Statutory water management institutions (*Source*: developed by the Author)

to all settlements in Botswana is not legally binding because the workings of the WUC Act (1970) still remain unaltered; it has outlived its time. However, the Water Acts as earlier outlined above have a number of weaknesses. As they were enacted in 1968 and beyond, it implies that they do not provide for integrated water resources management and current issues like climate change are not addressed. They also place little emphasis on water pollution. The population of Botswana was low in 1968 (650,835 people), and to ignore pollution issues now when the population has increased to 2.2 million people would be disastrous (Botswana Statistical Year Book 2012/13, 2015). Furthermore, there is no provision for management of shared water courses; the acts are not in line with the Southern Africa Development Community (SADC) protocols. The monitoring and enforcement of water use are inadequate. The penalties for non-compliance were pegged in 1968 and were high by then but have not been adjusted and are now very low. For instance, a person who is guilty of an offence under section 9 (2) and 36 (1) of the Water Act (1968) is liable to a fine not exceeding P1000 or imprisonment for a term not exceeding 1 year or both (Government of Botswana, 1968). While the duration of imprisonment for offender sounds good, it is the fine associated with the offence which needs an urgent revision. Also in addition the penalties which may be imposed by the court in the event of a continued offence, the court may impose a fine not exceeding P10 a day during which the offence continues (Government of Botswana, 1968). The amount attached to this fine is by far too low and less stringent as a punitive measure for water use abuse. There is also lack of integrated planning in land and water resources allocation.

Most importantly, the Water Acts may not have adequately taken into consideration the needs and values of the people in rural areas. Indeed, the act is silent on the role of indigenous knowledge (IK) in the management of water especially in rural areas such as the Okavango Delta. This is in spite of the 2007 Declaration on the Rights of Indigenous People, which affirms the right of indigenous people to self-governance through the use of their customary institutions systems (Killander 2010). Ethnic minorities in rural areas are noted for their possession of IK which if incorporated into statutory institutions would enhance effective and sustainable water management in the rural areas (Kolawole 2015; Mogende and Kolawole 2016). Furthermore, inclusion of customary institutions in statutory institutions and the application of IK in water management can assist in setting the scientific baseline for environmental and cultural flows through the establishment of standards and targets, as well as having a role in regulatory enforcement (Maganga 2003; Sage and Woolcock 2006). The integration of the two forms of institutions is important as national decisions on water would be more active, equitable and sustainable because informed decisions (with inputs from those who are knowledgeable about land and water resources) would have been made in the first place.

Another piece of statutory water management institutions worth mentioning is the National Water Policy (NWP). Throughout the formulation and implementation of the policy in 2012, three essential guiding and overarching principles were applied (Republic of Botswana National Water Policy 2012). These principles are equity, efficiency and sustainability. The nation's water resources are characterised by wide spatial variability, extreme scarcity, high dependency on internationally shared and transboundary waters. Most of the water is located in the north-west far from the population centres in the eastern corridor. One most important factor in Botswana's water sector is that all of the country's five major drainage basins are shared (Republic of Botswana National Water Policy 2012). As it is the case all the time, the Water Policy of 2012 is also silent on the role of customary institutions in water management and there is nothing about IK in the policy.

While some scholars (Coulter 2010; Fromherz 2008; Maganga 2003) acknowledge that in other African countries like Ghana, Nigeria and South Africa, contemporary statutory water management institutions have taken various approaches in their attempt to give recognition to customary institutions in a broader context of water management, indigenous water management practices are, however, often regarded as second-order rights to be assessed through broad policy objectives after statutory institutions have been guaranteed or assigned their more concrete rights. While this is at least a starting point, however, this paper is advocating for a more appropriate minimal approach which would try to identify the range of options for statutory provisions to better recognise customary institutions for contributing effectively to economic livelihoods of indigenous people in the Okavango Delta. But then, an approach in which provisions would allow for the incorporation of customary institutions in statutory water institutions is arguably still inadequate because it emanates from a one-sided statutory approach (Craig and Gachenga 2010). The most appropriate approach in the authors' perspectives would be to involve, to a greater extent, the recognition of a pluralist legal water system. In this proposed paradigm (which allows for two or more forms of institutions to operate within a given society), it is suggested that Botswana might have two water management regulations, one under customary institutions and the other under statutory institutions. The advantage of this approach is that it recognises both customary and statutory water institutions on an equal basis. If understood on this basis, customary water institutions may not necessarily assume a subordinate role in the process of water management.

7 Dissonance between customary and statutory water management institutions

This section compares customary institutions with statutory institutions with a view to highlighting the dissonance which exists between the two genres of water management institutions. African water institutions are usually unwritten, while all statutory institutions and legal systems are recorded (Latham and Chikozho 2004). They vary from district to district and even within the same district (Chikozho and Latham 2005). It is these variations which make it difficult to make a compilation of the existing institutions in order to apply them uniformly within the country. Customary water institutions are directly validated by community acceptance while statutory codes are validated by institutional enactment, case law and judicial precedents (Goldin and Gelfand 1975). The written and codified nature (Muyambo and Maposa 2014) of statutory water institutions makes it the preserve of professionals who engage in the esoteric work of interpretation, application and creation of rules (Latham and Chikozho 2004). On the other hand, African customary water institutions are easily identified with by Africans because they are passed from one generation to the other through oral traditions (Augustine 2016). African customary courts are open to all, and there are no stringent rules for court attendance. This is because it is easier to use and improve one's product than others (see for instance, Kolawole 2001, 2015). The advantages of customary institutions lie in the cost of administering it; customary water tribunals are cheap and lawyers are not permitted to practise in customary tribunals (Kane et al. 2005), thus eliminating a major expense. In customary institutions, litigants do not have to travel a great distance to access them because native courts are situated within local communities. Most of the structures of statutory institutions tend to be

situated in major urban areas, and statutory courts are not commonly found in remote areas where most people live.

Also, the language codes used in the customary institutions are easily understood by the people involved. This contrasts with the statutory institutions where the language of proceedings tends to be highly technical English which cannot be easily understood by the majority of the people living in villages or even those in urban areas. While procedures used in customary tribunals tend to be simple and clear, statutory institutions procedures tend to be too complex and seemingly archaic. According to Hook and Raumati (2011), the institutions applied in customary tribunals can counter-intuitively be more 'modern' and relevant than the written statutory institutions. This happens when the legal framework and institutions in the statutory legal and judiciary sector become obsolete and out of tune with modern jurisprudential and socio-economic developments, and where governments are too strained for resources to undertake the vast work involved in legal reform (Hook and Raumati 2011; Kane et al. 2005). In Botswana, for instance, the Water Act dating as far back as 1968 is still being used in the country's water sector. This is despite the fact that even colonial Britain has updated some elements of the Water Act or struck them off altogether from the act. Since customary institutions are organised at the grassroots and informal level, they are much less vulnerable to national disaster (e.g. national institutional failure). As they are closer to the people, confidence in customary legislative structures may persist even in times of crisis or during a breakdown of confidence in the statutory structures. This argument finds relevance in the proposition that the development of local knowledge is ecologically induced and is easily adaptable to local contexts (Kolawole 2015).

In general, customary tribunals tend to encourage decisions that are restorative (Mtisi 2011). For instance, fines or compensations tend to go to the aggrieved party, even in criminal cases. This type of restorative justice is very appropriate to the needs of the poor people and tends to rebuild community relations unlike statutory judiciary which is largely adversarial (Kane et al. 2005). Also fines imposed by statutory courts go to the state rather than the individual. This paper further pushes for the use of customary institutions in water management because of their flexibility in relation to time and space. In Botswana, customary water management institutions make little distinction between criminal and civil law. All litigations were and are still aimed at reconciliation. In African customary institutions, compensation for the injured parties is the prime objective rather than punitive measures meted on the transgressors as in statutory institutions (Chikozho and Latham 2005). The objectives of traditional courts or tribunal in African customs are to reconcile the disputants and maintain peace rather than to punish the wrongdoers (Goldin and Gelfand 1975). As many local people are financially poor (Kolawole 2015; Morapedi 2010), it is therefore contextually rational for them to identify with and use local products (in this case, customary institutions) which are relatively more suited to local conditions (Kolawole 2015) as against the foreign statutory institutions, which have western traditional connotations and orientations.

8 Discussions and conclusion

This section discusses the synthesis of the review of dissonance existing between customary and statutory water management institutions in Botswana. The review reveals a number of interesting observations in water management. To begin with, the general consensus amongst scholars whose works have been reviewed is that customary water management practices are considered as irrelevant, even though there exist both customary and statutory

water management institutions which scholars have conceived as legal pluralism. It has been shown that customary institutions are not written, but are only agreed upon by tribal groups. These are transferred from generation to generations by word of mouth. In Botswana, like in any other African countries, customary water management institutions have been dominated by statutory institutions, showing the impact of colonialism on IKS. None of the authors reviewed investigated the possibilities of addressing the dissonance in customary and statutory institutions through hybridisation of both systems. And so far, no study has been carried out in Botswana with a view to analysing the perceptions of stakeholders on the dissonance existing between the two forms of institutions, although all of the existing studies seem to have a general consensus on the strategic role of IKS as an integral component of natural resources management strategies (see, for instance, Kaplan 1990). Results of review of dissonance existing between water management institutions have shown that management of natural resources like water under customary institutions is based on the belief that all resources including water are owned by ancestral spirits. This belief has been shown to be very strong amongst rural folk who believe that water sources such as rivers and lakes are sacred as they serve as abode to ancestral spirits.

In Botswana, statutory water management institutions cover Water Policy (2012); Water Utilities Act (1970); Water Act (1968), Water Works Act (1962) and Borehole Act (1956). However, while Botswana's Water Policy (2012) is new, the main anxiety about its appropriateness is the fact that the Water Acts is too old and now needs to be urgently reviewed. Currently, the Botswana Water Acts is over 48 years old. It is, therefore, being perceived as out of tune with current issues such as transboundary water management, integrated water resources management as well as climate change issues. One common element in statutory water management is that they are silent on management of water resources using IKS. Findings emanating from the review show that people who live in rural areas depend mostly on natural water sources which are not covered in the Water Acts (1968) and National Water policy (2012). Although Botswana recognises the role of traditional leaders as shown by the enactment of its laws such as the Chieftainship Act and Customary Courts Act, it appears the country is silent on the role of traditional leaders and importance of IK in water resources management.

Another critical issue is the question as to whether or not chiefs should be apolitical. The literature has shown that although all traditional leaders are supposed to be apolitical, the opposite is the case in Botswana. This is because traditional leaders (who are the representatives of their people), for fear of being alienated, are now somewhat sympathetic towards the government of the day. This is because the Minister responsible for traditional leadership has been vested with the powers to *hire* and *fire* these traditional leaders. Fearing the possibility of losing their salaries, the traditional leaders have no other choice than to comply with the government's directives at the expense of their tribal people. While traditional societies have indigenous strategies for choosing their leaders, literatures have shown that there are other new or contemporary criteria for selecting traditional chiefs. These include a good command of English, amongst others (Kgathi et al. 2006). It, therefore, suggests that Chiefs are now equated with ordinary civil servants who can easily be hired and fired by the government.

Findings from the literatures do reveal that there is a clear distinction between water ownership and access in rural and urban areas. In rural areas, the locals and ancestral spirits are involved in the governance of water resource. Traditional leaders control and manage the natural resources on behalf of their ancestors, with and from whom they consult and seek advice, respectively. Thus, access to water in rural areas is gained and governed by one's acceptance as a member of the community and the willingness to

respect the ancestral spirits of the locality. It is against this backdrop that the water in rural areas is viewed as a God given natural resource under customary institutions. Indeed, water is viewed in the traditional system of governance as having more than the physical form in which it is found; it also attains a religious dimension, thus becoming that natural resource, which is made available by ancestral spirits through the request of community members (Nicol and Mtisi 2003: 45). While the custodians of water in rural areas are the chiefs and their people, the ultimate owners are the ancestral spirits. Ultimately, this implies that traditional leaders and communal farmers have access to water because it belongs to them and their Ancestors.

The literatures have shown that people living in urban areas view water from a different perspective. Here, the common view is that water is finite. As such, different uses and users compete for it, making it to easily acquire a commercial value. Since water is a vital, life giving resource without which people cannot survive, it may acquire both commercial and political values. Controlling water in urban areas thus becomes a political rallying point. Since water is naturally fugitive, it often requires sophisticated and costly engineering infrastructure to harness it. Ultimately, these three fundamental attributes of water could facilitate the emergence of powerful coalition amongst engineers, financiers and politicians. Engineering firms will be more than willing to apply their skills to ambitious water projects, making them to tend to favour the larger supply-oriented projects as it would generate more work and money. To financiers, a monopolistic water supply system for urban areas would be an attractive investment since the urban residents will always need water for which they are able to pay. Politicians on the other hand are likely to initiate water projects as this all important initiative will automatically portray them as the provider of life giving resource, thus enhancing their political career.

In sum, there is a general consensus amongst scholars that people who live in rural areas are not served by the current statutory water management institutions as they, in most cases, are not provided with water unlike their counterparts in urban centres. It is commonplace that the rent-seeking elite prioritise their values and needs at the expense of the poor and uneducated majority (the masses). By and large, the principles of integrated water resources management as adopted in southern Africa buttress the need for all stakeholders' participation in natural resources governance if only to achieve sustainable water management in the twenty-first century.

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Chapter 5

Institutions and water governance in the Okavango Delta, Botswana

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ARTICLE

Institutions and water governance in the Okavango Delta, Botswana

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ABSTRACT

The goals of Integrated Water Resources Management (IWRM) can be achieved by embracing the principles of distributive governance, which places both customary and statutory water institutions on the same pedestal in the governance of water resources. As culture and traditions constitute intangible aspects of water resources management in rural Africa, the recognition of water governance systems grounded in local norms, which correspond better with the aspirations of local water users as against the expert-knowledge systems is desirable. Following the introduction of the statutory institutions in postcolonial Africa, customary institutions, which were once effective in regulating water resources became relegated to the background in those countries, including Botswana . Adopting a critical literature review approach, this article employs the concept of legal pluralism to analyze the institutional factors that create the disharmony between cultural and statutory water governance and management institutions. Findings indicate that water has been abstracted from its social nature and transformed into a tradable economic good. Ultimately, the local meanings and images encoded in water as a nature-given resource are overlooked, thus generating conflicts in water governance. The paper recommends the adoptions of legal pluralism under which water institutions need to embrace both customary and statutory institutions.

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1. Introduction

Since prehistoric times, indigenous people have governed resources in their localities (Osei-Tutu et al. 2015) and established social institutions as mechanisms to regulate water use (Kapfudzaruwa and Sowman 2009). The colonialists created colonial states and their associated statutory institutions (Gachenga 2012), which led to the centralization of water resources governance. Subsequently, water management became the responsibility of state institutions and the motive was purportedly meant to enhance better water governance even though the motive was apparently to secure revenues for the states (Osei-Tutu et al. 2015). Local people and their customary institutions were subsequently relegated to the background and in some cases criminalized (see Brown and Lassoie 2010), resulting in local resistance against this form of water governance. In the late 1980s, governance strategies that sought to involve local people in officially recognized water governance emerged with the rationale to enhance effectiveness, efficiency and equity in water use (Mohanty 2004; Kapfudzaruwa and Sowman 2009; Brown and Lassoie 2010). However, the results of implementation efforts have been unsatisfactory (Kapfudzaruwa and Sowman 2009), largely because they had introduced expert knowledge systems of water governance in local communities (Ostrom et al. 1994) where the technical, managerial and financial requirements of the expert-knowledge systems were incompatible with local circumstances, resulting in lack of local ownership and strong dependency on external support to function (Pokorny and Johnson 2008). Consequently, several authors have recommended customary institutions for the purpose of recognizing local water governance (see, for instance, Ostrom et al. 1994; Agrawal and Ostrom 2001). Indeed, in some empirical studies local institutions were found to be effective and efficient in regulating use of local resources (Colding and Folke 2001).

In many countries, local customs and religious beliefs have shaped the rules applied to water. Such local rules have been traced back to the traditional life of the indigenes. For instance, local water rules in India were developed and incorporated into the statutory water laws (Naff 2009). This scenario is similar to water governance in China and Egypt where rules for managing floods and promoting irrigation were initially developed locally but later became part of national water law (Roth et al. 2015). While prehistoric water rules focused much on ownership and rights, water

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rules in the industrial revolution era shifted to water quality issues with pollution taking the center stage and up to now, water governance continues to focus on integrated and sustainable utilization of water. The study of water governance has shown that it is not easy to change historically acquired rights and responsibility (Ostrom et al. 1994). Thus, traditional courts, taboos and traditions continues to preside over water management in rural areas in Africa.

Although water institutions are contextually shaped, literature has shown that African water institutions have six general features (Mehari et al. 2006; Muyambo and Maposa 2014; Osei-Tutu et al. 2015). Firstly, the institutions have a cultural origin as influenced by the geographical and hydrological conditions that shaped the growth of the early civilization along riverbanks. In general, regions that were water rich had little need to develop rules, while regions with water paucity were compelled to have local water rules. This tendency is still evident in different parts of Africa (see, Mehari et al. 2006).

The second general feature of water rules is the influence of religion. Through the spread of major religions (like Christianity and Buddhism among others) to different parts of the world, water related rules in each religion began to penetrate statutory water legal systems. Resulting from this religious influence is the lack of recognition accorded private ownership of water in some places because water is regarded as a fugitive social good. As noted by Dellapenna and Gupta (2008), this perspective of water elusiveness emanated from the African Traditional Religion (ATR) and borrowed by Hinduism and spread to Christianity. Among some sects of the major religions, water cannot be commercialized because it is a gift from God even though limited ownership is recognized where individuals have taken specific measures to create access to water, either through the digging of wells or provision of treatment plants. In Islam rules concerning water bear a religious characteristic because Islam arose in an arid region. In Islam, the equivalent word for law is sharia meaning *path to the watering place* (Naff 2009). Nonetheless, the Roman laws which were developed in a relatively water rich areas allow personal ownership of water. Consequent upon this, countries which ascribe to Roman tradition of water governance recognize three types of water ownership namely private, commercial and public. Thirdly, water institutions in Africa have characteristics that are associated with war conquest and colonization. For instance, countries that were conquered by Islamic Jihadists operate under water institutions governed by the tenets of Islam. Also, water institutions in colonized countries operate under Western secular rules. Yet, in other instances, water institutions promote those ideologies that strengthen state ownership of water. This is the case in Botswana and indeed in all African countries. A fourth feature is the codification of water institutions at the national level. This stage involved the identification of common principles of managing water at both local and national level. This was followed by recording of water laws at both national and international level. The international law Commission was mandated to codify international water law (Woodman 1999). While key features of local rules were codified in international water law, however, this focuses much on transboundary water courses. The fifth feature of statutory water institutions emerged from the epistemic community. Experts with vast knowledge of water science developed scientific concepts of water management. They came up with the notion of diverting water from water-abundant areas to those experiencing water scarcity. While initially these communities focused on developing infrastructure and engineering works like dams, over time their work has shifted toward integrated river basin management. However, some crucial local level water rules have been lost within the context of integrated basin management. The sixth, emerging feature in water governance is globalization, which is not unconnected with the spread of neoliberal ideologies regarding water management and use. In the context of globalization, water is regarded as an economic good as against the notion of customary institutions that considers it as a social good.

With the aim of analyzing institutional factors that create the disharmony between customary and statutory water governance and management institutions, the paper begins by providing the conceptual framework underpinning institutions and water governance (Section 2). While Section 3 highlights the methodological approach of the paper, Section 4 describes the study area. Sections 5 and 6 address the distinction between water governance and management as well as water institutional structure and reforms in the Okavango Delta. While Section 7 analysis customary institutions in water governance in the study area (Okavango Delta), section 8 addresses the issue of water as a social or economic good from a customary and statutory institutions point of view respectively. The last section (Section 9) concludes the paper and makes recommendations for an effective and inclusive water governance and management program in the Okavango Delta in particular and rural areas in Botswana in general.

2. Conceptual framework

This paper is premised on the legal pluralism conceptual framework conceived by Barry Hooker (1975) and Vanderlinden (1989). In their expositions, the status quo where statutory laws are regarded as the only governance institutions is an erroneous assumption which assumes

state laws to be uniform for all persons exclusive of all other edict and administered by a single set of state institutions (Hooker 1975; Akong'a 1988; Vanderlinden 1989; Roth et al. 2015). However, literature has shown that there are within any given society different juridical mechanisms that could be applied within similar contexts (Vanderlinden 1989. Thus, legal pluralism exists whenever social actors identify more than one source of law within a social arena. In this instance, the essential feature of legal pluralism in Africa is the co-existence and usage of statutory and customary institutions in the governance of natural resources (Woodman 1999). Understanding the concept of legal pluralism helps in resolving the dissonance existing between customary and statutory water governance institutions in the Okavango Delta in Botswana (see Gondo et al. 2018). As viewed by Muyambo and Maposa (2014), water allocation, especially in rural Africa, depends much on local rather than statutory institutions. This is because local institutions are a product of local history and circumstances, and they chart the routes for feasible reforms in water allocation. Rather than discarding them, application of water reforms that build on and enhance the social capital of local institutions are likely to be more effective and have lower transaction costs (Guillet 1998). Country-level efforts to change how water is allocated are likely to be ineffective or counterproductive unless grounded in an understanding of the principles and practices that guide its allocation at local level (Maganga 2003). Conversely, local communities face increasing challenges in comprehending and dealing with competing water uses and users beyond the boundaries of local management institutions (Maganga 2003; Gachenga 2012). To mitigate the water access and allocation predicaments faced by indigenes within the Okavango Delta, the adoption of legal pluralism is imperative as it recognizes that multiple legal frameworks coexist. Legal pluralism is not a matter of simply applying a single, well defined and accepted set of formal rights derived from national institutions, but instead requires recognition of the customary institutions among stakeholders. Water rights can be broadly defined as claims to water resources that are recognized as legitimate (Merry 1988). At the local level and within the customary institutions, water rights often defined and applied in ways that differ significantly from those that may be recognized in statutory institutions already exist in one form or another.

3. Methodology

This paper analyses institutions responsible for water governance and management in the Okavango Delta. A critical review of relevant literature is used to examine water governance institutions in the study area. In order to provide an in-depth scrutiny and insights into water governance and management institutions in Botswana, a narrative approach is used by engaging in literature and document analysis. Document analysis is a systematic technique for studying or evaluating both electronic and printed documents (Bowen 2009). In this study, data was explored and examined using various themes related to institutions for water governance and management in the Okavango Delta (Gondo et al. 2018). Assigning meaning and providing a broader understanding of the customary and statutory water governance institutions are crucial tasks in the analysis of this paper. The electronic database search was done systematically through the use of focused keyword search. Reviewing or searching the literature in a systematic manner refers to the identification, evaluation, and interpretation of available research relevant to a particular research question, or topic of interest (Kitchenham 2004; Kitchenham et al. 2009).The selected keywords include: water governance, water management; institutions, customary rules; statutory water institutions; cultural water management practices; water resources governance, legal pluralism, amongst others. The retrieved literature included water Act (1968), Water Bill (2005), Water Policy (2012) documents for the Republic of Botswana, reports, books, journal articles, etc. Customary and statutory water governance institutions in Botswana were thus investigated through the selection of appropriate subjects in which the two water governance institutions can assist the adoption of legal pluralism in the governance of water in the Okavango Delta and Botswana in general. The analytical framework of the study is rooted in the legal pluralism conceptual framework, which is employed to highlight in the need to adopt and appreciate customary and statutory water governance institutions in the governance and management of water in the Okavango Delta in Botswana. This was achieved by the use of and/or employing the backward snowballing approach of literature identification through which relevant peer-reviewed articles in leading journals were identified and analyzed.

4. The Okavango Delta

The Okavango Delta (Figure 1) is a large flood-pulsed alluvial wetland (Mendelsohn et al. 2010), characterized by very low level of anthropogenic transformation in the semi-arid north-western Botswana (Gondwe and Masamba 2014). It is located within 18°–20° East of the Greenwich Meridian and 22°–24° South of the Equator (Gondwe and Masamba 2014). It covers an area of 22,000 km^2 and is one of the world's largest inland deltas (Mendelsohn et al. 2010). The delta receives water from central Angola via Cuito and Cubango rivers and consists

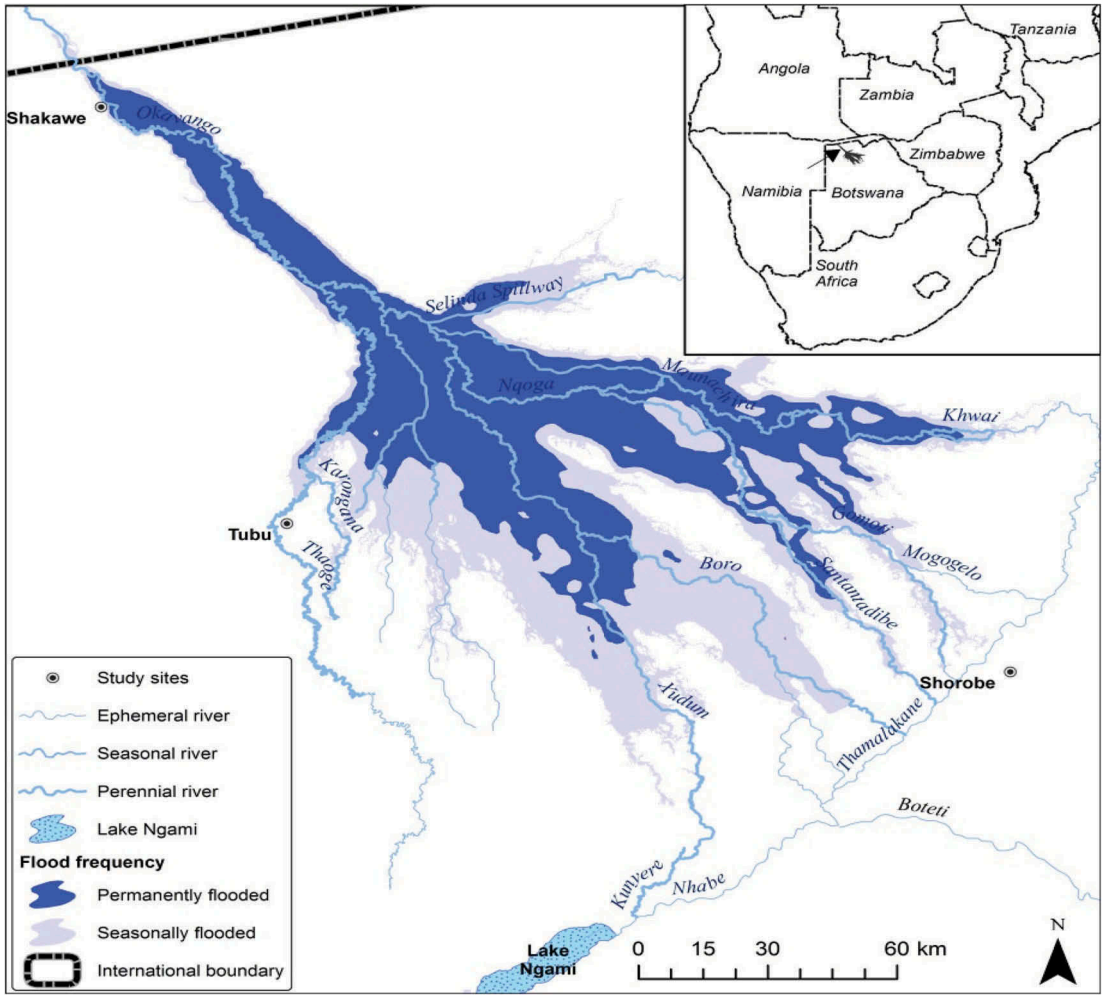

Figure 1. Map of the Okavango Delta showing the sampled sites.
Source: Okavango Research Institute GIS Laboratory

of five ethnic groups, each with its own ethnic identity and language (Mbaiwa and Stronza 2010). They are HamBukushu, BaTawana, BaYeyi, BaKalanga, and BaKgalagadi. HamBukushu, BaTawana, and BaYeyi traditionally engage in mixed economies of subsistence agriculture, hunting and collection of wild fruits (Bock and Johnson 2004). BaKalanga and BaKgalagadi engage in fishing, hunting and the collection of wild fruits. BaKgalagadi people utilize both forest and mineral resources.

5. Division into water governance and management

The distinction between governance and management is highly blurred and disputed subject in various scientific fields (Mutekwa and Gambiza 2016) owing to their numerous definitions and water governance and management is not an exception. However, the meaning of governance apparently depends on a particular research field, context of application, level of analysis of decision making and the views and roles of governance actors. In the context of water, governance can be understood as a set of procedures, institutions (both customary and statutory) and actors that determine how decisions are made and implemented in water distribution and use (Secco et al. 2011). It is essentially about who has the influence, who decides and how the decision makers are held accountable for water availability, access, quality and shortages (Graham et al. 2003). In this version, water governance is concerned of investigating the role and impact of water acts, policies and management strategies in the context of water access, delivery and use within the communities. It is an all-encompassing concept in which decision-making and implementation processes correspond to actors and their networks which facilitate the formulation and implementation of water legislations (Pahl-Wostl 2009). Water management on the other hand is concerned of activities of analyzing, monitoring, developing and implementing of measures to keep the

state of water within desirable bounds (Pahl-Wostl 2009). While water governance focus on the roles of both customary and statutory institutions at either local or national level in the regulation, policy making and implementation, management is concerned about the activities of planning, developing, distributing and managing the optimum use of water resources at the same categories and levels. Ideally, water resource management planning refers to all the competing demands for water and seeks to allocate water on an equitable basis to satisfy all uses and demands within the society. Governance of water as a new form of decision-making refers to the use of customary and statutory institutions in decision making and implementation. Traditionally water management has been perceived as a primarily technical issue, belonging to the field of engineers and hydrologists (Pahl-Wostl 2009). However, it is increasingly acknowledged that an adequate management of water requires that a broader stakeholder base and juridical context be taken into accounts. In both academia and policy circles, the attention has been shifted from an entirely water management toward water management with governance, thus requiring the combined and coordinated effort of both technical (engineers, hydrologists) and nontechnical experts (lawyers, economists, politicians) in the field of water. It this sense, the definition of water governance, which seems appropriate to embrace all stakeholders in water is that by Rogers and Hall (2003) which regards governance of water as "the political, social, economic and administrative systems that are in place to develop and manage water resources and the delivery of water services at different level of society".

6. Water institutional structure and reforms in Botswana

North (1990) conceptualizes institutions as *rules of the game* that direct the governance of common pool resources to avoid tragedy of the commons. Institutions in water governance are designed to influence human behavior by either restraining or enabling human choice (Mogomotsi et al. 2018). Institutions in this context can be viewed as established and prevalent social rules that structure social interactions as well as organizations, which govern water use. They constitute humanly devised constraints that structure political, economic and social interactions (North 1990). Based on North's (1990) definition, an institution is a framework of laws and organizations within which an individual acts. Thus, institutions in this case refer to any structure or mechanism governing the behavior of a set of individuals within the Okavango Delta in terms of water use, management and conservation. Thus, the Ministry of Land Management, Water and Sanitation Services (MLMWSS), Department of Water Affairs (DWA) and Water Utilities Corporation (WUC) are governmental organizations, which either govern or manage water issues in Botswana. In general, water legislations, policy and water organizations constitute what are called statutory water governance institutions in the Okavango Delta (see Figure 2). The reliance on groundwater and the limited spatial distribution of surface waters creates a complex institutional framework for water governance, management and development in Botswana (Republic of Botswana 2012). This is further compounded by the reliance on internationally shared and transboundary waters. In order to safeguard national interests and sovereignty, the government of Botswana has emphasized the need to constantly compile and analyze a comprehensive institutional framework for water governance in Botswana and the Okavango Delta in particular. This creates an opportunity for considering a legal pluralism approach in water governance in the Okavango Delta and Botswana in general through embracing both customary and statutory water governance institutions. As the definition of institution encompasses both legislations and organizations in water governance and management, expatiating on these institutions will begin by looking at them (the institutions) in the form of organizations and followed by highlighting institutions as legislations and policies (Figure 2).

As shown in Figure 2, the MLMWSS provides leadership and policy directive (Republic of Botswana 2012) to the DWA (a government entity) and WUC, a parastatal. The key role of the ministry is to formulate, direct and coordinate national water law and policy. It is also within its mandate to formulate water management strategies. However, the ministry delegates this responsibility to the DWA. The department develops water policy, monitors and allocates water to users. Furthermore, DWA provides technical expertise to the ministry on legislations and liaise with riparian water users at both national and transboundary level. Following DWA is the WUC, established under the Water Utilities Corporation Act of 1970 (Republic of Botswana 2005). Initially WUC was responsible for the supply and distribution of water within the Shashe Development Area. However, its mandate was eventually extended, making it to assume responsibility as the water authority for cities and villages within the entire Botswana. WUC, which is governed by WUC Act (1970), specifies financial principles and methods of charging water to ensure that the organization runs on the basis of commercial principles and ensure the recouping of cost (Republic of Botswana 2013).

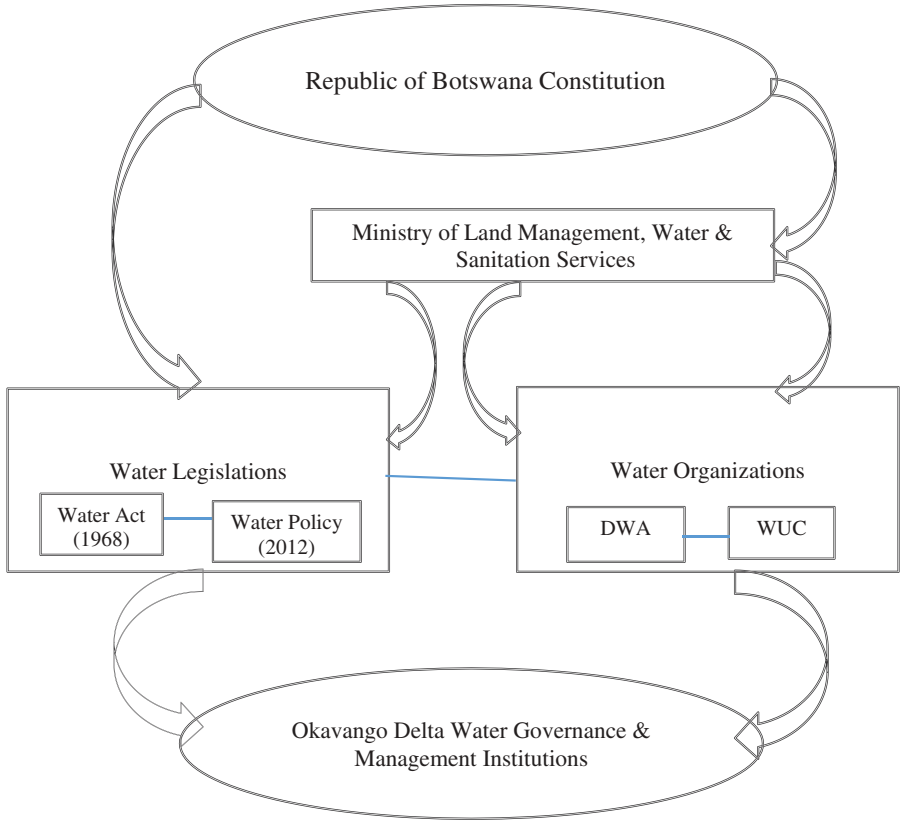

Figure 2. Water governance legislations and organizations in the Okavango Delta.
Source: Developed by the authors

As water institutions are defined as rules of the game in water governance, Botswana's water institutions comprise Water Act (1968), Water Bill (2005) and Water Policy (2012). These three are all entrenched in the constitution of Botswana. The 2012 Water Policy aims to provide a framework that fosters consumers' access to water of high quality and advocates for the development of sustainable water resources in Botswana. The policy is premised on the core principles of sustainable development, which takes into consideration the objectives of IWRM. While technically the Water policy (2012) adopts a decentralized catchment area approach and uses the precautionary principle, the transboundary nature of the rivers in Botswana makes the approach difficult to apply. The overarching guiding principles as enshrined in the Water policy (2012) are the *3Es* namely *equity, efficiency* and *environmental sustainability*.

Noteworthy is the fact that water resources management in Botswana has, for five decades after independence, been governed by the 1968 Water Act (Chapter 34.01). While there is a political will in reforming the legislations as shown by the 2005 Water Bill, it is important to note that the reform process is taking too long as the 2005 water Bill is yet to be promulgated 13 years prior to the changes. The first step toward reviewing this legislation was the setting up of the interministerial committee by the government to review water resources legislation. The committee was headed by the Ministry of Mineral, Energy and Water Resources (MMEWR) and it recommended the need for a new water act (Republic of Botswana 2013). This brought to the fore the 2005 Water Bill and the 2012 Water Policy. The proposed water Act (Water Bill 2005) is based on economic efficiency, environmental sustainability and equity of water use. The main features of the new water Bill (2005) and Water Policy (2012) are highlighted below.

The Water Bill (2005) proposes that water should not be privately owned as the case in the current act and water is to be completely viewed from the hydrology perspective. Both ground and surface water would need to be treated as part of one hydrological component. This is a departure from the prevailing Water Act (1968), which views the two water components as separate. Stakeholder driven institutions that have more say on water allocation and general water management on a day-to-day basis are supposed to be formed. A very important institution in this case is the Village Water Development Committee (VWDC). This is a crucial institutions within the context of the Okavango Delta. The formation of VWDC implies

the use of local rules (taboos) in water governance in rural Okavango Delta. The other key feature of the bill is that there is also the need to consider the environment as a legitimate water user. There is more control over pollution with the polluter pays principle taking a center stage. The bill proposes the abolition of common law riparian rights, which attaches water rights to the land owner. Based on the 2005 Water Bill, "No owner or occupier of any land, by reason thereof, have any right that is enforceable against the government or any other person… other than a right conferred by or acquired in terms of this Act". This buttresses the point that the government owns all surface and underground water. Thus, any use of water other than those meant for domestic purposes would need government approval. This implies that water management is not tied to land, hence, the transfer of responsibility from the MMEWR to MLMWSS. Although water is perceived as an economic commodity in which those who use it have to pay, it also recognizes the fact that water is a social good. In this regard, the bill makes exemption for the first 30–50 L water consumed per month by residents, making the monthly consumption within this threshold to be free (Republic of Botswana 2005). Although the water sector reforms are taking too long to consummate, the reforms are ostensibly likely to bring equity in water governance. The aim of the Water Bill (2005) is to involve all stakeholders in water governance and management. This seems a laudable idea as it proposes to incorporate all grassroots stakeholders. Figure 3 shows the organogram of the new water management institutions in Botswana. One key feature of the new water governance institutions is the introduction of Village Development Committee (VDC) and the creation of water management areas. It is, however, an uphill task to divide Botswana into catchment areas because most of its water resources are transboundary in nature (e.g. Chobe in the Northern Botswana). Thus, the creation of catchment areas necessitates the loss of her sovereign rights especially to Transboundary Rivers.

7. Customary institutions and water governance

African people have their cultural practices that serve to regulate their lives and issues on water conservation. To achieve this management system, there is a social hierarchy that controls communities even though African governments appear to not recognize such structures (see Figure 4). As depicted in the organogram, the Supreme Being ranks the highest in water issues. Spirit mediums and rainmakers are at the second tier of the ladder. The chiefs and elders occupy the third level. It is through this societal hierarchy that water issues are governed in honor of the ancestors (Dodo 2013). Among African people, the spirit medium institutions have seriously suffered a setback from statutory institutions whose principles define the African spirit world as satanic (Dodo 2013; Ngcobo and Obono 2013). Consequently, by

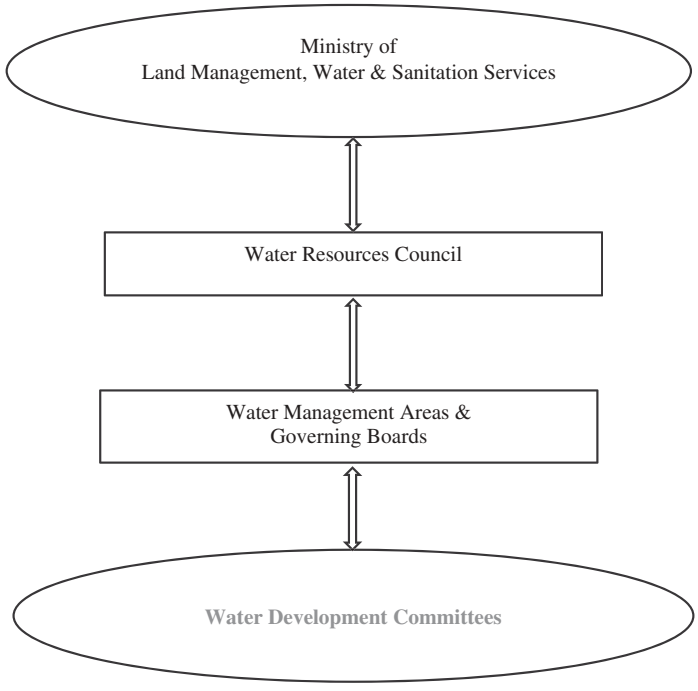

Figure 3. The proposed statutory water governance institutions in Botswana.
Source: Developed by authors

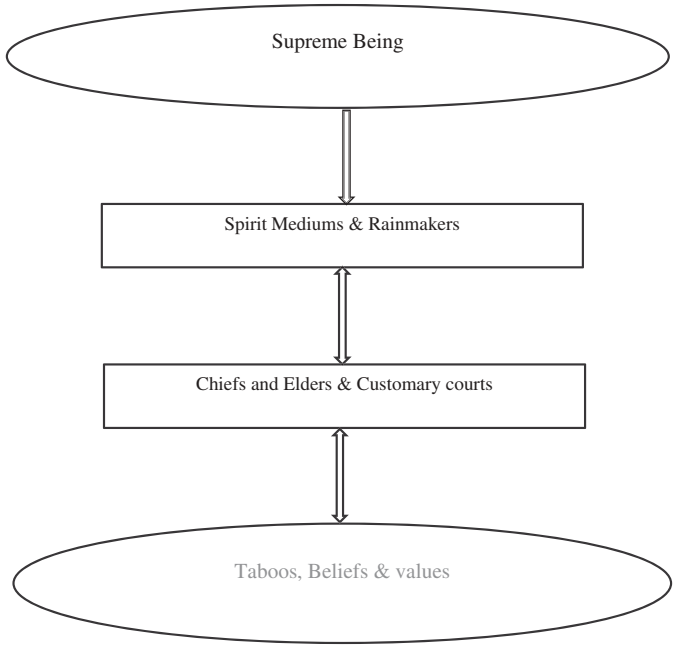

Figure 4. Customary water governance institutions in the Okavango Delta.
Source: Developed by the authors

virtue of their membership and allegiance to statutory institutions, most of people are shunning the practice despite having served the indigenous people well for thousands of years (Dodo 2018).

Long before colonialism and globalization, various communities that currently constitute modern Botswana society had evolved various institutions, which governed the use of water. The emergence of the modern state and globalization has resulted in the supplementation of the customary uses of water principally for domestic use, watering animals, farming (e.g. molapo) and cultural rituals for other uses particularly in the tourism industry. Climatic and ecological changes coupled with population increase have sharply reduced this availability of this vital resource. Faced with the phenomenon of dwindling water resources in the Okavango Delta, the government has, through the instrumentality of legislative measures, intervened to regulate the water sector. As earlier indicated, this has given birth to the MLMWSS, DWA, WUC, Water Act (1968), Water Bill (2012), Water Policy (2012) and the 2013 Water Management strategies and Plans. As such, customary institutions were downplayed in line with changing socio-economic and political dictates of Botswana.

However, it must be pointed out that customary institutions have been used and indeed were effective in monitoring water quality even before the onset of statutory institutions. Traditionally water has been used for appeasement of ancestral spirits, curing diseases and casting out evil spirits in addition to domestic uses. Accordingly, no customary institutions were developed to address matters of tourism and irrigation. Within the Okavango Delta communities, customary institutions had evolved rules to ensure efficient use of water resources.

Violation of these rules was an offence punishable by fines payable to the local chief or spirit mediums (Mehari et al. 2006). Apart from imposition of fines, religious and customary taboos also served as potent elements for ensuring compliance with customary rules on water usage (Colding and Folke 2001). Pronouncement of chiefs and spirit mediums as part of customary beliefs were scrupulously adhered to (Colding and Folke 2001), and disobedience of such edicts had grave consequences including death for the offender (Akong'a 1988). As documented in some parts of Ghana, Nigeria and Zimbabwe, it is forbidden to draw water in certain water pools on certain days of the week (Akong'a 1988; Maganga 2002; Segadika 2006; Kuruk 2007; Muyambo and Maposa 2014). It is also forbidden to grow crops along river banks, which are considered the resting abode of river gods and their children (Akong'a 1988). The protection of rivers and other water points is the responsibility of the entire society. They owe it a duty to the ancestors and those yet unborn to maintain river integrity.

To avert ancestral spirit punishment over the entire society, every member of the community is enjoined to refrain from acts that endanger the environment and to prevent others as well from doing so (Gachenga 2012). As the custodians of the environment and occupants of the

ancestral land, the chiefs in consultation with the spirit mediums mete out appropriate sanctions to offenders wherever and whenever appropriate (Maganga 2002; Kuruk 2007). Hence, enforceable rules enacted through customary beliefs are evolved for water conservation. Any dispute arising out of the use of water is resolved by the chiefs and elders at a local court (*Kgotla)* in line with the prevailing rules or practices and edicts handed down by the forefathers (Segadika 2006). The tribunal judgments are adhered to owing to the fear of chiefs who have powers to ostracize a person from the community (Kuruk 2007).

Owing to modernization, the potency of customary institutions as a tool for enforcing norms on water usage has significantly diminished. Christian beliefs, for instance, have overtaken customary beliefs, which were once given by the spirit mediums, chiefs and the elders; hence, sanctions that were feared in the past paled significantly (Akong'a 1988). The emergence of the modern state has further swapped the powers of chiefs with state water officials and institutions that were enacted by the post-colonial legislatures, and which substituted traditional customary edicts propounded by chiefs and spirit mediums. Generally, customary institutions as a basis for the enforcement of norms and taboos on the usage of water has paled into insignificance and indeed is honored by its observance only in the rural communities (Akong'a 1988).

8. Water governance and how customary institutions conceive water in the Okavango Delta

Figure 5 is an organogram of the customary water governance institutions in Botswana. At the top is the chief who is "….an individual who has been designated as a Chief in accordance with customary rules by his ethnic group assembled in the *kgotla* (customary court) and has been recognized as a Chief by the Minister (Letsoalo 1987). There are various ranks of chiefs (*dikgosi*). The Chief who is the head of the district and based in the district capital is most senior. S/he is assisted by Deputy Chiefs. Below the Deputy Chief rank is the Senior Chief Representative, who assists the Deputy Chief in the District capital or is in charge of the tribal administration in a large village, assisted by the Chief Representatives, headmen of record, and headmen of arbitration (Republic of Botswana 2013). The government has control over the recognition, promotion and demotion of traditional leaders of all ranks even if the chiefs are selected from the royal families (Molosi-France and Dipholo 2017). The system does not reflect an indigenous style of governance, but rather a hybrid of indigenous and Western democratic system. The importance of the *kgotla* lies in the fact that it represents the point of interaction of the traditional political system and the organization of the central government and district councils (Segadika 2006). It acts as a means of offering traditional legitimacy to the introduction of new ideas, ways of doing things and regulations issued by the new elites at the central and district levels (Molosi-France and Dipholo 2017).

Viewed from an ATR perspective, water is a blessing from God that gives, sustains and purifies human life. The argument is that if poor people do not receive basic volume of water of 30–50 L a day free of charge, they have a tendency to get it straight from a nearby primary source. In Botswana, the low charges of water use in urban centers and the heavy subsidy on them are in

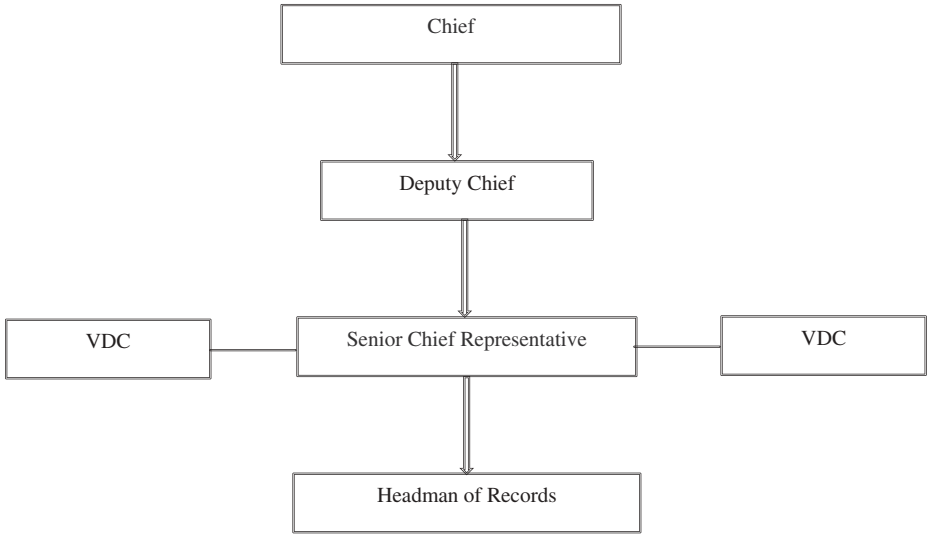

Figure 5. Customary water governance institutions in the Okavango Delta.
Source: Developed by the authors

favor of the rich who not only can afford high water price but also can afford to buy bottled water.

The key question then is *what does water as a social or economic good mean*? In an attempt to answer the question, the categorization of water sources are first made. Based on Akpabio's (2011) categorization, sources of water can be *private, restricted private* and *public* property. In water governance, water as a private property encompasses water in private containers (e.g. tanks), treatment plants (e.g. WUC water treatments plants), distribution systems and reservoirs (e.g. Gaborone Water Reservoirs, which is thereafter connoted as Gaborone Dam). This water source entails waterworks infrastructures, which are derived through investment in scientific knowledge. Investment in these infrastructures would mean that the owner of the investor has the right to use or sell it to recoup production costs and make economic gains. This then implies that the water in WUC treatment plants and distributary systems in the country is private water, which could be sold like any other economic goods.

Restricted private properties include dams located in private lands. For instance, Gaborone Dam is restricted private property. In this case, the owner of the land has special rights over others, but has certain obligations to them as well. Within these limits, the owner can trade water like any other goods but should still allow those who are incapacitated a free access to it. Public property water sources are water in rivers, Thamalakane, Okavango or Chobe, in this case. As water is in its natural state cannot be bought or sold, it can only become an economic good if and only if a business-oriented entity installs waterworks infrastructures to process and convey the water to people's homes.

Having classified water based on their sources, it is then possible to attempt to define the term water as a social or economic good. From an ATR perspective, to say water is a social good is tantamount to saying that water is a gift from God and necessary for sustaining life. The belief that water is a free gift from God is loaded with many meanings. The inherent belief in ATR and indeed in any other religions is that anything associated with God is presumed perfect. This notion tends to encourage usage of any water in the Okavango Delta regardless of the quality or source, Thamalakane River is no exception. Even when the quality of the source is physically very poor, people still use it for drinking and other domestic purposes. It is from this perspective that people living along Thamalakane and Okavango River and those surrounding the Okavango Delta make it a normal practice to drink water from whatever source available. Another ATR spiritual conception of water is on its quality. Water in a river like the Okavango River is freely utilized without question or complaints, no matter how dirty it could be. It is believed that any complaint about its physical conditions would automatically attract natural punishment from the gods of the river since water is also as an embodiment of animals (Akpabio 2011). Literature has shown that punishment on any erring individual could be in the form of sudden disappearance or any other form of physical disabilities (Muyambo and Maposa 2014). On the other hand, water as an economic good is understood from Savenije (2002) and McNeill (1998) who define water as an economic good as implying that decisions on the allocation and use of water should be based on a multisectoral, multi-interest, and multi-objective analysis in a broad social context, involving social, economic, environmental and ethic consideration. The key point raised in this is that water should be priced at its economic value (Savenije 2002). Once this is done, the market will then ensure that the water is allocated to its best uses. This concur with McNeill (1998) who postulates that water as an economic good entail the process of integrated decision making on the allocation of scarce resources, which does not necessarily involve financial transactions at all.

9. Conclusions and recommendations

Water governance in Botswana is currently dominated by statutory institutions. While legal pluralism entails the adoption of two or more water governance institutions, the status quo in Botswana is skewed toward statutory institutions. Although water sector institutional reforms are currently being undertaken in Botswana, the pace of the reforms is slow. For instance, the current water law was enacted in 1968 and has been in use since then. In 2005, an attempt to enact a new water law with the intention to incorporate customary institutions is still in the draft form ever since then. With the aim of analyzing the factors that create disharmony between customary and statutory water management institutions, the paper outlined the key tenets of legal pluralism as a conceptual framework underpinning this paper and distinguished water management from water governance by pointing to the fact that one deals with decision making (governance) while the other (management) deals with implementation of measures to ensure an easy access to water. By defining institution as both organizations and rules controlling the use of water, the paper outlines the main roles of both statutory and customary institutions in the governance of water resources in the Okavango Delta in Botswana. Having said that the paper recommends that a survey be conducted in the Okavango Delta to solicit local people's perception for governance of water using both customary and statutory institutions. This should be

done considering the point that customary and statutory institutions perceive water differently. It is against this backdrop that the paper recommends the adoptions of legal pluralism under which water institutions need to embrace both customary and statutory institutions in the Okavango Delta in Botswana.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Chapter 6

Institutional factors engendering dissonance between customary and statutory institutions in water access in the Okavango Delta, Botswana

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ORIGINAL ARTICLE

Institutional factors engendering dissonance between customary and statutory institutions in water access in the Okavango Delta, Botswana

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Abstract
The pervasive entrenchment of Western traditions in Africa continues to fuel the contradiction existing between customary and statutory water institutions on the continent. The paper addresses factors promoting the discord between customary and statutory institutions in water access in the Shakawe, Tubu and Shorobe in the Okavango Delta. Adopting an expert and homogeneous purposive sampling procedure, a total of 455 household heads, 44 community elders and 17 government officials were sampled in three rural villages in the Okavango Delta. Data were collected using key informant interviews, focused group discussions (FGDs) as well as household interview schedules. While quantitative data were analysed using descriptive (frequency, percentages) and inferential statistics (Kruskal–Wallis test, Mann–Whitney *U* test), content analysis was used to analyse the qualitative data. Findings revealed that there was a conflict between customary and statutory water management institutions in relation to how people in the study area accessed water.

Keywords Access · Household · Dissonance · Okavango Delta · Institutions

Introduction

Notwithstanding all the efforts meant to improve access to water across the globe (see Meeks 2018), inaccessibility to water resources continues to plague several of the world's poorest rural populations (Nastiti et al. 2017; Ablo & Yekple 2018). The United Nations World Water Assessment Programme (UNWWAP) (2015) affirms that 748 million people lack access to safe drinking water. Statistics also show that 1.6 million people die every year from waterborne diseases in developing countries (WWAP 2015; Meeks 2018). The United Nations (UN) (2015) regards access to water as essential for full enjoyment of life. Water access indicators include distance, time and quantity among others. Whereas distance entails the area travelled in kilometres to access water, time (in hours) implies walking duration from the water user's home to a water source. However, the anticipated optimal distance covered and time required to access water vary across nations and water-related institutions. For instance, while the World Health Organisation (WHO) (2008) advocates that water sources should be within 1000 m from the user's home and collection time not exceeding 30 min, the African Development Bank (ADB) sets 500 m as maximum distance to a water point and 30 min as the go, wait, collect and return time (Salami et al. 2014; Mwamaso 2015).

The global target 6.1 of the sustainable development goals (SDGs) states that each country must achieve universal and equitable access to safe and affordable drinking water by 2030. WHO (2018) and UNICEF (2012) stipulate that water is safe only when it is drawn from improved water sources.[1] This may not necessarily be the case because water might become contaminated before it reaches the tap. While the UN (2015) define water access on the basis of distance, volume and source, it must also be emphasised that water access

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[1] Improved water sources are those which, by nature of their construction adequately protect the water from outside contamination (e.g. borehole, tap water, protected well).

is a multidimensional concept, which comprises acceptance, availability, reliability and affordability. Cultural factors and statutory institutions are among the criteria used to define water access by citizens. While physical access denotes the easiness with which all households are able to access safe and adequate water facilities within their immediate vicinity in terms of distance and time (Kaushik 2011), economic access relates to the easiness with which monthly water bills are made affordable to all households (including the poor) in a way that does not limit their ability to afford other essential basic services such as food (Frone and Frone 2013). Water is deemed economically accessible when a household's proportion of monthly income spent on water does not exceed 5% (Allen et al. 2006; WaterAid 2011). However, legislative water access entails compliance with customary and statutory institutions in an endeavour to rightfully access water within a given community. In the context of this paper, institutions refer to humanly devised constraints that structure political, economic and social interactions in water use and management (Hodgson 2006; North 1990). In this article, institutions are categorised as customary (comprising unwritten, and nationally unrecognised and unofficial, humanly devised mechanisms regulating water use such as taboos, norms and spirit mediums) and statutory (nationally recognised and written humanly devised constraints like water legislations, policy as well as organisations).

The failing of the definition of water access is its lack of recognition of the actual quality of water delivered by the so-called improved source and how much each household has to pay for the item. The definition assumes that an improved source of water is free from contamination, but no universal monitoring of water quality occurs to verify this assumption (Smiley 2017). While the definition exclusively focuses on faecal contamination, the physical and social aspects are completely overlooked (Khan 2011). It is probably erroneous to assume that all improved water sources provide safe and clean water, as it has been proved otherwise by Gundry et al. (2006) who found *Escherichia coli* bacteria in 12% of improved water sources tested in South Africa and Zimbabwe. In Botswana, studies revealed that there have been instances in which water laden with gelatinous precipitates is supplied for households' consumption (see Moffat et al. 2011; Mashiqa 2018).

Based on Hutton's (2012) perspective, water affordability is expressed in the affordability index, which compares the household's monthly expenditure on water to the monthly disposable income of the same household. This implies that the price paid for water services must not limit people's capacity to buy other basic goods and services. In other words, households must not be forced to make compromises between the need for water and other basic needs such as food or medical costs (Langford and Winkler 2014). However, affordability index differs from region to region. While the affordability index of developed countries is about 3–4% of disposable income of lowly paid households, the index ranges from 2 to 8% across the economic divide in Africa. This index also differs depending on the institution setting the criteria. While the UNDP pegs the index at 3% (Hutton 2012), the World Bank (WB) and ADB both use 5% of the expenditure as the affordability index (Fogden and Wood 2009; Mwamaso 2015). While about one-third of the global population has private water connection (Gadgil 1998), a large proportion hardly receives water for more than 16 h each day, especially in developing countries (Satterthwaite 2003; Rathgeber 2003). It is uncommon for households to not experience incessant dry taps in developing countries. Consequently, unreliable water sources compel people to turn to unimproved water sources.

There are several sources of water in the study area and these include standpipes, indoor private pipes, borehole, tanks, wells and rivers (Ngwenya 2011). Prior to 2013, all households in gazetted villages within the study area obtained water for domestic purposes from standpipes supplied from boreholes by the district councils (DCs) (Bolaane 2000; Mazvimavi and Mmopelwa 2006; Ngwenya 2011). In 2008, the government of Botswana initiated the process of reforming the water sector with the aim of establishing more efficient and sustainable water management (Colman 2013; Setlhogile and Harvey 2015; Molokwane 2018). The reforms delineated water provision activities between DWA (instituted for water resources planning) and WUC (instituted for water resources reticulation) to reduce inefficiencies and fill the existing management gaps in the water sector (Briceño-Garmendia and Pushak 2011; Colman 2013; Setlhogile and Harvey 2015). Thus, water sector reforms led the DWA and DCs to cede water supply responsibility to the WUC. It is important to note that the WUC, which is a government parastatal, operates on a commercial basis (Briceño-Garmendia and Pushak 2011). Thus, the WUC Act (1970) mandates the WUC to recover the costs of service in water supply through revenues raised from the sale of water. This is in line with the government policy, which stipulates that the water sector should be self-financing (Bolaane 2000; Briceño-Garmendia and Pushak 2011). Given that the WUC took over water supply responsibility from the DWA, all potable water tariffs in Botswana are then based on Arntzen's (2007) and Khumalo's (2007) notion that water, which is very expensive to obtain and distribute, should not be subject to subsidies. Bearing in mind the policy shift from free access to potable water to that which compels every household to pay for potable water, this paper discusses factors engendering dissonance between customary and statutory institutions in water access in the governance and management of water resources in selected communities in the Okavango Delta, Botswana.

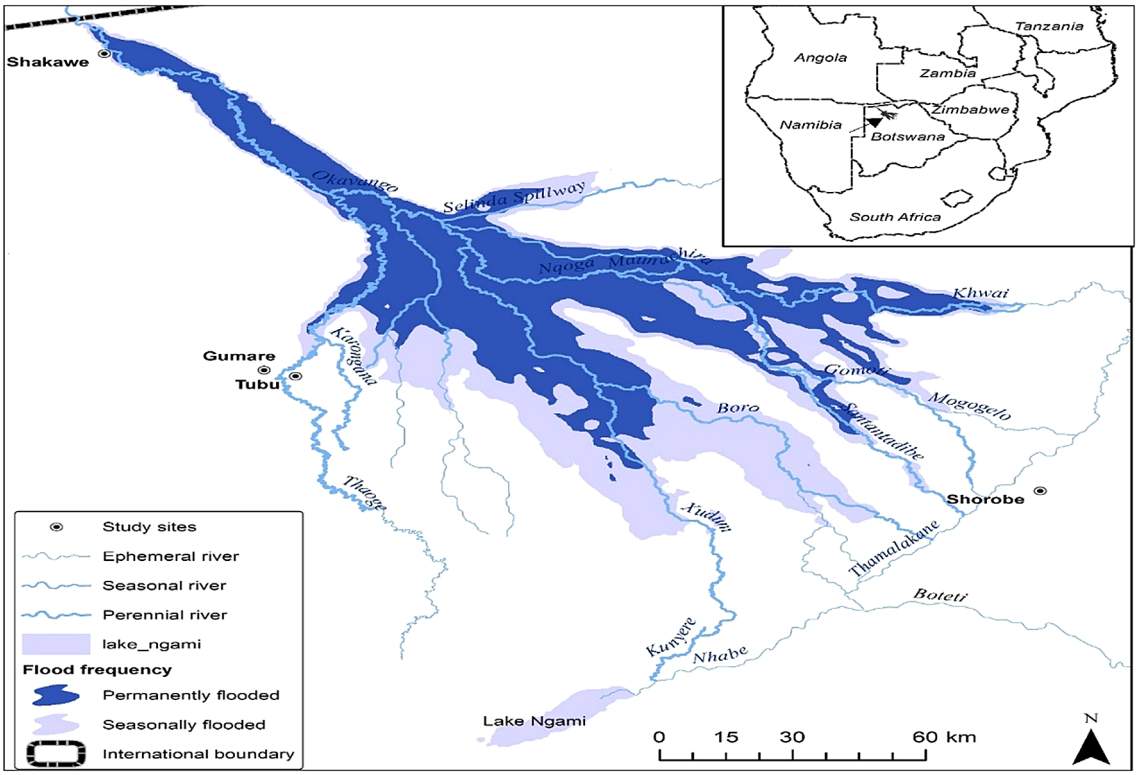

Fig. 1 Map of Okavango Delta showing study sites. Source: Okavango Research Institute GIS Lab. 2019

Methodology

Study area

The Okavango Delta is one of the world's inland deltas with a wide array of flora and fauna. In 2014, the Okavango Delta became the 1000th United Nations Educational, Scientific and Cultural Organization (UNESCO) world heritage site (Darkoh and Mbaiwa 2014). The delta swells in size between 6000 and 15000 km^2 as it floods between March and August (King and Chonguiça 2016). In terms of human population, the delta is inhabited by approximately four major ethnic groups (BaSarwa, BaYeyi, BaHerero and HamBukushu). The people use the area for fishing, growing crops and hunting.

Data collection

Primary data were collected through household surveys, focused group discussions (FGDs) and key informant interviews in purposively sampled rural communities of Shakawe, Shorobe and Tubu in the Okavango Delta (see Fig. 1), where customary institutions are valued and practised. Secondary data were gathered from water legislations, journal articles and policy briefs. The predominantly rural nature of the villages, presence of different ethnic groups and remoteness of the area provided the right platform for studying the cultural and socioeconomic issues, which hinder access to water. More importantly, the reliance on water-related forms of livelihoods within the study area played a part in the choice of the study area.

Sample size

A total of 455 household heads (HHs) were sampled through a multi-stage sampling procedure and interviewed by five field enumerators. One FGD session was carried out in each of the three villages and Gumare where the DWAs officials are based in the Okavango sub-district region. Forty-four (44) key informants who were village elders and 17 government officers participated in the study. The village elders provided knowledge on customary institutions and 16 DWAs officials provided knowledge on statutory institutions.

Data analysis

Statistical Package for Social Sciences (SPSS) version 25 was used to generate both descriptive and inferential statistics. While descriptive statistics were used to summarise the data, inferential statistics were used to make deductions. Also,

qualitative information were generated using thematic analysis to further strengthen the results.

Results and discussions

Social access to water

Water governance in the Okavango Delta is regulated by the Water Act (1968) and the Water Policy (2012). This act is the major legislation on water governance in Botswana. It affirms all water in the country as property of the government and upholds the right of everyone to use it. While the Water Act (1968) is silent on water as a scarce resource, the Water Policy (2012) and Bill (2005) recognise water in that regard. It then follows that the Water Act (1968) has control and regulatory mechanisms on how to administer water rights and meet its objective of making water available to everyone. Judging from the perspectives of the paper, however, these established regulatory and control mechanisms are a hindrance to easy access to water in the study area. The way the Water Act (1968) constrains access to water is exemplified by literature as well as the data obtained from a survey conducted from June to November 2018 in the delta. A water right is an authorised action to use and obtain benefits from water (Johnson et al. 1981). It includes the right to determine who has access to and authority to regulate water use (Schlager and Ostrom 1992). A key informant interview said that "[b]ased on the Water Act (1968), people cannot privately own water sources but can obtain the rights to use water by acquiring a water permit, which gives them a legal license to use but not own water". A review of the Water Act (1968) shows that when applying for a water right or permit, the applicant should state the use of water, the amount required and period of use among other needs. The Water Act (1968) also classifies water use in terms of priority. While domestic use is given the highest priority, livestock use, irrigation, industry, power generation and mining followed in that order. Once a water right is acquired, an individual is expected to pay water taxes, which are water user fees based on how much abstraction is allowed. An individual pays a total sum of P3 400 per annum after acquiring a water right (Personal communication with the key informant, September 2018). The fact that most (85%) of the HHs earn less than BWP1500.00 per annum would make it impossible for them to pay BWP3400.00 per annum to acquire water right. This implies that most of the people in the study area cannot individually own a borehole. With the exception of communal boreholes (which are associated with long queues of people trying to fetch water), the statutory institutions make it difficult for rural people to access water in the study area (Personal communication with key informant 2018).

The Water Act (1968) tends to obviate the role of customary institutions on issues of water. The Act does not categorically stipulate the role of customary institutions in water governance. A key informant said that statutory institutions are unknown to the villagers, and the enforcement in the rural areas was ineffective because local rules were not captured in the statutory institutions. According to the traditional leaders in the study area, lack of participation of local communities in the formulation of the statutory institutions in water governance made it to be alien to them. Based on the information obtained during key informant interviews, an individual is required to obtain land rights from the Land Boards in Maun to drill a well on a piece of land. An individual holds all the rights to both well and the water after drilling the well or borehole. The process of obtaining these rights was, however, described as laborious. Most (85%) of the HHs in the three villages showed that they had a strong allegiance to customary institutions in accessing water. The findings of this study agree with those of Nkonya (2006) who found that the de facto institutions regulating access and use water resources are customary institutions in rural Tanzania.

There is a large and growing body of literature on gender and socioeconomic factors, which impact water access (see Barnes 2013; Buechler and Hanson 2015; Harris et al. 2017). While there are diverse case studies in literature (Crow and Sultana 2002; Harris 208; Caruso et al. 2015), the major issue, which emanates from them, suggests that women are primarily responsible for the provision of water for domestic use at the household level, but are denied major decision-making roles for water supply and governance at both local and national levels. Accordingly, variables such as gender, age and level of education play crucial roles in water access discourses. Most respondents were females (63%) and most (69.9%) of them were below the age of 50 years (Table 1).

The average age of the respondents was 42.5 years with a standard deviation of 16.2 (Table 1). The educational achievement of an individual determines how the individual has access to improved water. Lack of or inadequate level of educational achievement serves as a barrier to empowerment (Bosch et al. 2001). Accordingly, the lower the educational achievement of individuals, the more they have limited opportunities to demand better facilities from the authorities; they are less empowered to demand better services from the providers (Bosch et al. 2001; Mahama et al. 2014). Given the cultural issues in Africa, inadequate water facilities affect the educational achievement of rural children, particularly girls as they bear the burden of water collection (Mahama et al. 2014). Findings show that most (76.3%) respondents had acquired formal education (Table 1).

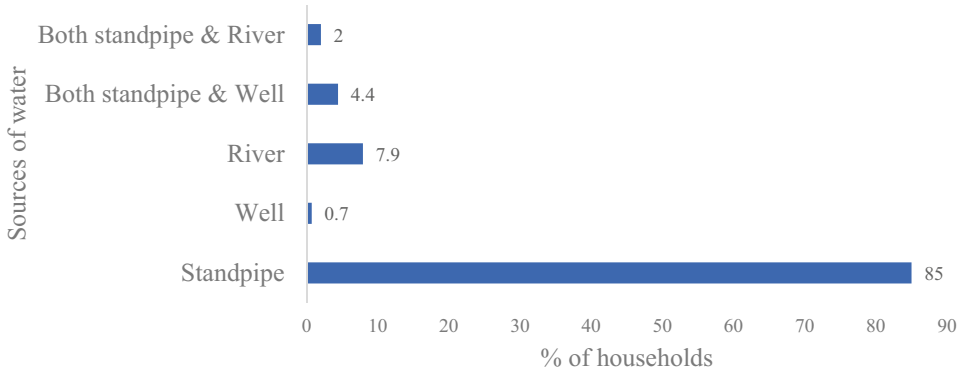

Fig. 2 Sources of water in the study area: source, fieldwork June–October 2018

Table 1 Distribution of HHs by demographic attributes

Variable	Freq	%	$N=455$	Mann–Whitney U	Correlation
Gender					
Male	168		37		
Female	287		63		
Age					
20–29 years	121	26.6			
30–39 years	112	24.6			
40–49 years	85	18.7			
50–59 years	63	13.8	$M=42.5$		
60 + years	74	16.3	SD = 16.2		
Educational level					
Non-formal	108	23.7			
Formal	347	76.3			
Income					
Less than P1500	412	90.5			
BWP1500–BWP2000	19	4.2			
BWP2500–BWP3000	14	3.1			
BWP3500–BWP4000	2	0.4			
BWP4500–BWP5000	4	0.9	$M=603.96$	$z=0.18$	
BWP5500 +	4	0.9	SD = 695.05	$p=0.86$	
Household size					
1–5 members	209	46			
6–10 members	185	41	$M=6.6$		$r=0.85$
11 + members	61	13	SD = 3.9		$p=0.01$
Religion					
ATR	69	15.2			
Christianity	378	83			
Islam	3	0.7			
Others	5	1.1			

Source: Field survey, June–October 2018

Also, household income is one of the determinants of access to water (Cole et al. 2018). Based on Cole et al. (2018), households with lower income have limited opportunities to improve their water supply conditions, as they are hardly able to afford high connection fees, which allow them access to piped water. The average monthly income was P603.96 with a standard deviation of 695.05. A majority (90.5%) of the respondents earned less than the Botswana standard minimum wage of BWP1500[2] per month (Table 1). An independent t test was conducted to compare income of males and females. The results indicated that there was

[2] 1Botswna Pula (BWP) = US$0.093.

no significant difference ($t = 1.12$, $p = 0.27$) between the incomes earned by males and those of females. This implies that the effect that income had on women's and men's access to water in the study area may have been entirely the same. The average household size was 6.6 with a standard deviation of 3.9. While 46% of the households had between one and five members, 41% had six to ten members. Only 13% of the households had 11 members and above (Table 1). Pearson product–moment correlation showed that there was a strong and positive correlation between the amount of water consumed per day (measured in litres) in a household and the household size (which was measured by the number of people living under the same roof). In terms of religion, the majority (83%) of the respondents were Christians with 15.2% being followers of African Traditional Religion (ATR) (Table 1).

Water access issues

Sources and amount of water consumed

Most of the households (85%) obtained water for domestic purposes from standpipes provided by the WUC (Fig. 1). Although standpipes were installed in locations, which enable people to walk less than 500 m to collect water (Personal interview with key informant), households could not easily access water because they were expected to pay for it. Personal interview with a key informant in Shakawe revealed that the residents were now expected to pay for water obtained from communal standpipes (previously provided for free to all rural communities) just immediately after the DWA ceded responsibility of water supply to the WUC. This policy shift was justified on the ground that the WUC would need to recover service costs through the revenue generated from the sale of water. This is also in line with the WUC Act (1970), which authorises the WUC to price water based on full cost recovery. Government policy stipulates that the water sector should be self-financing (Bolaane 2000). After assuming the responsibility of supplying water in rural areas, the WUC's modus operandi was based on the notion that the provision and distribution of water is very expensive and should, therefore, not be subsidised (Arntzen 2007; Khumalo 2007). With water sources in proximity, households can use their time for productive activities. However, it is also very interesting to note that 7.9% of the respondents fetched water directly from the Okavango and Thamalakane rivers. While the most used water source was the tap (standpipe) (85%), 0.7% of the respondents' fetched water directly from unprotected sources. Some 4.4% of the respondents obtained water from both taps and wells, while only 2% obtained it from both taps and rivers. A key informant opined that women were customarily responsible for ferrying water for household use. The findings revealed that while there were some (28.1%) households which satisfied their domestic water needs from unimproved sources and were not willing to pay, most (71.9%) of them were willing to do so. Those who were unwilling to pay indicated that they were too poor to do so, while others felt that "[w]ater from the taps has a bad taste and at times could be black or brown in colour". A key informant buttressed this by saying "[t]he water forms some sediments when stored in containers and we suspect it is not healthy for human consumption". Regarding the reliability of water supply over time, the majority (57.2%) pointed out that tap water might be available for a period of 1–2 weeks and would then vanish for a month or more. A few (5.7%) of the respondents revealed that water could be available for a month, but the tap could run dry within the space of two or more months. While 36.9% of the respondents acknowledged that water could be available all year round, they, however, affirmed that the tap only ran at night and early in the morning. One key informant lamented thus (Fig. 2):

> There is no point having a standpipe within 500 m if it runs dry most of the time. And if the queues are too long, an individual is unable to collect water on a timely basis.

Table 2 shows water consumption per household in the study area. A household consumed 75.4 l of water with a standard deviation of 37.3 (see Table 2). While a small percentage (2.6%) used 20 l per household, the majority (97.4%) consumed at least 40 l of water per household per day. Table 2 indicates that 21.1% of the households in the study area consumed less than the recommended amounts of water per household per day. This low daily water consumption probably reflects the high water charges in the study area. The findings corroborate those of Wagah et al. (2010) in Kisumu District in Kenya, where 25% of the households consumed less than the recommended 100 l of water per household per day. Similarly, the studies by Fan et al. (2014) and Gallego-Ayala (2014) in Mozambique revealed a similar trend in which a small proportion of households consumed less than the recommended amount of water per day.

Table 2 Amount of water consumed per household

No. of 20-l buckets	Amount (l)	Percentage	Descriptive statistics
1	20	2.6	
2	40	18.5	
3	60	22.2	Mean = 75.4 l
4	80	56.7	Std. dev. = 37.3

Source: Fieldwork, June–October 2018

Table 3 Distance and time taken to reach a water source

Time and distance	% of HHs	Descriptive statistics	Pearson correlation
1. Over 2 h	0.9		
2. More than 1 h	3.5		
3. Less than 1 h	2.4		
4. Less than 30 min	93.2	Mean = 1.12 h	
Total	100	Std. dev. = 0.48	
5. Over 6 km	0.2		
6. 4–5 km	1.1		
7. 2–3 km	4.8	Mean = 1.08 km	$r = 0.57$
8. Less than 1 km	93.8	Std. dev. = 0.33	$p = 0.000$
Total	100		

Source: Fieldwork June–October 2018

Distance and time taken to fetch water from sources

The proximity of the home to a water source is a vital variable in measuring water access (Mwamaso 2015). While the government of Botswana has set 500 m as the maximum distance to a water point (Mmopelwa and Mazvimavi 2006), literature has shown that there is no consensus on a standard distance to measure access to water but any distance less than 1 km is ideal (Smets 2009; Hutton 2012). Nonetheless, access to water is extremely impaired when travel distance and the average waiting time exceed 1000 m and half an hour, respectively (Howard et al. 2003; Smets 2009;). The average distance travelled to a water point was 1.08 km with a standard deviation of 0.33. Results revealed that while most (93.8%) of the respondents travelled less than 1 km, 0.2% covered over 6 km to complete a journey to and from water sources (see Table 3).The average travel time to water point was 1.12 h with a standard deviation of 0.48. Most (93.2%) respondents took less than 30 min for an all-round trip to and from water points. The relationship between distances travelled to a water point (measured in kilometres) and time taken to go, wait, fetch and come back (measured in hours) was analysed using Pearson product–moment correlation. The result shows a strong positive correlation between distance travelled and time taken to complete one trip to and from water sources. It is, therefore, inferred that people who live far away from water sources would take more time to travel to and fro.

Analysis shows that most (93.8%) households got potable water within 1 km distance. It is noteworthy that while water was physically accessible to 93.8% of the studied population, only 0.6% of them lived within less than 1-km radius of water point, but took more than half an hour to return from water sources. According to a key informant, this delay was because "[w]ater has low pressure and in most cases, there are long and winding queues at the standpipes especially during morning and evening hours". Given that water was within 500 m for most (93.8%) respondents while approximately 1% of them preferred to fetch it from far away is probably an affirmation to Mwamaso's (2015) argument that water users are likely to give more attention on the intended purpose of water and acceptability of certain water sources rather than just proximity to sources. Thus, water for cultural rituals is purportedly not obtained from ordinary sources, but rather from certain sources which are perceived as sacred (see Mwamaso 2015).

Water affordability index as a measure of water access

Water affordability is a ratio of a household's monthly income spent on water against its total monthly income given as a percentage (Peprah et al. 2015). Affordability of water is represented in affordability ratio (AR). This measure can be calculated for an individual household or aggregated statistically for a defined group of households (Gawel et al. 2011). For instance, for a household c, the AR is given by the formula below:

$$\mathrm{ARc} = \frac{\mathrm{Pc(W + S)}}{\mathrm{Ic - Ec}},$$

where I is the household income, E is the essential household expenses other than water, P is the number of household members, and W and S are the per capita cost of essential water.

For instance, the AR for a three-member household with a monthly net salary of BWP1500, with other essential household expenses (other than water) amounting to BWP1300 and the cost of essential water per month is BWP60 is shown below:

$$\mathrm{ARc} = \frac{3(60)}{1500 - 1300} = 0.9.$$

Table 4 shows the WUC's potable water tariff structure, which came into effect on the 1st of April 2017. Based on

Table 4 Domestic potable water tariffs (2017-date)

Block tariff category (kl)	Exc. VAT Revised 1st April 2017	Incl.VAT Revised tariff 1st April 2017
Minimum charge	BWP0.00	BWP0.00
(i) 0–5	BWP3.50	BWP3.92
(ii) > 5–15	BWP10.40	BWP11.65
(iii) > 15–25	BWP18.20	BWP20.18
(iv) > 25–40	BWP28.00	BWP31.36
(v) > 40	BWP35.00	BWP39.20

Source: Water Utilities Cooperation Annual Report, 2017

Table 4, a consumer who uses 40 kilolitres of water per month pays BWP808.22 (see Table 5). A standard connection fee of up to 50 m connection distance in which the WUC digs trenches and provides connection materials would cost BWP2000.00. However, this amount is reduced to BWP1500.00 in the event that the customers dig the trenches and the WUC provides the materials and labour (WUC 2017).

Given that the majority (90.5%) of the households earn less than BWP1500.00 per month, paying BWP808.22 for water is beyond the affordability of the households in the study area.

While water affordability is dependent on the financial dispositions of individual households (Smiley 2017), a household's monthly water bill should not exceed 5% of its monthly income if water must be economically accessible to the household (WaterAid 2011). Analysis revealed that the average income of households was BWP603.96, with a standard deviation of 695.05. While 1.1% of the respondents earned BWP1500 per month and spent 1.3% of their income on water (see Fig. 3), some 1.1% also earned between BWP50 and BWP850 per month and spent between 2.4 and 40% of their income on water. However, most (91.9%) of them earned less than the minimum wage of BWP1500 per month and spent 40% of it on water bills. A relatively small percentage (8.1%) of the studied population, however, earned above BWP1500 per month and spent between 1.5 and 5% of their income on water bills. A Kruskal–Wallis test revealed a statistically significant difference ($\chi^2 = 5.2$, $p = 0.014$) in the mean ranks of water expenditure across income groups. The findings affirm Smiley's (2017) findings that households in lower-income groups spend less money in terms of absolute figures but more in terms of percentages, and households in higher-income groups spend more in absolute terms and less in terms of a percentage of income expended on water. Also, a post hoc test using Mann–Whitney U analysis revealed a significant difference ($U = 579$, $p = 0.003$) in expenditure on water between the lowest and highest income groups. Moreover, the effect size for the sample difference was 0.1.

Table 5 A water bill for a 45 kilolitres of water consumed per month

Potable water	Total (excluding VAT)	VAT @ 12%	Total (inclusive of VAT)
First 5 kls @ BWP3.50	BWP17.50	BWP0.00	BWP17.50
Next 10 kls @ BWP10.40	BWP104.00	BWP12.48	BWP116.48
Next 10 kls @ BWP 18.20	BWP182.00	BWP21.84	BWP203.84
Next 15 kls @ BWP28.00	BWP420.00	BWP50.40	BWP470.40
Total	BWP723.50	BWP84.72	BWP808.22

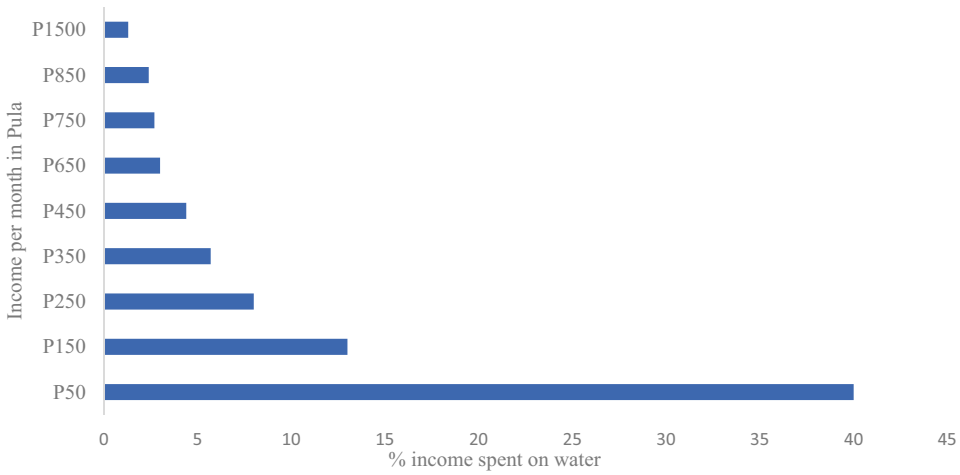

Fig. 3 Income and percentage spent on water bills (Source: Fieldwork June–October 2018)

Table 6 Distribution of HHs by their perceptions about the role of cultural taboos in accessing water

Statement	SA (%)	A (%)	N (%)	D (%)	SD (%)
(i) There are taboos for water abstraction from a source	35	24	8	17	16
(ii) Taboos are set and enforced by chiefs	12	7	10	39	32
(iii) There are sanctions for failure to comply with taboos for water use	29	26	16	14	15
(iv) I came to know about taboos for water use through folktales from elders	36	39	11	12	2
(v) There are spiritual beings which live in sacred water sources	37	39	16	3	5
(vi) Snakes, frogs and crocodiles are the commonest creatures associated with local water rules/taboos	44	36	10	4	6
(vii) If one kills a frog in a sacred water source, the source dries up	14	10	8	32	36
(viii) Local water taboos were meant to monitor and control water pollution	35	26	14	12	13
(ix) It is a taboo to use water meant for religious devotions for domestic purposes	62	23	6	2	7

Source: Field survey, June 2018-October 2018

SA strongly agree, *A* agree, *N* neutral, *D* disagree, *SD* strongly disagree

It is, therefore, concluded that people in the lower income bracket use a lot of their meagre earnings to access water as compared to their counterparts who earn big incomes per month. As the lower income group spend on average more than 5% of their income on water, it is concluded that improved water supply is economically inaccessible to most of the people in the study area. Given that the more water an individual uses, the more they pay for the item, some (15%) of the households resorted to fetching water from the Okavango and Thamalakane rivers. This scenario is most prominent in Tubu, because the community "…does not have any stand-alone water supply system but relies on water supply from Gumare village which is about 20 kms from Tubu" (Key informant interview, September 2018).

The ratio of water bill of a household to its disposable income describes the affordability index of the household (Smets 2009). The index is low and very high in affluent and poor households, respectively. While the index is between 1 and 2.5% for rich households, it can be as high as 50–90% in very poor households in which most or all household members are unemployed. Improving access to affordable water requires paying attention to the affordability index and taking measures to reduce it through differentiated pricing, targeted programmes and cross subsidy systems. If the index is high, water is said to be too expensive and hence it is unaffordable.

Households' perceptions about water access

The distribution of HHs by their perceptions about the acceptance of cultural taboos in water access in the study area is presented in Table 6. While cultural values and practices are not static, changes in them and belief systems are, however, not accompanied by the transformations in the material aspects of a given society (see Kolawole 2001, 2012). Literature has shown that people in different cultures conceptualise water in different ways (Nkonya 2006; Akpabio 2011, 2012). The findings revealed that there were myths and taboos in accessing water from rivers and wells, especially in Tubu and Shakawe. Based on Shoko and Naidu (2018), myths are tales which are believed to be true by a specific community and use a spiritual explanation to interpret and make sense of the natural world and behaviour of humankind. While a myth is a legend with a supernatural explanation, a taboo is a social or religious custom prohibiting a practice (Akpabio 2012). In attempting to determine how customary institutions restrict access to water, HHs' perceptions about the efficacy of taboos in water management were analysed. How HHs felt about the role of taboos in accessing water and how effective they thought these cultural taboos were in hindering access to water were examined.

While some of the statements were analysed to show whether there were myths and taboos surrounding water access in the area, others, from another perspective, were meant to analyse people's perceptions about the effectiveness of myths and taboos in water management. These statements were constructed based on literature (see, for instance, Nkonya 2006; Akpabio 2011; Amerson 2018; Amanda 2018; Shoko and Naidu 2018). They were rated on a 5-point Likert scale of 1–5 points. The minimum points possible for a household was 9 and the maximum was 45. In terms of the existence of taboos related to water abstraction from water sources, some 35% of the HHs affirmed that "[t]here are taboos relating to water abstraction from water source". However, interviews with the key informants indicated that local people had more inclination towards customary than statutory water management institutions because of their personal experience over the years. The assertion buttresses Akpabio's and Shoko and Naidu's viewpoint (see Akpabio 2011; Shoko and Naidu 2018), which confirms that in rural areas of developing countries, certain water sources are of

high spiritual and religious importance such that restricted entry is openly enforced by certain traditional codes of obeisance.

It is noteworthy that the perception of the existence of sacred water points is one peculiar aspect of water resources governance in the study area. A key informant opined that revered water points were believed to be linked to a deity and were of importance to rural communities. The study revealed that water is perceived as an abode of spirit beings and human souls, which animate in the form of frogs, crocodiles and mermaids. This belief in water spirits was more emphasised in Tubu and Shakawe and amongst the elderly than the young and in state institutions. Another key informant indicated that certain water points had restricted entry and openly enforced by certain traditional codes of access to maintain their sanctity. Such water sources accorded some measure of respect and ritual oblations. Consequently, entry is restricted in some days to enable the fulfilment of ritual formalities (personal communication with key informant). Also, one key informant said "[i]t is very dangerous to fetch water from the river in the evening and women on their monthly periods are not allowed to go to any river to fetch water". In the context of water access in the study area, thus, taboos and myths had an impact on accessing water in the study area. The results of this study agree with the findings of Huggins (2000: pp. 22–24) in Kenya and Akpabio (2011: pp. 584–596) in Nigeria, where they found that certain water sources were greatly valued and were deemed sacred. A critical analysis of the myths and taboos in the study area revealed that there is nothing spiritual for women undergoing menstruation to be prohibited from fetching water from any river or doing so at night. The taboos were only devised to deter people from polluting water and encourage promptness in carrying out some water-related activities. While these taboos used to be effective in the past, they are no longer obeyed by the majority of the people particularly the younger generations who have been exposed to Western civilisation. Thus, one key informant had this to say:

> The white people who came to our area brought their religion—Christianity—and they said what we are doing is part of witchcraft and these Christian believers are against those practices. That is why these taboos are no longer effective, especially these days.

Perceptions about water as a social or economic good

In this section, two opposing views on water management, namely "water as an economic" good and "water as a social good" were examined. Thus, the distribution of HHs by their worldviews on these two notions is shown in Table 7. Literature has shown that since the Dublin Conference on water and environment in 1992, there has emerged a dissonance in the way water is conceptualised and how it should be managed (see Akpabio 2011; Gondo et al. 2018a, b; McNeill 1998; Savenije 2002). On the one hand, there is the belief that water is an economic good, while on another, water is regarded as a God-given commodity. Those sympathetic towards statutory institutions argue that water should be priced at its economic value if it is to be managed sustainably and the adherents of customary institutions opine that water should be accessed free of charge regardless of whether it has been purified or otherwise, as it is a free gift from God. While the meaning of water as an economic good is somewhat elusive, Savenije and van der Zaag (2002) came up with a working definition. Firstly, where water is conceived as economic good, it should be priced at its economic value so that it is accorded its best uses. Secondly, where water is conceived as a social good, there must be an integrated decision-making on its allocation from different stakeholders, which does not necessarily involve financial transaction at all. Here, water being an economic good would imply that the decision on its allocation and use should be based on a multi-interests analysis in a broad societal context, involving cultural and economic considerations (see Savenije 2002; McNeil 1998; Rogers et al. 1999). However, the other school of thought argues that water must be accessed freely as people get it free from nature. Thus, they opine that there should be no price tag placed on water whether purified or in its natural state. In an attempt to understand how people in the study area conceive water and on how it should be accessed, two statements "[w]ater is God-given and therefore people must get it free of charge" and "[w]ater has an economic value and so people must pay to access it" were placed and rated on a 5-point Likert scale (see Table 3). While the majority (71.9%) of the HHs agreed with the assertion that "[w]ater is God-given and people must get it free of charge", the rest (25.5%) disagreed with the assertion. Regarding the statement that "[w]ater has an economic value so people have to pay to access it", most (68.7%) of the respondents disagreed with the assertion. While 28% of the households agreed with the assertion, only 3.3% of them were neutral.

Table 7 HHs' conception of water

Statement	SD	D	U	A	SA
(x) Water is God-given and people must get it free of charge	11.4	14.1	2.6	18.5	53.4
(xi) Water has an economic value, so people must pay to access it	35.8	32.9	3.3	11.7	16.3

Source: Field survey, June 2018-October 2018

SD strongly disagree, *D* disagree, *U* undecided, *A* agree, *SA* strong agree

Two key meanings were assigned to water, namely "gift from God" and "the embodiment of spirits". There was a consensus on water as a gift from God among all the respondents, irrespective of faith and religious affiliation. The belief that water is a gift from God is loaded with many meanings. It assumes the status of perfection because it is God given. The inherent belief is that anything associated with God is presumed perfect (see Akpabio 2012; Gondo et al. 2018a, b and Nkonya 2006). Regardless of water quality or source, this notion tends to encourage usage of any available water.

Conclusion

The paper analysed customary and statutory institutional factors engendering the dissonance existing between customary and statutory water management institutions in accessing water in the study area. The elusive nature of the concept of water access is engendered by a lack of consensus amongst institutions, which set the criteria for the measurement of water access. Findings showed that the majority (91.9%) of people in the study area earned less than the minimum wage in Botswana. The average household size was seven members. Although most of the households fetched water within the UN acceptable distance of 500 m or less, most households spent more than the required proportion of their income on water as against those prescribed by relevant international and financial bodies. Although water is relatively accessible in the study area, there is a lack of harmony between customary and statutory institutions addressing water issues. The paper has demonstrated that some households were more likely to opt for water from specific sources depending on intended use and affordability. Although statutory institutions stipulate that individuals need to apply for and be granted a water right (paid for in the form of water taxes), customary institutions perceive water from a social good perspective in which there is no payment required for water access and use either in its raw or purified state. This viewpoint refutes statutory institutions' water access policy. As water is available to everyone in the context of customary institutions, acquiring specific water rights either for an in situ or river draw-off waterworks is not required. Thus, customary institutions differ from statutory institutions, which are capitalist oriented in water issues. In the context of customary institutions, the study revealed that local people perceived water as a blessing from nature, which gives and sustains life, and which is an essential component of life that is supposed to be accessed free of charge. This is against statutory institutions' position, which 'justifiably' pushes for the commodification of water to conserve and realise its value as well as ensure its supply infrastructure sustainability. The paper, therefore, recommends that the government needs to substantially subsidise potable water to enable indigent individuals in both rural and urban areas to have access to the resource.

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Chapter 7

Stakeholders' perceptions on water resources management in the Okavango Delta, Botswana

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Stakeholders' perceptions on water resources management in the Okavango Delta, Botswana

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Cultural perceptions are an integral part of rural water resources governance, which ostensibly conflict with urban water resources management. Issues of access to water and culturally embedded gender roles are rife in water governance debates. Notwithstanding the importance of cultural perceptions in water management, no study has been undertaken to assess stakeholders' perceptions on customary and statutory water management institutions and their impact on water management issues in the Okavango Delta. Guided by the cultural lag concept, a purposive sampling technique was used to select three villages (Shakawe, Tubu and Shorobe) in the study area. While 455 household heads were randomly selected to elicit pertinent socio-economic and cultural data via a questionnaire survey, an expert purposive sampling technique was used to select nine key informants from whom in-depth information on the subject was obtained. The results indicated that local people's perceptions of cultural water management practices were mostly tied to their belief systems even though the existing management strategy is grossly sympathetic towards statutory water management institutions. The paper recommends the blending of customary and statutory water management institutions and placing both of them on the same pedestal in the management of water resources in the Okavango Delta and other, similar social-ecological milieus.

Keywords: **allocation; culture; ethnic; intangible; Okavango Delta; perceptions; Tswana; water management**

1 INTRODUCTION

Perceptions and cultural traditions, embodied in social institutions, are some of the intangible aspects of water resources management (Akpabio, 2011). They constitute important elements of water resources management in most developing countries and elsewhere. "Perceptions" in this context refers to subjective opinions on and beliefs about water resources, which derive mostly from the cultural traditions of various ethnic groups. Whereas customary institutions constitute nonstate, socially embedded beliefs based on culture and daily practice meant for water resources management (Gachenga, 2012), statutory institutions denote formalised arrangements based on explicit organisational structures, contracts and legal rights often introduced by governments (Akpabio, 2011). There is a clear distinction between statutory and customary institutions. While customary water management institutions are informal and unwritten human-devised constraints and behaviours that are accepted by the community and persist over time, statutory water management institutions are officially written and codified legislations (Cleaver, 2002). Contrary to customary water management institutions, which are enforced by the elders and spirit mediums, statutory water management institutions are prescribed by the central government. Whereas government authorities enforce statutory institutions by means of sanctions such as fines, imprisonment and, in some extreme cases, execution, enforcement of customary institutions takes place by expulsion from the community, ostracism by friends and neighbours or loss of customary reputation (Gondo, Kolawole, and Mbaiwa, 2018; Nkonya, 2006; Pejovich, 2012). According to Nkonya (2006) and Pejovich (2012), customary institutions are rules which were developed by the forefathers based on their societal understanding at a point in time. These are customs, moral values, religious beliefs and all other norms of behaviour that have passed the test of time. Customary water management institutions are often known as "[o]ld ethos, the hand of the past, or the carriers of history" (Pejovich, 2012: 130). Thus, they embody the community's prevailing perceptions about the world, accumulated wisdom of the past and current set of values. The literature has shown that customary water management institutions include a community's views about water resources management (Nkonya, 2006; Uphoff, 1986), the accumulated wisdom of the past in water resources management (Uphoff, 1986) and the current set of affairs. In this regard, Nkonya (2006) remarks that customary institutions are part of the community's culture. They are unwritten laws that are maintained from one generation to another through various transitional mechanisms, among them imitations, oral lore, sanctions, taboos, traditions, cultural norms, beliefs, values, social networks, kinship ties and codes of conduct and teaching. The enforcement of customary institutions contrasts unambiguously with the methods employed to enforce statutory institutions. The differences in

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enforcement strategies have to a great extent a bearing on the degree of compliance and perceptions within both sets of institutions.

While several studies have acknowledged the cultural significance of customary institutions and their influence in determining the general management of water resources (Akpabio, 2011; Craig and Gachenga, 2010; Gachenga, 2012; Gondo *et al*., 2018; Huggins, 2000; Kuruk, 2004; Latham and Chikozho, 2004; Maganga, 2003; Twikirize, 2005), little attention has been paid to water governance issues such as access, use or allocation within the Okavango Delta. Little is known in this study area about how customary meanings and values assigned to water affect the success of statutory water governance institutions. As noted by Akpabio (2011), the knowledge of customary practices is crucial in helping government and development agencies negotiate their water development projects and initiatives in rural communities. The main objective of this paper is to assess key stakeholders' perceptions about the management of water resources by means of both customary and statutory water governance institutions in the Okavango Delta, Botswana.

2 Conceptual framework underpinning perceptions on water resources management

The thrust of the paper is underpinned by Ogburn's (1886–1959) *cultural lag* concept, which helps to explain how rural and urban people predispose themselves to water management issues. In Ogburn's thesis, culture consists of both concrete and nonconcrete components. While the tangible (material) aspect of culture comprises objects such as fabrics, food, musical instruments, artefacts, communication technology gadgets, etc., the intangible (non-material) aspect comprises the language, norms, mores and values of the people. Ogburn demonstrated that the material aspects of culture change at a faster rate than its non-material aspects, which makes the latter lag behind the former (Volti, 2004). This implies that people might not readily change their perspectives on how they understand their world, unlike the change that occurs among them in relation to their responses to newly introduced, concrete innovations (see Kolawole, 2014; Lewin, 1952 [1947]). Invariably, the rate of change happens at a faster rate in the material than in the non-material aspect of culture, due to many discoveries and inventions (Godin, 2010). While the change in the material component of culture is visible and pervasive, the non-material aspect of culture is not easily noticeable and changes slowly if at all over time. Elsewhere, Kolawole (2001, 2012) posits that:

> Local people are naturally inclined to uphold age-long philosophies, mores, values and traditions, making them to exhibit more preference for their knowledge systems even in a technology-burgeoned environment [, and] … regardless of the degree to which they have embraced modernity, local people continue to prefer the knowledge which belongs to them in time and space.

It is this cultural delay (Godin, 2010) which influences indigenous people in the Okavango Delta to perceive customary water management institutions and practices as having a crucial role in the management of water resources in their locality.

3 Methodology

3.1 Study area and sample size

This study adopted a cross-sectional research design that allows for data gathering as a one-off event in order to provide a snapshot of the phenomenon under study (Greenwood and Levin, 2006). This design was adopted because its usage did not need a follow-up, making the process relatively inexpensive (Garn *et al*., 2018) as little time and few other resources were needed to carry out the investigations. This study was conducted in the three villages of Shakawe, Tubu and Shorobe in the Okavango Delta (see Figure 1). The socio-economic and cultural background of the residents in the study sites was the focus of investigation. The three study villages, comprising major ethnic groups (BaSarwa, BaYeyi, BaHerero and HamBukushu), were purposively selected. The rural nature of the villages provides a conducive platform for studying perceptions on cultural issues surrounding water management practices as opposed to the centralised statutory institutional structures. Nonetheless, data derived from the study area might not truly represent the vast socio-economic and cultural diversity of Botswana. However, this study is very significant as it opens up research opportunities in areas of distributive water governance, which are mostly overlooked by researchers probing social issues in the area. Using Taro Yamane's (1973) formula (see Table 1), a total of 461 household heads (55 from Shorobe, 315 from Shakawe and 91 in Tubu) were proportionately sampled from each village. However, a total of 455 instead of the listed 461 household heads were interviewed in the end because of the failure to get consent from some household heads, absence from the homestead by certain homestead owners during data collection periods, etc.

Table 1 shows the total number of household heads, the target sample size and the actual sample used in the study.

Based on Statistics Botswana (2011), Shakawe had the highest number (1487) of household heads (HHs), followed by Tubu (118) and Shorobe (64). Using a proportional representation of HHs, it then follows that the target sample was 315, 91 and 55 for Shakawe, Tubu and Shorobe, respectively, or 461 HHs in total. A discrepancy occurred in Shakawe where we failed to meet the target by 1 HH, and in Tubu where we failed to meet the target by five HHs; there was no discrepancy in Shorobe. Thus, a total of 455 interview schedules (translated into the local language, Setswana) were administered to HHs by five well-trained research assistants. While only one key informant was interviewed from the Water Utilities Corporation (WUC),[1] eight were interviewed from the Department of Water Affairs (DWA).

3.2 Instrumentation and measurement of variables

The instruments for data collection comprised a household interview schedule, focus group discussion (FGD) and interview guides, all designed to elicit relevant information on stakeholders' perceptions about the customary and statutory management of water resources. In addition to the use of FGD and key informant guides, the choice of questionnaire

[1]For reasons best known to them, it was very challenging to get the officials of WUC to grant interviews.

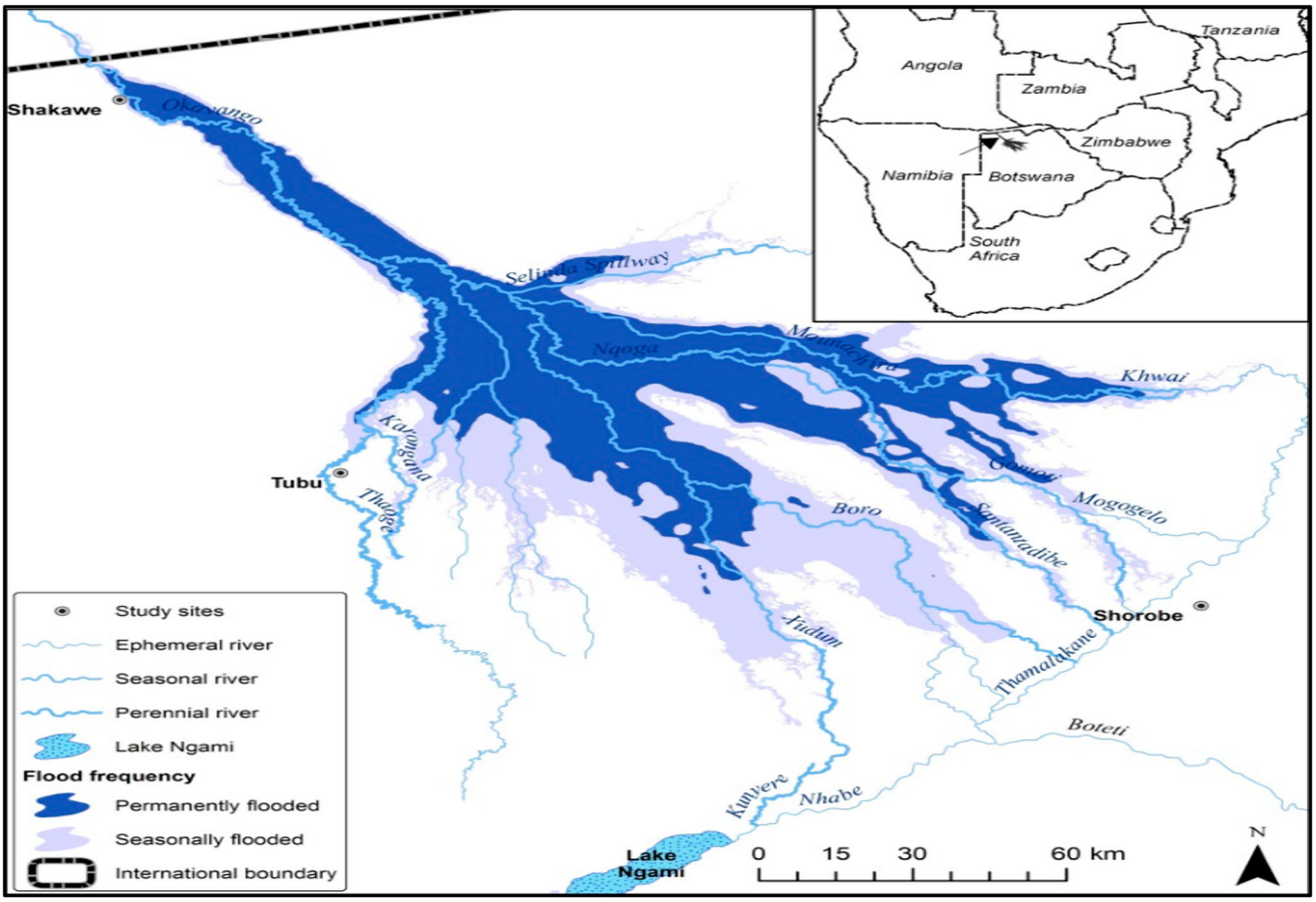

Figure 1. Map of the study area (source: Okavango Research Institute GIS Lab, 2016).

Table 1. Villages, total number of household heads, and target and actual sample sizes.

S. no.	Village	*Total number of household heads	Target sample size $n = \frac{N}{1 + N(e)^2}$	Actual sample
1	Shorobe	64	55	55
2	Shakawe	1487	315	314
3	Tubu	118	91	86
Total		**1669**	**461**	**455**

n = stands for number of households
*Source: Statistics Botswana Central (2011). **Field survey: June–October 2018.

and interview schedule as data collection tools was informed by the fact that these tools yield data within a very short space of time (Birmingham and Wilkinson, 2003), and that it is relatively easy to analyse data from them using the Statistical Package for the Social Sciences (SPSS) or other computer-based data analysis tools (Rowley, 2014). Respondents' perceptions were measured through a set of items or statements on both customary and statutory water management institutions, which were placed on a 5-point Likert scale ranging from "strongly agree" (SA) through "agree" (A), "undecided" (U) and "disagree" (D) to "strongly disagree" (SD). Responses on customary water management were assigned 5 points for "SA", 4 points for "A", 3 for "U", 2 for "D" and 1 for "SD." In contrast, the scores were assigned in the reverse order for responses on items addressing statutory water management (see Tables 2–7). Respondents' average scores were then computed and a perception score was obtained. Demographic, socio-economic and cultural variables either measured or coded in relation to cultural water management issues included religion (which was coded), income (measured by the amount earned per month by the HH), level of education (measured by the number of years the HH has spent on formal education), age (measured by the number of years which the HH had lived) and gender (coded on the basis of whether the HH was male or female). FGD and interview guides were also designed to capture perceptions of HHs and water agency (Water Utilities and Department of Water Affairs) officials, respectively, on cultural issues in water management in the Okavango Delta.

An FGD guide is a very useful tool for collecting qualitative data as it is easy to obtain detailed information on personal or even group perceptions (Nyumba *et al*., 2018). Besides saving money and time as compared to individual HH survey interviews, an FGD session provides the opportunity to seek clarification (Tindale and Winget, 2019) and useful materials (e.g. direct quotes from participants) (Flick, 2018).

3.3 Data collection

Data were collected using interview schedules and key informant interview and FGD guides. Prior to the study, research ethics clearance was sought and obtained from the University of Botswana's Institutional Review Board

Table 2. Demographic characteristics of the study sample.

Variable	n = 455	%	
Religion			
African traditional religion	69	15.2	
Christianity	378	83	
Islam	3	0.7	
Others	5	1.1	
Total	455	100	
Age group			
20–29	121	26.6	M = 42.5
30–39	112	24.6	SD = 16.2
40–49	85	18.7	
60 +	137	30.1	
Total	455	100	
Education level			
None	71	15.6	
Primary	142	31.2	
Secondary	218	47.9	
Tertiary	24	5.3	
Total	455	100	
Employment			
Employed	62	13.6	
Unemployed	393	86.4	
Total	455	100	
Source of livelihoods			
Small-scale mixed farming	270	59.3	
Self-employed	71	15.6	
Ipelegeng	99	21.8	
Tandabala	15	3.3	
Total	455	100	
Income group			
Less than P1500	412	90.5	
P1500–P2000	19	4.2	
P2500–P3000	14	3.1	
P3500–P4000	2	0.4	MD = P945.60
P4500–P5000	4	0.9	SD = 0.73
P5500+	4	0.9	

n = stands for number of households.
Source: Field survey, June–October 2018.

Table 3. Household heads' perceptions of water as therapeutic (n = 455).

Statement	SA	A	U	D	SD
There are sacred water points in this village.	88(19)*	162(36)	42(9)	45(1)	118(26)
Besides using water for domestic purposes, we also use it for religious devotions.	280(62)	106(23)	29(6.)	11(2.2)	29(6.4)
There are religions in this community which regard water sources as sacred.	108(24)	163(36)	39(9)	40(9)	105(23)
People in this village see water as having a religious/cultural value.	269(59)	126(28)	29(6)	9(2)	22(5)

n = stands for number of households; SA = Strongly Agree; A = Agree; N = neutral; D = Disagree; SD = Strongly Disagree
Source: Field survey, June–October 2018. *Percentages in parentheses.

Table 4. Household heads' disposition towards water as life (n = 455).

Statement	SA	A	U	D	SD
Snakes, frogs and crocodiles are creatures associated with water taboos.	205(45)*	163(35)	45(10)	17(4)	25(6)
If one kills a frog in a sacred water source, the source dries up.	62(14)	46(10)	147(32)	35(8)	165(36)
There are spiritual beings in sacred water sources.	151(33)	168(37)	74(16)	19(4)	43(10)
There are proverbs which talk about water in our culture.	95(21)	144(31)	168(37)	18(4)	30(7)

n = stands for number of households; SA = Strongly Agree; A = Agree; N = neutral; D = Disagree; SD = Strongly Disagree
Source: Field survey, June–October 2018. *Percentages in parentheses.

(or Ethics Committee). After obtaining clearance from the review board, the Ministry of Land Water and Sanitation Services (which is the overall institution for water management and governance in Botswana) approved the research permit to carry out the study. Throughout data collection, a respondent's consent was sought before the interview. Consequently, the sample of 455 HHs comprised those who agreed to participate in the study, as against the 461 HHs which were initially intended for the study. To further ensure that the study meets ethical considerations, data were collected anonymously by concealing the identities of the respondents (see Flick, 2018). HHs were interviewed based on the assumption that they were the most knowledgeable persons, especially in relation to cultural water management practices. As key informants would serve as a ready source of some in-depth information related to water management, six key informants were also interviewed. For instance, questions relating to water taboos and water management at the local level, and those relating to statutory water management practices at the national level, could only be adequately answered by key informants. Key informants were, therefore, consulted frequently as sensitive issues arose, and a final meeting was held with all of the key informants to further clarify some of the issues that emanated from the previous discussions. One FGD session, which included both females and males, youths and elderly, was organised in each of the three villages selected for the study. A total of 51 participants took part in the three FGDs, comprising 12 participants from Shorobe, 24 from Shakawe and 15 from Tubu. A third FGD comprising 14 participants was organised specifically for the DWA officials and was conducted in Gumare. In total, 65 participants took part in the FGDs within the study area. Both the FGDs and interviews were conducted in the local language (Setswana) and focused on the broad theme of dissonance between customary and statutory water management institutions. Notes were carefully taken for analysis. The FGDs provided opportunities for organised discussion of issues, which enabled the researchers to gain

Table 5. Household heads' perceptions of water taboos (n = 455).

Statement	SA	A	U	D	SD
There are taboos relating to water abstraction from water source.	161(35.4)*	110(24.2)	37(8.1)	74(16.3)	73(16)
Taboos are set and enforced by chiefs.	55(12.1)	32 (7)	49(10.8)	177(38.)	142(31.2)
There are sanctions for failure to comply with taboos for water use.	132(29)	116(25.5)	71(15.6)	64(14.1)	72(15.8)
I came to know taboos for water use through folktales from elders.	100(22)	56(12.3)	49(10.8)	165(36.)	85(18.7)
Local water taboos were meant to monitor and control water pollution.	159(34.9)	121(26.6)	66(14.5)	52(11.4)	57(12.6)

n = stands for number of households; SA = Strongly Agree; A = Agree; N = neutral; D = Disagree; SD = Strongly Disagree
Source: Field survey, June–October 2018. *Percentages in parentheses.

Table 6. Household heads' perceptions about water in the Setswana culture (n = 455).

Perception statement	SA	A	U	D	SD
In Tswana culture, when drought persists traditional rain-making ceremonies are conducted.	316(69)*	80(18)	7(2)	20(4)	32(7)
In Tswana culture, the belief is that some people are rainmakers.	231(51)	70(15)	21(5)	33(7)	100(22)
Cultural values have no role in water management.	53(12)	87(19)	51(11)	142(31)	122(26.8)
Water is *God-given*, and people must get it free of charge.	243(53)	84(19)	12(3)	64(14)	52(11)
Water has an *economic value*, and people must pay to access it.	58(13)	163(36)	15(3)	74(16)	145(32)
Spirit mediums play a crucial role in water management.	161(35)	151(33)	52(11)	57(13)	34 (8)
We need to revive rain-making ceremonies in our village to boost the amount of rain we receive.	190(42)	136(30)	32(7)	53(11)	44(10)

n = stands for number of households; SA = Strongly Agree; A = Agree; N = neutral; D = Disagree; SD = Strongly Disagree
Source: Field survey, June–October 2018. *Percentages in parentheses.

Table 7. Household heads' perceptions towards statutory water institutions (n = 455).

Perception statement	SA	A	N	D	SD
People in this village don't know about government water law.	287(63)	127(28)	14(3)	14(3)	13(3)
Government water laws need to be explained to the people in this village.	147(32)	127(29)	35(8)	66(14)	80(18)
It is wise for offenders of water law to be tried at the Kgotla.	203(46)	129(24)	31(7)	49(10)	43(10)
Local leaders are respected more than WUC and DWA officials.	194(46)	95(20)	50(11)	57(12)	59(13)
People who fail to pay for water must be disconnected.	59(1)	62(13)	16(4)	98(21)	220(48)

n = stands for number of households; SA = Strongly Agree; A = Agree; N = neutral; D = Disagree; SD = Strongly Disagree
Source: Field survey, June–October 2018. *Percentages in parentheses.

further insights into the people's perceptions of certain meanings and practices relating to water management in the study area. For instance, village chiefs (*dikgosi*) and elders were believed to be the most important sources of information on local water taboos, ancestral matters (*badimo*) and customary water management practices in general, while the officials within the DWA and WUC were very useful in giving insights into statutory water management practices. The opinions of the DWA and WUC officials and those of *dikgosi* were useful as a way of testing the general dissonance between customary and statutory water management practices in the study area.

3.4 Data analysis

Descriptive (frequency, percentages, measures of central tendency and dispersion) and inferential (Mann–Whitney U and Kruskall–Wallis tests) statistics were used to summarise the quantitative data and make deductions, respectively. Mann–Whitney U and Kruskall–Wallis tests (which consider a comparison between two and many groups, respectively), were performed to understand the differences in the

Table 8. Differences between customary and statutory institutions (as perceived by key informants).

S. no.	Customary institutions	Statutory institutions
i	Presided over by elders, chiefs, spirit mediums	Presided over by government officials
ii	Restorative decisions	Adversarial decisions
iii	Litigation aims at reconciliation	Litigation aims at punishing the wrongdoer
iv	Unwritten, embodied in maxims and daily observations	Documented as policy, act and management practices
v	Vary from area to area	Uniform nationally
vi	Transmission is by word of mouth	Transmission is by written documents
vii	Litigants attend courts locally	Litigants travel long distance to attend courts
viii	Use of local language in trials	Language used is technical English

perceptions of male and female respondents on cultural issues on water resources management. Qualitative data obtained from key informants and FGD guides were thematically analysed; themes such as *water as therapeutic* and *water as life* were derived and analysis was conducted under each of the themes.

4 Results and discussion

4.1 Demographic and socio-economic profile of respondents and their perceptions on water

Figure 2 shows the distributions of respondents by age and sex. The data reveal that the majority (62.9%) of HHs were female and that the mean age of HHs was 42.5 years old with a standard deviation of 16.24. The majority (69.9%) of the respondents were below 50 years of age and the rest were 60 years old or older. As water use varies significantly between people of different sexes (Jordán-Cuebas *et al*., 2018), gender then becomes a vital variable in water management issues (Van Koppen, 2018). Females are perceived to use more water than males because they carry out more water-related activities than their male counterparts in a traditional society at the household level (Jordán-Cuebas *et al*., 2018). While a study by Jordán-Cuebas *et al*. (2018) showed that females take longer showers than males, another study by Fink (2011) on gender roles indicated that females have a higher level of knowledge about water conservation than do males, who are less frequently engaged in water conservation, particularly at the household level. A Mann–Whitney U test (which considers a comparison between only two groups) was performed to determine the difference in the perceptions of male and female respondents. The results revealed, however, that there was no statistically significant difference ($U = 23860$, $p = 0.82$) in the perceptions of males and females regarding cultural issues surrounding water management practices in the Okavango Delta.

A Kruskal–Wallis test (which allows for a comparison among more than two groups) was performed to determine the difference in the perceptions of HHs of different age groups in the study area. The results revealed that there was no significant difference ($X^2 = 8.2$, $p = 0.09$) in respondents' perceptions across five age groups (see Table 1). To further ascertain the authenticity of the results, a one-way between-groups analysis of variance (ANOVA) was conducted to explore the impact of age on respondents' perceptions about cultural issues in water management practices in the study area. There was also no significant difference ($F = 2.1$, $p = 0.08$) in the perceptions of the five age groups. The actual difference in mean score amongst the groups was quite small. The effect size calculated using eta squared was 0.02, which, according to Cohen (2004), is considered a small effect size. It is, therefore, concluded that HHs of different age groups did not perceive cultural issues on water management practices differently in the study area. This is because older people in the Okavango Delta were devoted to cultural issues on water management and believed that culture plays an important role in the management of water. Thus, old people tend to adhere to the cultural ways of water management, and they tend to pass on the knowledge to their children. As old people (including chiefs), particularly in rural Botswana, are well respected (Vaughan, 2003), people of all age groups appreciate and respect their viewpoints. Given that the influence of mass and social media probably did not have a significant impact on rural people's viewpoints on water management issues, this implies that the cultural viewpoints of old and young people in this study would not differ from each other.

Data in Table 1 indicate that the majority (83%) of the respondents were Christians, while the fewest (0.7%) were Moslems. While 15.2% of the respondents practised African Traditional Religion (ATR), 1.1% of them belonged to other faiths. A Kruskal–Wallis test was performed to test whether there was a difference in perceptions of cultural issues surrounding water management among HHs of different religions in the study area. The results indicated, however, that there was no significant difference ($X^2 = 0.87$, $p = 0.25$) in their perceptions. As religious practices draw attention to people's spirituality, the finding might imply that HHs of different religious backgrounds in the area had the same perceptions about the spiritual importance of water in their day-to-day living experiences. The findings are similar to studies conducted by Akpabio (2012) in Nigeria, Nkonya (2006) in Tanzania and Shoko and Naidu (2018) in Zimbabwe, where it was found that water resources were enormously valued and were deemed sacred within the ATR and other religions. Chuvieco's (2012) and Briney's

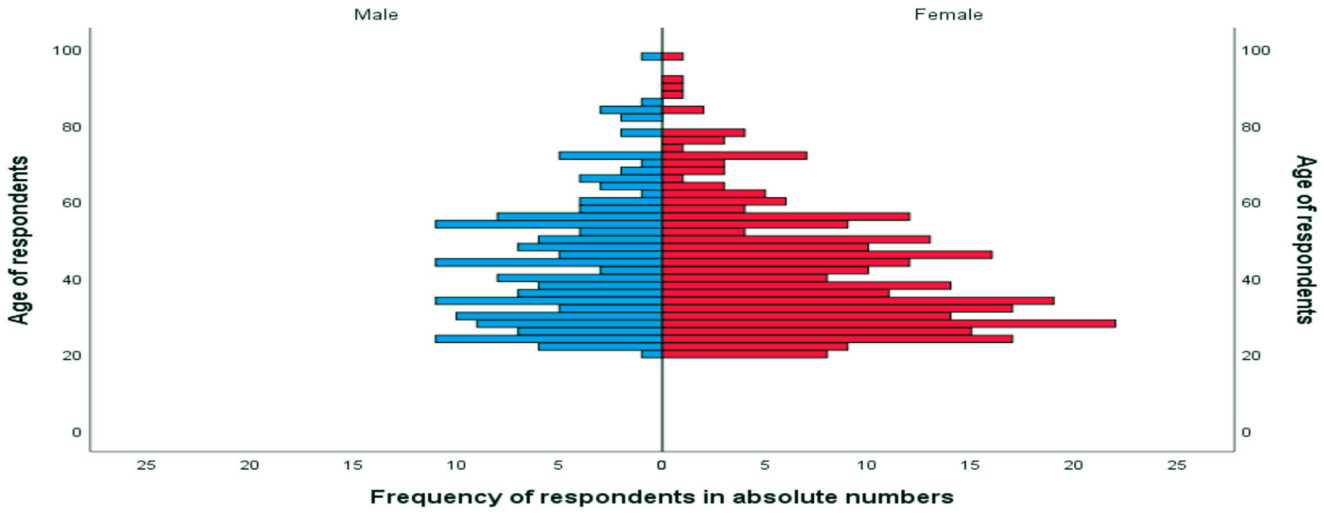

Figure 2. Age–sex pyramid of respondents (source: field survey June–October 2018).

(2018) studies also buttressed the strong impact of religion on individuals' opinions on water management and use. Similar to the spiritual connotation of water in Christianity and Islam (Briney, 2018), ATR devotees also perceive water as a sacred symbol (Owomoyela, 2002). Water appears frequently in prayers, teachings, rituals and sacred writings in Christianity, Islam and other major religions. For instance, there are several references to water in the Bible wherein it is perceived as serving three roles, being a source of life and a sign of hospitality, and performing a spiritual cleansing (Briney, 2018; Chuvieco, 2012). The transformative power of water through baptism is evident in Christianity and other religions. For instance, Briney (2018) offers insight on this in relation to Hinduism:

> According to the myth of Ganges, the goddess Ganga descended from heaven to dwell in the waters of the Ganges River to protect, purify and bring to heaven those who touch it. Thus, Hindus visit the river daily to offer flowers and food to Ganga. They also drink the water and bathe in the river to cleanse and purify their sins.

Furthermore, both Christians and Hindus perceive water to be therapeutic. This is in agreement with the perceptions of key informants who also regarded water as a healing substance. Thus, one key informant remarked:

> People in this village use water from sacred places such as Tsodilo Hills even today. In our church we use water through the direction of the Holy Spirit, that we should use water from certain places. Even the traditional healers use water from sacred places. We still believe that water can cure diseases and cast out evil spirits (personal communication, September 2018).

Data in Table 1 show that while 15.6% of the respondents had no formal education, 31.1% of them had attended primary education. The majority had attended secondary (47.9%) while only 5.3% of them had tertiary education. A Kruskal–Wallis test was performed to test whether there was a significant difference in perceptions of cultural issues surrounding water management among people of different educational status in the Okavango Delta. The results indicate that there was no significant difference ($X^2 = 1.44$; $p = 0.7$) in the perceptions of HHs across different educational levels. This implies that the education status of the HHs might not necessarily influence their perceptions of cultural issues relating to water management in the area. These results contradict those of Yan (2015) who found that the education status of an individual did have a major influence on how that individual perceives different water management practices. The differences between Yan's (2015) results and those of this study might be related tothe study sites, as Yan (2015) carried out his study in an urban setting, in contrast to the current study which was conducted in a rural area. The data also show that there was a high percentage (86.6%) of unemployment in the study area. A Chi-squared test (X^2) for independence was used to determine the association between gender and employment status. The results imply no association ($X^2 = 2.01$, phi = 0.42) between gender and employment status of HHs.

Ethnicity is a social classification of people based upon their shared cultural characteristics and heritage (Castree, Kitchin and Rogers, 2013). The identity of a certain ethnicity is based upon characteristics of beliefs, values, language, religion and traditional experiences of an individual (Castree, Rogers, and Kitchin, 2013). The data show that there were nine ethnic groups in the three villages of Shakawe, Shorobe and Tubu (see Figure 3). The majority (78%) of the respondents were BaYeyi and were more prominent in Shakawe than the other two villages. The BaTawana were the second largest (8.4%) ethnic group in the study area. A Chi-squared test (X^2) for independence was used to determine the association between the ethnicity of the HHs and their religions. The results imply that there was no association ($X^2 = 9.96$, phi = 0.15) between ethnicity and religion in the Okavango Delta.

The historical background of the different ethnic groups revealed that their economic activities were water related, and hence water played a central role in economic activities other than domestic use. Data show that HHs' livelihood

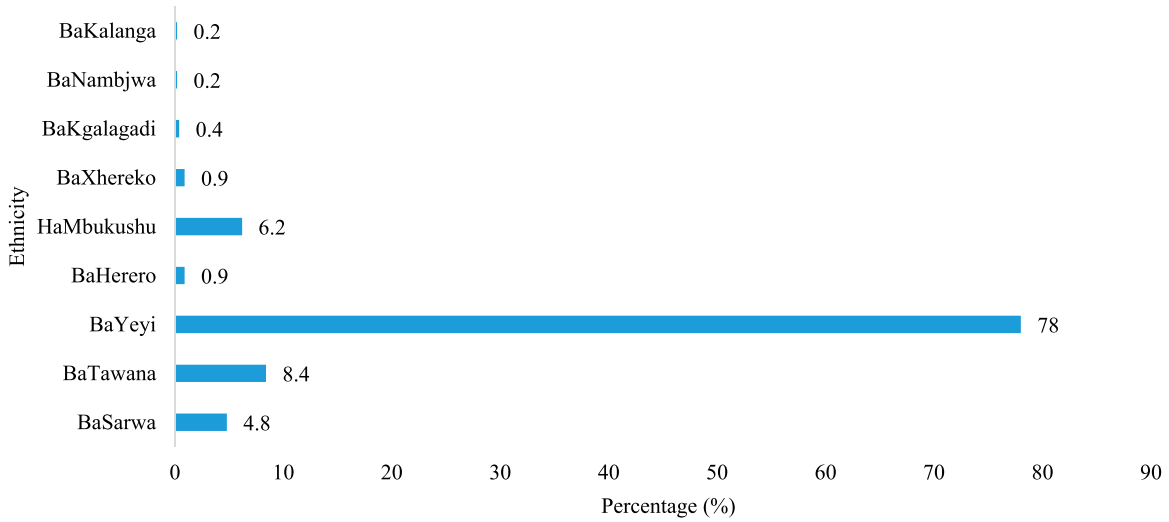

Figure 3. Ethnicity of household heads in the study sites. Sources: Field survey, June–October 2018.

sources included small-scale mixed farming (59.3%), self-employment (15.6%), *Ipelegeng* (21.8%) and *Tandabala* (pension; 3.3%). The majority (90.5%) of HHs earned less than P1500.00 per month, and only approximately 2.0% of them earned more than P4500.00 per month. A Chi-squared test (X^2) for independence indicated that there was no association between the source of income of the HHs and the nature of the employment ($X^2 = 12.85$, phi = 0.17).

4.2 Cultural concerns regarding water management practices

Culture is an integrated system of learned behaviour patterns that are unique characteristics of the members of any given society (Amerson, 2018). In the context of this study, it includes everything that a group thinks, says, does and makes about water. Thus, it covers religion, language and shared systems of attitudes towards water. Empirical evidence has shown that one specific issue of water resources management in the Okavango Delta surrounds the sustained perceptions about sacred water sites. According to Akpabio (2011), sacred water sites are linked to a deity and are important for water governance and conservation. Findings in this study indicate that elderly people perceived water as life, and hence they had developed management strategies and devised methods to monitor people's adherence to these management strategies. Table 2 shows the perception of HHs regarding water as therapeutic. The analysis shows that the majority (55%) of HHs strongly agreed or agreed that there were sacred water points in the three villages under study. While 9% of the respondents were undecided as to whether or not there were sacred water points in their village, only 1% disagreed and 26% strongly disagreed with this viewpoint. Water is used not only for common domestic purposes such as washing, cooking, bathing and drinking; it is also important for religious devotions. Christians and ATR devotees mostly agreed that water is used in devotions. The majority (85%) of the respondents either strongly agreed (62%) or agreed (23%) with the assertion that "[b]esides using water for domestic purposes, we also use it for religious devotions." The results buttress the view that water is the *fons et origos* – meaning water is the source of all possible existence (Eliade, 1958), and that it is unsurprising to find hydrolatry in every cultural and temporal context (Strang, 2005). However, 6.4% of the respondents had no opinions on the subject, and some of the HHs strongly disagreed (6.4%) or disagreed (2.2%) with the statement.

The majority (60%) of the respondents strongly agreed (24%) or agreed (36%) that "[t]here are certain religions, which regarded water sources as sacred." While 9% of the respondents were neutral, 32% of them did not support the statement. A total of 87% of the HHs either strongly agreed or agreed that the "[p]eople in this village see water as having a religious/cultural value." While 6% of the respondents were neutral and therefore did not have an opinion on the subject, only 7% of them disagreed or strongly disagreed with the statement. The distribution of HHs by their disposition towards water as life (Table 3) indicates that the overwhelming majority (80%) of them strongly agreed or agreed that "[s]nakes, frogs and crocodiles are creatures associated with water taboos." Whereas 10% of the HHs were neutral, 10% either disagreed or strongly disagreed with the statement. This finding supports Strang's (2005) work in which water creatures are regarded as intriguing anthropological objects reflecting ways in which indigenous people use them as an imaginative resource. Also, Briney (2018) is of the belief that water creatures indicate historical narratives and reveal critical transitions in religious beliefs and human water engagement in indigenous societies.

Few (24%) of the HHs either strongly agreed or agreed with the statement that "[i]f one kills a frog in a sacred water source the source dries up." Furthermore, 32% were neutral about the statement, while 44% of them either disagreed or strongly disagreed with the statement. For instance, a key informant in Shakawe community claimed that

> There used to be many sacred water points in our village but due to people of other religions who came and killed water creatures like crocodiles and frogs, we no longer have sacred water sources in here except for Tsodilo water points.

The majority (70%) of the HHs opined that "[t]here are spiritual beings in sacred water sources." This implies that the people in the Okavango Delta regard water sources as sacrosanct. These findings are similar to those of Shoko and Naidu (2018) in Zimbabwe, that water sources were enormously valued and were deemed sacred.

Proverbs are a powerful and effective instrument used to illustrate and buttress the wisdom of the cultural code of conduct and for the transmission of manners and values of indigenous people from generation to generation (Manyozo, 2018; Mapadimeng, 2018). Thus, proverbs help in inculcating perceptions which enhance the sustainable utilisation and management of water resources. In the current context, 52% of the HHs strongly agreed or agreed that "[t]here are proverbs which talk about water in our culture," while 11% of them either disagreed or strongly disagreed with the statement. Thus, the majority (52%) of key informants interviewed were aware of proverbs which were devised to enhance water use sustainability. Based on the feedback from key informants in Tubu, it is clear that the Batswana culture is replete with proverbs. For instance, one chief said "[*m*]*aru ga se pula, mosimolelo*," which literally translated means clouds are not rain, but smoke is fire, and "[*m*]*oselewa pula o epiwa go sale gale*," which is literally translated to mean make hay while the sun shines. These proverbs imply that as water gives life it then follows that the Batswana must preserve the available water, as rain is not guaranteed within the Okavango Delta.

A taboo is an activity that is forbidden or sacred based on religious beliefs or morals (Tetlock, 2003). A taboo could also be a strong prohibition relating to any area of human activity or custom that is sacred or forbidden based on moral judgment, religious beliefs or cultural norms (Wallace, 2004). Breaking a taboo is extremely objectionable in a traditional society. Around the world, an act may be taboo in one culture and not in another (Brown *et al*., 2008). Such prohibitions are present in virtually all African rural societies and perhaps elsewhere too (see Eriksen, 2001). The analysis shows that HHs in the study area perceived taboos as crucial in water conservation issues.

Although taboos are not officially recognised in water management in the Okavango Delta, Colding and Folke (2001) opine that they exist in most cultures, Western and non-Western, and have a crucial role in guiding human conduct regarding the utilisation of natural resources. A cumulative

59.6% of the HHs (Table 4) strongly agreed and agreed that "[t]here are taboos relating to water abstraction from water sources." HHs asserted that their forefathers had ways of achieving water conservation and mitigating water pollution from various anthropological activities. While 8.1% of the HHs did not have any opinion on the issue, 32.3% of the HHs either disagreed or strongly disagreed with the statement. Some 19.1% of the respondents either strongly agreed or agreed that "[t]aboos are set and enforced by chiefs." While 10.8% of the HHs were neutral and hence did not reveal an opinion on the subject, the overwhelming majority (70.1%) of the HHs disagreed or strongly disagreed that "[t]aboos are set and enforced by chiefs." Also, 54.5% of the HHs opined that "[t]here are sanctions for failure to comply with taboos for water use." However, while 15.6% of the HHs had no opinion, 29.9% of them disagreed or strongly disagreed with the statement. Approximately one-third of HHs (34.3%) felt that they "came to know taboos for water use through folktales from elders." While 10.8% were neutral, the majority (54.9%) of them either disagreed or strongly disagreed with this statement. The majority (61.5%) of the HHs either strongly agreed or agreed that "[l]ocal water taboos were meant to monitor and control water pollution." While 14.5% of the HHs were neutral on this issue, 24% of them either disagreed or strongly disagreed with the statement. This implies that cultural factors such as taboos continue to influence people's beliefs in water management in the Okavango Delta despite rural people's exposure to the influence of modernisation. The perceptions in the three villages indicate that people believe water comes from God. This contradicts the modern statutory institutions, which see water as an economic good. A key informant interview indicated there were renowned people in the villages who had supernatural powers to make rain. The narrations by some village chiefs support the notion that people in the Okavango Delta believe in rain-making. One of the village chiefs had this to say on rain-making:

> When people anticipated drought, which we used to do by observing stars like selemela [a type of star] and if there was any interpretation known by the chief, Kgosi would call the kgotla, and the belief was that there was [a] nkgodi [an eagle] that had laid some eggs somewhere. Kgosi would then assign people to find the nest and if found the villagers would be requested to bring their daughters [who are virgins of about 19–21 years] for the ritual known as go phekola. The rain-making ritual is performed by cutting and burning the tree with the nest. The virgins would, therefore, bring clay pots containing water from the river to the ritualist[s] [Kgosi and elders] who then put the pot on the fire. The water is mixed with crushed pieces of "chobachobane" [a herb]. After boiling, the steam from the pot would disperse into the sky. This eventually forms some clouds which then causes the rain to fall. (Kgosi, 28 September 2018)

A key informant gave a detailed explanation of what the rains depict for Batswana:

> Pula is a Setswana word which is used to represent three related meanings. The word pula means rain, which is scarce in Botswana's semi-arid climate. Almost half of Botswana is desert and pula is in great demand. It is therefore no wonder that pula is the word that is used by Batswana to wish others well. This demonstrates that for a long time Batswana have always lived in very challenging, dry environments where there is rain scarcity. Scarce rainfall depicts poor crops, weak or no livestock and great poverty. The lack of pula usually led to the fragmentation of the morafe [ethnic groups] as part of the morafe would break away in search of water and fertile grazing land elsewhere.

Anther key informant concurred on the cultural meaning of water (rain), saying:

> The presence of pula marks the abundance of water to drink, grass for animals, milk, healthy beasts, good number of wild animals for hunting and happiness all around in the morafe. Therefore, Batswana over time used the word Pula as a cry to God to wish life, fertility, progress and prosperity on the people and land. Pula! Batho betsho! [Rain! Rain everyone!].

The literature has shown that in the Tswana culture some people are rainmakers (Segadika, 2006). This perception is popular in the study area. Local knowledge and discourse regarding water were shaped by cultural factors which were expressed more in beliefs, taboos, norms and spiritism than in terms of its physical properties in prehistoric times in the Okavango Delta and elsewhere. Table 6 shows the responses to the assertion that some people in Tswana culture are rainmakers. It indicates that some respondents strongly disagreed (22%) or disagreed (7.3%) with the notion, while the majority (66.2%) of the respondents agreed or strongly agreed with the viewpoint. One key informant remarked thus:

> Pula has been so central to the Tswana society that for many centuries the role of the moroka [rainmakers] has remained central to the survival of Batswana, especially those in moraka [cattle post]. This role was condemned by the missionaries, as they centralized God and Jesus in the daily affairs of men and women. Besides the disapproval of the practice, even today at Tsodilo Hills, there is a spring containing water of prominent spiritual importance and sites where rainmaking ceremonies were performed by our forefathers. (personal communication with key informant, 28 September 2018)

The majority (87%) of the HHs opined that "[i]n the Tswana culture when drought persists traditional rain-making ceremonies are conducted" (Table 6). While 2% of the HHs were neutral, 11% of them either disagreed (4.4%) or strongly disagreed (7%) with this assertion. Furthermore, most (66.2%) of the HHs agreed it is commonly believed in the Tswana culture when drought persists traditional rain-making ceremonies are conducted. About half of the respondents strongly agreed (51%) while some agreed (15.4%). While 5% of the HHs were neutral, some either disagreed (7%) or strongly disagreed (21%).

Also, some HHs disagreed (31%) or strongly disagreed (26.8%) that "[c]ultural values have no role in water management," implying that most (57.8%) HHs were of the opinion that cultural values play a significant role in water management. An interview with a key informant who is a devotee of customary institutions revealed that villagers in the

Okavango Delta regard water as sacrosanct. One key informant opined that "[w]ater from Tsodilo hills has a spiritual value to both Christians and non-Christians and it is often used to cleanse bad luck amongst people in our community and it works according to the faith of the user." This observation is similar to the results of studies conducted by Huggins (2000) in Kenya and Tanzania and Nguyen and Ross (2017) in Vietnam, where in both cases water sources were enormously valued and were deemed sacred by the indigenous people. However, 27.8% of HHs in the present study opposed the viewpoint that cultural values play a significant value in water management. These contradictions in perceptions amongst HHs are attributed to the differences in religious affiliation as well as age. The data analysis showed that old people, especially those affiliated with ATR and who naturally were sympathetic towards the use of cultural practices in the management of water, had positive perceptions about the appropriateness of customary institutions in water governance. However, the younger generation and adherents of Christianity had negative perceptions about cultural practices in water management. This observation is in agreement with the literature which demonstrates that elderly people are custodians of cultural values within a traditional society (Mkabela and Nyaumwe, 2007). One participant in the FGD who opposed customary institutions opined that "[l]ocal people's knowledge about water management in the Okavango Delta is very low and is purely spiritual and as such very difficult to apply in the modern day water management … ." Also, the majority (72%) of the HHs strongly agreed (53%) or agreed (19%) that "[w]ater is God-given and therefore people must get it free of charge," whereas 3% HHs were neutral and 26% of them did not agree with the statement. This finding agrees with that of Akpabio, who found that indigenous people in Nigeria believe water is a free gift from God, and like Him water is perfect (see Akpabio, 2011). The failing of this viewpoint is that even when the physical quality of water is very poor, it cannot be questioned as inappropriate for drinking purposes (see Gondo *et al*., 2018). Almost half (49%) of the HHs strongly agreed (13%) or agreed (36%) that "[w]ater has an economic value and so people have to pay to access it." Conversely, in Withanage's (2015:23) opinion,

> Water is not a commodity and must not be left to the whims of the market because no person or entity has the right to profit from it. Water must not, therefore, be commodified, privatized, traded or exported for commercial gain. Water must be excluded [from] being a "good," a "service" and an "investment" in all international, regional and bilateral trade agreements.

Although Withanage's (2015) viewpoint is plausible, it is perhaps unrealistic for governments to continue to provide treated water free of charge to consumers, particularly in a developing economy where the cost of governance is daunting and where other unfavourable intervening factors could sabotage the dividend of quality public service to the poor majority. Ideally, the provision of a water subsidy meant to alleviate the suffering of the poor might be worthwhile to explore. While only 3% of HHs were neutral, the majority (67%) believed that "[s]pirit mediums play a crucial role in water management," Thus, the results of this study are similar to the findings of Muyambo and Maposa (2014) in Zimbabwe that indigenous people link water bodies with the concept of sacredness which people should approach with a sense of awe and unquestionable homage. While only 11% were neutral the majority (68%) believed that "[s]pirit mediums play a crucial role in water management. However, 13% of them disagreed and 8% strongly agreed with the statement.

The results of this study indicate that people in the Okavango Delta value the rains. Findings from key informants show that there are many ways rain and water are celebrated in the Okavango Delta (and, indeed, in the country). According to one key informant, children born during the rainy season are called *Mmapula* (for girls) or *Rapula* (for boys). This clearly shows that water resources are valuable in the Tswana culture, hence the association of names with rain (water). Denbow and Thebe (2006) indicate it is also not uncommon to see young children dancing and jumping in the rain, and chanting *Pula nkgodisa* (rain makes me grow) whenever there is a downpour – a perception associated with the practice that encourages vitality and healthy growth of young children. Furthermore, in the Okavango Delta, water is culturally used in different ceremonies. For instance, one informant said:

> When there are prominent national celebrations or key national gatherings to be addressed by the highest officials in the land, including the president, the chanting slogan is often Pula. In fact, when the said officials of high standing conclude their speeches, they end with chants of Pula – at least three times. The crowd enthusiastically responds similarly. This is done in wishing and anticipation for more rain, which gives abundant supplies of water. (personal communication with key informant, 28 September 2018)

Also, in receiving a prominent visitor, the guest is accorded a special welcome with reference to rain. The expression in Setswana goes thus: *Goroga ka Pula* (arrive with rain). Furthermore, when droughts persist for too long, or when rains are delayed beyond the usually expected season, communities hold prayers. During the prayer sessions, the congregation members incessantly chant *Pula, Pula, Pula*! (Denbow and Thebe, 2006). This is done while gazing to the heavens – perhaps in expectation of mystical cloud formation. This is exemplified by a case in which the former President of Botswana Ian Khama, during a series of *kgotla* meetings in 2013, encouraged Batswana to come together to seek divine intervention and collectively pray for rain. In so doing he declared the month of September a month of prayer for rain (Mongwa, 2013). Thus, in the same year (2013) when Gaborone dam ran almost dry, various churches converged at the dam for prayers. Amid song, dance and chants, the men and women in attendance broke into loud heartfelt prayers, hands raised to the skies, begging the Lord above for the heavens to open (Mongwa, 2013).

A cumulative 91% of the HHs (Table 6) strongly agreed or agreed with the statement that "[p]eople in this village don't know about the government water law." This finding resonate with Nkonya (2006), who found that the majority of the rural folk were unaware of government water laws and instead had a strong allegiance to customary institutions for water access and use. Thus, in an FGD, one DWA official concurred with the HHs' viewpoint that people in Shakawe, Tubu and Shorobe were unacquainted with statutory institutions by saying:

> Most people do not know about Water Act (1968) because public awareness campaigns are still to be done by the Department of Water Affairs through the communication department. These public awareness campaigns will soon be rolled out through road shows and kgotla meetings to sensitise communities on government water legislation, policies and regulations.

Consequently, HHs' claim that they were not aware of government water institutions [Water Act (Republic of Botswana, 1968) and Policy (Republic of Botswana, 2012)] supports the notion that awareness campaigns had not been implemented in the area prior to this study, as revealed by key informants at Gumare. A number of HHs in the three villages revealed that they were not involved in the drafting of the 1968 Water Act, nor were they aware that a new Water Act (i.e. Water Bill: Republic of Botswana, 2005) was under way at the time it was launched. Rural people's ignorance of statutory institutions is not uncommon; Kujinga and Jonker's (2006) study in Zimbabwe, which analysed stakeholders' knowledge of water governance transformation, revealed that the majority (80%) of the people in middle Manyame were uninformed about the Water Act of 1998. While 3% of the HHs in the present study were neutral, some 6% of them disagreed or strongly disagreed with the statement "[g]overnment water laws need to be explained to the people in this village," while 60% strongly agreed or agreed. This is similar to the viewpoint echoed by some respondents in Kujinga and Jonker's (2006) Zimbabwean study. A minority (8%) of the HHs were neutral while 32% of them disagreed or strongly disagreed with the statement "[i]t is wise for offenders of water law to be tried at the kgotla." The majority (73%) of the HHs strongly agreed or agreed with this statement. This viewpoint agrees with Malzbender *et al*. (2005, 5) who argue that the responsibility of traditional leaders should be to reconcile discord on water-related issues among community members. Besides, the literature indicates that rural people prefer traditional leadership in the handling of water-related disputes. For instance, Sawunyama *et al*. (2005), in the Limpopo area of Zimbabwe, show that the headman will endeavour to manage any clashes through the *Dare* (traditional court) in the event of communal conflict over water access. This is similar to water arbitration issues in the *Kgotla* system in Botswana. While 64% of the HHs either strongly agreed or agreed that "[l]ocal leaders are more respected than WUC and DWA officials," only 11% of them were neutral and 26% of them disagreed or strongly disagreed. The majority (70%) of the HHs disagreed or strongly disagreed that "[p]eople who fail to pay for water must be disconnected." However, some 27% of them either strongly agreed or agreed with the statement.

Nevertheless, all government officials who were interviewed during this research emphasised the difficulty of involving indigenous people and their indigenous knowledge in water resources management; they perceive local people as lacking the knowledge and capacity to participate in modern water management programmes. Consequently, these government officials believe that the indigenous culture of water management is archaic, mystical and outdated. This agrees with Nguyen and Ross's (2017) study in Vietnam that assesses barriers and opportunities for the involvement of indigenous knowledge in water resources management in the Gam River. This is despite one government official's recognition of local knowledge and local people regarding their capacity to explore underground water resources through the use of simple dowsing rods derived from locally available materials. The government officials based in Gumare community argue that although local knowledge on water management does exist in the Okavango Delta, it does not apply in the twenty-first century where scientific knowledge must inform decision-making in water management. One government official had this to say:

> While local people can be involved in ground water exploration, maintenance and monitoring, indigenous knowledge is not scientific enough to be used in the modern-day water management, and indigenous people in this area do not possess enough knowledge and capacity to participate in water use and planning which requires the application of a very complex knowledge.

The above demonstrates the patronising viewpoints of the adherents of statutory institutions about customary institutions in the Okavango Delta. Government officials thus had negative perceptions about local people they think the local people do not have the requisite knowledge of water resources management, or they think the people's knowledge is generally outdated, largely spiritually constituted or applicable to only local contexts. Ramazzotti (2008), however, discountenances this viewpoint based on his study that assessed customary water rights and contemporary water legislation in India.

4.3 The synergy in customary and statutory water institutions in the Okavango Delta

This section begins by outlining the differences in customary and statutory water institutions based on the perspectives of the Okavango Delta communities. Unlike the statutory institutions that strictly operate through written codes and laws, findings show that customary water institutions in the area are unwritten. This is similar to the customary water management institutions in Zimbabwe, whose rules of access to water are purely oral (Latham and Chikozho, 2004). As also buttressed by Goldin and Gelfand (1975), customary water institutions are validated by community recognition and acceptance, while statutory institutions are authenticated by case law and judicial precedents. The written and codified nature of statutory water institution makes it the preserve of professionals who engage in the "esoteric work of interpretation, application and creation of rules" (Latham and Chikozho, 2004:23). A key informant opined that customary institutions were passed from one generation to the next through oral traditions. Findings also show that tribunals at the *Kgogla* are open to all and that there are no stringent rules for court attendance except that people wearing short trousers are not allowed court access during deliberations at the Kgotla (personal communication with key informant, August 2018). In terms of administrative cost, the key informant said "[c]ustomary water tribunals are cheap and lawyers are not permitted to represent a client during court proceedings at customary courts." This observation shows that customary institutions operate at a minimal cost, if any, unlike the statutory institutions. Also, findings show that litigants seeking redress within the context of statutory institutions travel a great distance to access arbitrations in urban,

areas unlike in customary institutions where the *Kgotla* is readily available within local communities. Whereas the researchers noticed that the DWA offices are located in the relatively urban villages of Gumare and Maun, which are very far from the study areas (Shakawe, Tubu and Shorobe), observational evidence obtained during the study also shows that each of the studied communities has a *Kgotla* system (village court) presided over by the *Kgosi* (chief) and assisted by the *Kgosana* (assistant chief). This resonates with Hook and Raumati's (2011) argument that most structures of statutory institutions are in urban areas and difficult to access for the majority of the rural folk. In terms of communication, findings show that local dialects are used in the operations of customary institutions, unlike in the statutory institutions where the language of proceedings is English, laden with technical law jargon, which makes it difficult if not impossible for local people to understand. In addition, customary water tribunals are meant to encourage decisions that are restorative; the affected party is either compensated or fined. In contrast, a different scenario obtains in the statutory institutions. The Government of Botswana (GoB) 1968 Water Act categorically specifies that:

> A person who is guilty of an offence under sections 9(2) or 36(1) shall be liable to a fine not exceeding P1000 or to imprisonment for a term not exceeding one year, or to both. (2) A person who is guilty of an offence under sections 7(4), 17(2) or 29(3) shall be liable to a fine not exceeding P500 or to imprisonment for a term not exceeding six months, or to both. (3) In addition to the penalties which may be imposed in terms of this section the court may, in the event of a continuing offence, impose a fine not exceeding P10 for each day during which the offence continues.

While the fines have failed to stand the test of time, the fact that they are paid to the state is unfavourable from the point of view of the advocates of customary institutions in the study area.

While it is difficulty to homogenise customary institutions in the Okavango Delta, a synergy of the customary and statutory institutions can be achieved through all stakeholders' consultation. Based on evidence from the GoB Water Bill (Republic of Botswana, 2005; hereafter referred to as 'the water bill'), plans are already underway to synergise water institutions in the Okavango Delta. The water bill has a very crucial component of synergy which recognises the importance of water governance at the village level. The water bill states:

> The Minister, in consultation with the Council and the district council concerned, may establish village water management committees for any village based on the village development committees operating in district council areas as may be appropriate having regard to the nature of the water resources available in the area of the village concerned.

The inclusion of village water management committees in water governance, which is absent in the current GoB Water Act (Republic of Botswana, 1968), is a positive development that could ensure the proper recognition of customary institutions in water governance at local levels. In sum, it is plausible to ensure that all water legislative acts allow enough room for hearing the voices on the other side of the divide through proper consultations in water policy development. In other words, policy processes comprising identification of need and policy formulation and implementation in relation to water access and management within rural communities must integrate the norms and values of local people to alleviate the sour relationship between the government and its grassroots clientele. That way, a sustainable water resource management will have been achieved.

5 Conclusion

With an objective to assess stakeholders' perceptions on the management of water through customary and statutory institutions, the paper has shown that in the Okavango Delta, indigenous people perceive that water is a gift from God which needs to be freely accessed. Statutory institutions, in contrast, recognise water as a commodity which must be sold like any other good. The paper has demonstrated that there is a deep animistic belief in water amongst the local people and that contemporary approaches to water management and governance did not fully conform to local beliefs, norms and expectations of the indigenous people within the study area. For instance, while the results of this study reveal that the majority of the respondents regarded water as a God-given commodity, which people must access free of charge, statutory institutions regarded water as a commodity with a market value, which people must buy and sell like any other goods. Similarly, contradictory perceptions were found by Ramazzotti (2008) and Akpabio (2011) in their studies in India and Nigeria, respectively. While local people had diverse belief systems about water, with some regarding it as sacred and others as secular, it is commonly believed that water has three key functions in the lives of Batswana. These functions depict water as a source of life, a sign of hospitality and a spiritual cleansing substance. As emphasised by Ramazzotti (2008) elsewhere, the findings of this study underscore the complementary legal pluralism in water management in which both customary and statutory institutions are utilised and given equal consideration. In line with the above, local communities' full participation in policy formulation process might provide important information on their values and belief systems that could engender practical, relevant and acceptable water resources management approaches in the Okavango Delta. The study offers an understanding of the importance of cultural and local institutions in transmitting meaning and perceptions about water. It follows that policymakers can utilise it to shape water management policies to align their practices with the cultural code of the indigenous people. Policymakers need to incorporate local cultures in policies to enable local people to understand water projects being implemented in their localities. It must be emphasised that indigenous people's notions of water and its management practices hold implications for the success or failure of state water projects.

This study further demonstrated that Okavango Delta people are not aware of key aspects of statutory institutions for water management, making them resort to local customary institutions to manage water resources as they deem appropriate. Therefore, policymakers and water managers need to translate statutory institutions into the people's first language (Setswana) to allow local people to understand key sections in the water statutes. Given that the use of customary institutions does not need enforcement by external resources, policymakers need to forge and reinforce a link between customary and statutory institutions to reduce the costs involved in water

resource management. This is in agreement with the first Dublin Principle underlying integrated water resources management, which calls for a participatory approach to water management involving all stakeholders including water users, planners and policymakers at all levels.

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Part III

Synthesis

CHAPTER 8

DISSONANCE IN CUSTOMARY AND STATUTORY WATER MANAGEMENT INSTITUTIONS - A SYNTHESIS

DISSONANCE IN CUSTOMARY AND STATUTORY WATER MANAGEMENT INSTITUTIONS - A SYNTHESIS

8.0 Overview

This thesis showed that water institutions were reviewed from a global level and that the review attested to the exclusion or replacement of African Customary institutions by statutory institutions thereby widening the dissonance between the two institutions within the former colonies. The key issues raised in this chapter is the commodification of water resources, which came with the reforms in water sectors. Given the reforms in the sector, governments were compelled to privatise state services and utilities as part of a broader process of capitalist transformation that occurred in the context of globalisation and neoliberalism (Joy *et al*., 2014). Water was transformed into an economic good during the era of water sector reforms thereby contradicting the ideals of Customary institutions indicating that water is never regarded as a private good that can be commodified like any other good. Findings in African researches show that traditional practices exist and are very strongly rooted in rural areas (Dore, 2001; Juma & Maganga, 2005). It is noteworthy, however, that Customary institutions and practices have not been weakened by colonisation (Sulemana, 2013). It has also been noted that failure to accommodate or integrate Customary institutions systems into water management is a source of dissonance between Customary and statutory water management institutions. While indigenous people use their Customary institutions to manage water resources, statutory institutions downplay the role of Customary institutions. A review of the literature showed that African state adopted colonial water management structures and institutions after independence. While the role of Customary institutions in the governance of water resources is crucial, most modern water legal systems in Africa are primarily statute based and state-centric (Mensah and Oduro, 2007). There is, therefore, no room for recognition of Customary institutions. The scenario is the same in Botswana where like in other African states water

management institutions are sympathetic towards statutory rather than Customary institutions. While Customary institutions in the study area are unwritten but place emphases on the culturally prescribed taboos, which underscore values such as water sharing, they are hardly adhered to (Gadzirayi & Chihiya, 2006). Water taboos teach individuals to have self-restraint or discipline in utilisation and discourage wasteful and destructive water use practices. Such rules are culturally reinforced by people's belief in nature spirits (Craig & Gachenga, 2010). Despite all these, statutory institutions in the study area like in other African states continue to focus on statutory institutions like DWA, WUC and Water Act (1968) and Water Policy (2012), which are more urban-oriented and never serve the needs of rural people (Du Plessis and Rowntree, 2003). Water ownership is also an area of dissonance between Customary and statutory institutions. Whereas water can be owned either privately or publicly in statutory institutions, water is perceived as God-given and is granted and entrusted by the Creator to spirit mediums in Customary institutions (Chikozho & Latham, 2005). Thus, in Customary institutions, water is not recognised as a private good like in the statutory institutions thus it is another source of dissonance between Customary and statutory institutions in the study area.

The findings of this study showed that management of water under Customary institutions is based on the belief that all resources including water are owned by ancestral spirits. This belief is very strong amongst the old generation and among devotees of African traditional religion in the study area; old people in the study area believe that water sources such as the Okavango River and Tsodilo water pools were sacred as they serve as the abode of ancestral spirits. Although Botswana recognises the role of traditional leaders as shown by the enactment of its laws as in the case of the Chieftainship Act and Customary Courts Act, the country is silent on the role of traditional leaders and the importance of indigenous knowledge in water resources management. Findings from the study area showed that there is a clear distinction between water ownership and access in rural and urban areas. Whereas the elders and ancestral spirits

are involved in the governance of water resources in Customary institutions, the same role is played by Water Utilities and DWAs in statutory institutions, which do not recognise the role of spirit mediums in water management. In Customary institutions, traditional leaders' control and manage natural resources including water on behalf of ancestors with and from whom they consult and seek advice. Thus, access to water in the study area is gained and governed by one's acceptance as a member of the community and the willingness to respect the ancestral spirits of the locality. It is against this backdrop that water in the study area is perceived as a God-given natural resource under Customary institutions. Thus, water is viewed as having more than the physical form in which it is found; water in the Customary institutions attains a religious dimension and in this way water is a resource that is made available by ancestral spirits through the request of community elders and traditional leaders. However, these notions are antithetical to those of statutory institutions in which water is perceived as a finite resource. This, therefore, engenders the need for different uses and users who compete for water making it easily acquire a commercial value. Since water is a vital, life-giving resource, it may acquire both commercial and political value from the statutory institution's point of view. Consequently, controlling water in statutory institutions becomes a political rallying point.

8.1 SUMMARY OF MAJOR FINDINGS

The general objective of this study was to analyse the factors engendering the dissonance existing between Customary and statutory water management institutions within three rural communities in the Okavango Delta in Botswana.

8.2 ANALYSIS AND DISCUSSION OF FINDINGS

This section deals with the analysis of the findings and their implications for the issues raised in the previous chapters. The analysis and discussion are guided by the research objectives.

8.3 Stakeholders' perceptions of the management of water through Customary and statutory institutions

Society's perceptions of water historically flow in tandem with cultural resources and societal needs (West, 2007). As outlined in the data chapters, statutory institutions provide a blanket framework for water management. As people differ in their perceptions of water resources, it is imperative to hybridise Customary and statutory water management in the study area. It is noteworthy that although the positionality of this thesis could be perceived as legitimising the mechanisms for the hybridisation of the two institutions, it is imperative to stress that Customary institutions are not automatically accepted by all stakeholders nor are they sacrosanct as shown in the results chapters. Paradoxically, the potential for questioning Customary institutions in the governance of water on the one hand and the general legitimacy of statutory institutions, on the other hand, means that cultural institutions can be shared between Customary and statutory institutions and amongst ethnic groups, which is a key attribute of Cleaver's (2001) institutional bricolage theory. Pareto thinks that certain individuals have more power and authority than others in society. When applied to statutory institutions it means that only organisations like WUC and DWS have a monopoly in the water supply as they are believed to possess the expertise required in water management and governance. The imposition of institutions that are alien to the local people is a fertile ground for the dissonance between Customary and statutory institutions. It is important therefore to hybridise Customary and statutory institutions. This may be achieved by modifying both Customary and statutory institutions so that they both are in line with statutory institutions. Findings showed that religious beliefs and preferences influence the preferred type of water point and the realisation of this is important in the management of water in rural areas (Du Plessis and Rowntree, 2003; Joy et al., 2014). This concurs with Cleaver (2001)'s bricolage theory which suggests the hybridisation of Customary and statutory institutions in the governance of water resources. Findings revealed that local people are spiritually connected to water and their livelihoods are based on water. Rural folk regards water as life and have devised locally

recognised water management strategies that are culturally comparable. While it might be impossible to homogenise all indigenous cultural water values into one perspective, as indigenous values are locally and regionally diverse and complex (Agrawal, 2002; Eckert, et al.,2020), there are some commonalities and distinctions from statutory institutions that are important to recognise and understand. Findings revealed that in the study area, indigenous relationships with water are holistic; combining land, water, culture, society and the economy. The findings are similar to Sulemana (2012) who notes that culture is part of local people's water management strategies and everyday lives. Thus, in Customary institutions, everyone and everything is related. Twikirize's (2005) study conducted in Zimbabwe also revealed that rural people are spiritually and culturally connected to water and that the linkage between the two institutions is blurred. Thus, the commercialisation of water is against the ethos of Customary institutions.

8.4 Demographic and socio-economic factors influencing the dissonance existing between Customary and statutory water management institutions

Literature suggests that gender roles demand that women perform tasks such as fetching water. While findings generally revealed that women are mostly responsible for water collection, more males were, nevertheless, involved in water collection at Tubu village. While literature shows that men seldom collect water in rural areas, the situation in Tubu tended to defy the gender roles typical of a rural area in any sub-Saharan African country. The transformation of gender roles at Tubu agrees with the assertion that men only collect water for women when their wives are sick or when the improved water sources are broken down and the other sources are too distant for women (Sulemana, 2013; Graham et al., 2016). Thus, water management implies that as modernisation advances, more people have realised that women are not the only ones responsible for water collection but are capable of doing other productive work. This implies that Pareto and his mass-elite theory failed to stand the test of time in Tubu where gender roles have transformed with males playing leading roles in water collection. The results are similar to a study conducted

by Cole (2009) in the Kingdom of Eswatini (Formerly Swaziland) where it was found that women opt for other alternatives sources when a source provides poor quality water or is broken down. Similar to the findings by Cole (2009), the thesis findings indicate that people in Shakawe and Shorobe could not use water from certain sources because such water sources provided low-quality water in some instances. Decision-making on the water is a pervasive aspect of water management. Inadequate access to it has negative effects on health, which impact negatively on productivity and human welfare. However, the socioeconomic characteristics of households do affect the improvement of water access and it is important to identify these factors to better address the problems. This is because women are mostly burdened with household chores and as such are not active in income generation activities. This means that women in most cases rely on their husbands or males to pay for water. The findings revealed that water for domestic use was paid for by males than by women. This implies that access to water is negatively impacted if one has no money to pay such as what happens in the study area where more males were involved in activities that generate income than females. The findings revealed that the primary water collectors in the study area were generally women although males dominate women in water collection at the village level, which was a scenario observed in Tubu.

8.5 Cultural factors influencing dissonance existing between Customary and statutory water management institutions and practice

Water is imbued with symbolism that emanates from cultural particularities and it is a fundamental element in religion. Results revealed that water is important in people's everyday lives. As a social object, water's representation is embedded in the social context and constitutes a set of cognitive systems enabling the interpretation of the social and physical world. Findings revealed that people's spiritual and religious beliefs hold a deep respect for water and the culture often provides an example of a sustainable way of life. Understanding religious and non-religious beliefs regarding water is essential to effectively deal with water management issues.

Religious wisdom plays a positive role in promoting water management by linking values and behaviour that promote sustainable management. The expression ‘’[t]here is no life without water is a point that societies unanimously acknowledge across the globe. For Customary institutions and for those that have not yet lost all links with nature, water is a sacred element, inspiring myths and legends and is given a divine value. When water is conceived as sacred, it is priceless, and its value transcends the notion of commodification.

Thus, the water management framework has to be compatible with the needs of the local people. From a Customary institutions standpoint, results revealed that water is not just a mere ordinary commodity as it is perceived in statutory institutions where it is commodified and has a market value like any other goods and services. From both African Traditional Religion (ATR) and Christianity, the findings revealed that water is often used ritually in worship to baptism as well as healing. Rituals not only make use of ordinary physical materials and events, but they also utilise customs and traditions based on culture and worldviews to signify and point to spiritual realities in general to the mystery of life. Findings in the study revealed that cleansing rituals were performed in sacred water points. While findings revealed that the use of water for rituals varies, it is noteworthy that water rituals were performed on all persons who attended funerals and for women who gave birth. Results also showed that water is perceived as therapeutic and that healing entails the restoration of the imbalances in an individual sense. From Customary institutions standpoint, illness is caused by a lack of total harmony. Thus, healing has to be an integral part of experiencing this harmony. Findings in the study reveal that ancestors are a significant component of water resources governance. Communications with ancestors become possible through the performance of certain rites and rituals using water drawn from sacred places. The treatment of illness is, therefore, a deeply religious matter, especially in the rituals of water as the sources of life-giving force. Thus, in this regard, there are numerous variations

in how water is used in liturgical rituals, such as drinking, sprinkling and immersion in water (Wig and Kromrey, 2018).

8.6 Institutional related factors engendering the dissonance existing between Customary and statutory water management institutions

While in statutory institutions, water governance employs secularised economic principles to push cost recovery, the approach in Customary institutions is spiritually inclined within the purview of which non-tangible spirits are perceived as an enabler of clean water. Despite the divergent perceptions existing between Customary and statutory institutions, findings showed that more attention is given to statutory than Customary institutions. Water is essential for human life and the development of societies. Despite very low income in the study area, results revealed that willingness to pay for water services was high. People are unable to pay water charges if they are unemployed and have meagre incomes. Thus, poor services that do not reflect people's expectations, lack of financial capacities and competition for water sources are implicated in rural consumers' unwillingness to pay for water. It is noteworthy that, the willingness to pay will be positively influenced and people will be capacitated to contribute to cost recovery fees if such factors are thoroughly dealt with.

An ideal water management framework has to pay attention to the differences between Customary and statutory institutions and priorities as regards water use and the barriers encountered in the interface between the two genres of institutions. The residents' disapproval of water disconnection implies that water management should priorities the needs of hapless community members. This implies subsidising water services for poor households through steeper tariffs for luxury consumption and the corporate world. When water is regarded as a commodity, its objective is to achieve efficiency, sustainability and equitable use. This is accomplished by attaching an economic value to it but ensuring that the price is affordable. To achieve the financial sustainability of water services, user fees should meet, as a minimum, the

operational and maintenance costs. However, it noteworthy that while these arrangements may work in the developed world economies, they are inappropriate in the rural areas of developing countries where Customary institutions are dominant and where people are poor.

8.7 CONCLUSIONS

Based on the objectives outlined in chapter one, this thesis makes the following conclusions: Understanding the demographic and socio-economic variables in rural environments will facilitate smooth access to water and help to improve the interface between Customary and statutory institutions. It is also noteworthy that embracing local communities' cultural values is vital and has the potential of reducing the contradiction existing between Customary and statutory institutions. Furthermore, inadequate or lack of consultation with the rural traditional leadership and the entire stakeholders negate the efforts to achieve effective water governance as it requires the consultation and participation of all stakeholders from all sectors including Customary and statutory institutions. Globally, stakeholders are varied, and they have different Customary practices. It is noteworthy that the need to recoup water processing costs and the conception of water as a gift of nature engenders dissonance between Customary and statutory institutions. Thus, sustainable water governance and management can be achieved if and only if there is a proper hybridisation of the two genres of institutions.

8.8 POLICY RECOMMENDATIONS

From the findings, the following recommendations are suggested:

The need to incorporate the cultural dimension of water management as it obtains in the Customary institutions

Findings have shown that the rural people in the study area depend on their Customary institutions for water resources management. Results also indicate that Customary institutes are not being utilised in water management because statutory institutions downplay their role. There is evidence (reflected in Water Act (1968) and Water Policy (2012) that statutory institutions do not recognise rural people's cultural values in water management. The general belief within the

Customary institutions is that water is a gift of nature and is regarded as life. The recognition of the cultural dimension of water as it obtains in Customary institutions is, therefore, an important aspect for water management in rural areas. The findings indicate that rainmaking ceremonies, use of taboos in curbing water misuse are very widespread. The statutory institutions' control of water in the study area is not satisfactory because it precludes the utilisation of cultural norms. This means that there is a need for the Department of Water and Sanitation (DWS) together with Water Utilities Corporation (WUC) to work hand in hand with local leadership in realigning the statutory water legislations to incorporate key aspects of Customary institutions. This can be achieved by incorporating the office of the Village Chiefs into statutory organisations such as DWS and WUC to enable them to contribute to the debates on water issues during statutory meetings. The harmonisation of both Customary and statutory institutions will therefore minimise the attritions existing between the two institutions in the governance of water.

Distributive water governance needs attention in all water policy agenda

Findings revealed that there are Village Chief, Deputy Chief and Village Development Committee chairpersons who are conversant with the Customary ways of water management in Tubu, Shakawe and Shorobe. Thus, the adoption of the concept of decentralisation is important in the analysis of distributive water management in these three villages. Even though decentralisation and distributive governance are not synonymous, they both refer to the principle of subsidiarity and involve a requirement for cooperation between players at different levels of responsibility (statutory and Customary). This reference to the principle of subsidiarity signals the end of the monopoly of the statutory institutions in the management of water resources in rural areas. It implies both recognition of the rights of decentralised communities over water use in their territories, and the redistribution of management rights and powers by their transfer from statutory institutions to local leadership. Findings revealed that Customary institutions are favoured by the majority of the local people in the management of water. The principle of

subsidiarity demands the effective delegation of some of the prerogatives and roles of the statutory institutions to decentralised authorities to enhance the effectiveness of the allocation and planning for the development of water resources at a local level.

Context-specific water subsidisation and funding

Water is a basic human right which implies that it has to be free for all. However, given that there are water services charges which have to be met, water needs to be priced in such a manner that all people, including the poorest, can afford an adequate supply of safe water. What this implies is that WUC needs to engage affluent individuals and corporate bodies to fund water supply to ensure that access to it is affordable for everyone. Findings indicated that over 91% of the respondents earned less than the minimum standard income of P1500.00 per month and consume over 80 litres of water per household per day. WUC needs to ensure that those consumers who can pay should do so. To lessen the burden on affluent consumers and corporate bodies, subsidies may be reduced through the use of low-cost technologies and flexible payment terms for users; where there are insufficient resources for piped water distribution, the water right may be met through non-piped systems that are safe and in reasonable condition. Where the resources are lacking, the WUC may implement the right to water progressively, but it has to take concrete and expedited steps in this direction.

The repealing of the current Water Act, 1968 and the adoption of a new Water Act. Based on North (1990), institutions are path-dependent, which implies that they evolve by continual marginal adjustments, building upon the preceding arrangements. This study proposes that Customary institutions, as they are practised in the study area, be the logical starting point from which statutory institutions could be systematically modified and steered towards greater conformity with the principles of Customary institutions in the governance of water resources. Thus, both Customary and statutory institutions can be transformed to ensure greater sustainability in natural resources uses. What this entails is that there is a need for DWS to draft

a new Water Act, which captures key aspects of Customary institutions in rural water management. This is fundamental to the governance of water resources in rural areas and can reduce tension between Customary and statutory institutions. There is a need to also explain the legislation making proceedings to inform the rural people so that they will be able to ensure that their wishes and cultural aspects in water management are fully captured. This implies that when drafting the new national water legislation, the DWS and MLMWSS need to ensure that they involve all stakeholders including rural water users. Thus, the chiefs and other traditional leaders need to form a party of statutory institutions water governance and management body.

8.9 FUTURE RESEARCH

The study area constitutes a small fragment of the entire villages within the Okavango Delta. Besides, a sample size of 455 households was studied, which indeed reflects on the scope of the work; different indigenous communities have unique water management strategies, which are context specific. There is, therefore, a need for future research to ensure a wider coverage in terms of communities and sample size to broaden analytical perspectives on water issues in the area. Data for this study was gathered through a cross-sectional research design, which allows for the data collection on a one-off basis meant to provide a snapshot of the problem being investigated. However, this approach did not capture changes in the perceptions of people over time. This may have affected the generalizability of the data obtained in this study. Therefore, future studies need to adopt trend and ethnographic approaches (that covers a longer period) to produce a comprehensive account of the dissonance between the two categories of institutions in water governance. Furthermore, this study solicited opinions of rural folks; future research needs to assess perceptions of the urban dwellers as well. The study found that even though Botswana statutory water management institutions were outdated, evidence of water sectors reforms suggested that the government has shown commitment in reviewing the 1968 Water Act, though the speed of updating is slow. Also, future research would need to focus on

the impact of reforms on indigenes' water aspirations. The results of the study showed mixed results on the role of gender in the governance of water. While literature shows that women in rural areas are responsible for water collection and are denied decision making roles over water use, this study found that men were involved in water collection, which is a contrast to the information provided in the literature. Therefore, future studies need to engage in an in-depth examination of gender roles in water governance in the area. To broaden the scope of the study, there is a need to embark on future studies that catalogue water taboos and map the spatial distribution of sacred water points in the Okavango Delta.

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Appendixes

UNIVERSITY of BOTSWANA

Office of the Deputy Vice Chancellor (Academic Affairs)

Office of Research and Development

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Ref: UBR/RES/CHMS/006

18th January 2018

Permanent Secretary
Ministry of Land Management, Water and Sanitation Services
Private Bag 00434
Gaborone, Botswana

RE: APPLICATION FOR A RESEARCH PERMIT: REQUEST FOR EXPEDITED APPROVAL: Mr GONDO RENIKO

Since it is a requirement that everyone undertaking research in Botswana should obtain a Research Permit from the relevant arm of Government, The Office of Research and Development at the University of Botswana has been tasked with the responsibility of overseeing research at UB including facilitating the issuance of Research permits for all UB Researchers inclusive of students and staff.

I am writing this letter in support of an application for a research permit by Mr Gondo Reniko, a graduate student at the Okavango Research Institute, University of Botswana. Mr Reniko has proposed to conduct a study titled **"Dissonance in customary and statutory water management institutions in the Okavango Delta, Botswana."** The overall objective of this study is to analyse the factors engendering the dissonance existing between customary and statutory water management institutions in the Okavango Delta, Botswana. The findings of the study will inform policy makers on the role of customary institutions in water management in Botswana.

The Office of Research and Development is satisfied with the process for data collection, analysis and the intended utilization of findings from this research. We will appreciate your kind and timely consideration of this application.

We thank you for your usual cooperation and assistance

Sincerely,

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Republic of Botswana

MINSTRY OF LAND HOUSING
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CMLWS 1/ 17 /4 II (14)

24 January 2018

MINISTRY OF LAND MANAGEMENT
WATER & SANITATION SERVICES
24 JAN 2018
PRIVATE BAG 00434
GABORONE
PERMANENT SECRETARY

Okavango Research Institute
University of Botswana
Private Bag 285
Maun

(Attention: Mr Reniko)

RE: APPLICATION FOR RESEARCH PERMIT BY MR GONDO RENIKO TITLED DISSONANCE IN CUSTOMARY AND STATUTORY WATER MANAGEMENT INSTITUTIONS IN THE OKAVANGO DELTA, BOTSWANA.

The above subject matter refers.

- Permission is being granted to conduct research titled "DISSONANCE IN CUSTOMARY AND STATUTORY WATER MANAGEMENT INSTITUTIONS IN THE OKAVANGO DELTA, BOTSWANA"
- We trust the research programme will be conducted in accordance with local and international ethical norms and as per research guidelines of July 2004 issued by the Office of the President attached herewith.
- We request an oral presentation on the findings to the Senior Management and the final copy to be submitted to the ministry.
- The focal person for the ministry is head of research Mr. Khawulani Ace Bachobeli
- The following personnel will be involved in the research:

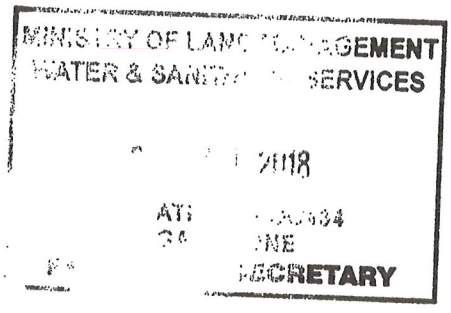
  i. Mr Gondo Reniko (Principal Investigator)
  ii. Prof. O. D. Kolawole (Supervisor)
  iii. Prof: J.E. Mbaiwa (Supervisor)
  iv. Dr. M. Motsholapheko (Supervisor)

Any changes on the research personnel should be communicated to this ministry.

- The research will be undertaken in the following areas:

  i. SHAKAWE
  ii. TUBU
  iii. SHOROBE

The project should run for a period of **One Year (1)**, commencing on **1 February 2018 to 1 February 2019.**



Yours faithfully

Khawulani Ace Bachobeli
For/Permanent Secretary

APPENDIX 3

SCHEDULE NO.....

INTERVIEW SCHEDULE FOR HEADS OF HOUSEHOLDS

My name is ……., from the University of Botswana. I am conducting research titled: **Dissonance in Customary and statutory Water Management institutions in the Okavango Delta, Botswana**. I would be very grateful if you could answer a few questions regarding water institutions in the Okavango Delta. Should you feel uncomfortable at any point during the process of answering these questions, you are free to either stop or decline to answer. All the information given will be treated with confidentiality and will only be used to generate data for this research only.(*Leina lame ke Gondo Reniko. Moithuti wa dithuto tsa PhD go tswa University of Botswana. Ke dira ditshekatsheko tse di itebagantseng le: Kgotlhakgotlhano ya tsamaiso ya ngwao selegae le molao wa makalana a lebaganeng le tlhokomelo le tsamaiso ya tiriso ya metsi mo makgobokgobong a Okavango. Fa o sa tseege sentle fa ntse puisanyo e tsweletse o gololesegile go ka emisa kana go sa arabe. Puisanyo ee e sireletsegile e fa gare ga gago le modira dipatlisiso fela.)*

Residence:

Village[Motse]……

Date[*Letsats*i]……..……Time[*Nako*]…….....

SECTION A: DEMOGRAPHIC/SOCIO–ECONOMIC FACTORS

SN	SCHEDULE & VARIABLE	OPTION	RESPONSE	
(i)	**GENDER and ETHNICITY**			
A1	What is your gender?[*Bong*]	Male (rra)	1	
		Female (mma)	2	

A2	What is your ethnicity? [*o wa morafe ofe?]*	BaSarwa	1	
		BaTawana	2	
		BaYeyi	3	
		BaHerero	4	
		HamBukushu	5	
		Other (Please specify) …….....		
(ii) **RELIGION**				
A3	What is your religion**? [***O wa tumelo efe***?]**	African Traditional Religion (ATR) [*Ya setso*]	1	
		Christianity[*Seker esete*	2	
		Islam [*Isilamo*]]	3	
		Others [*enngwe e tlhalose*]	4	
(iii) **AGE**				
A4	How old are you?[*Dingwaga dikae?]*		……	
A5	**Age Group** 20-29		1	
	30-39		2	
	40-49		3	
	50-59		4	
	60+		5	
(iv) **EDUCATION**				
A6	Did you have any formal education?[*O tsenye sekole?]*	Yes	1	
		No	2	
		None[*Ga kea*	1	

A7	If 'yes' to A6, what is your highest qualification? [*Fa o rile ee mo go A6,O tsenye sekole go ema fakae*?]	*tsena*]		
		Primary[Primary]	2	
		Secondary	3	
		Tertiary[*Dikole tsa ithutelo tiro*]	4	
(vi)	**EMPLOYMENT AND INCOME[Pereko le Kamogelo]**			
A8	Are you employed? [*O a bereka*]	Yes [*Ee*]	1	
		No [*Nnyaa*]	2	
A9	If '***yes'*** to A8, whom do you work for?[*Fa o rile Ee ko go* (A8) *o bereka mo go eng*	Government[*Gor omente]*	1	
		Private sector [*lekalana le le ikemetseng*]	2	
		Self-employed [*Ke a ipereka]*	3	
		Others	4	
A10	If self-employed, what exactly do you do?[*Ha o ipereka, o dira ole mo go eng*?]	Farming[*Molemi morui*	1	
		Small-scale entrepreneurship[*Mogwebi yo mmotlana*]	2	
		Others [*Tse dingwe*] 3…….		

A11	What is your income per month?[*O amogela/bona bokae mo kgweding*]	P…….

A12	**INCOME GROUP**		
	Less than P1500	1	
	P1500-P2000	2	
	P2500-P3000	3	

	P3500-P4000	4	
	P4500-P5000	5	
	P5500 above	6	

(vii) **HOUSEHOLD**

A13	Are you the head of the household?[*A o tlhogo ya lelwapa*]	Yes	1	
		No	2	
A14	**Household size**: How many are you in your household?[*lonna lole kae mo lwapeng*]	……..		

SECTION B: CULTURAL FACTORS INFLUENCING WATER MANAGEMENT PRACTICES [*TSA NGWAO TSE DI AMANG TSAMAISO YA METSI*]

Respond to the following statements (**B1-B21**) by indicating whether you strongly disagree (**SD**), disagree (**D**), undecided (**U**), agree (**A**) or strongly agree (**SA)**

Tsibogela tse di latelang (b1-b2)ka go supa fa o dumalana thata(SD) o dumalana(A) o le fa gare(U) o sa dumalane(D), o sa dumalane gotlhelele(SD)

B1	Both men and women are responsible for fetching water for domestic use in a household. [*Botlhe borre le bo Mme ba atle ba gelele metsi go dirisiwa mo lwapeng*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B2	There are sacred water points in this village[*Gona le metswedi ya metsi e e haphegileng mo motsing*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B3	Certain containers are not allowed to draw water from a well. [*Gona le dingwe tse di sa letlelelweng go gelelela metsi]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B4	There are specific religions in this community which regards certain	SD	1	
		D	2	

	water sources as sacred.[*Gona le ditumelo mo motsing tse tsayang metswedi mengwe mo motsing ele mahelo a a itshephileng*]	U	3	
		A	4	
		SA	5	
B5	There are local rules (taboos) relating to water abstraction and use from a water source in this village.[*Gona le meila ya selegae e e amanang le kgelelo le tiriso ya metsi go tswa mo Metsweding ya metsi mo motsing oo?]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B6	Local water rules/taboos are set and enforced by chiefs [*Meila le melawana ya metsi e bewa e bile e gagamadiwa ke Dikgosi*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B7	There are sanctions for failure to comply with the local rules/taboos of water.[*Gona le ditlamorago tsa go tlhoka go obamela melawana/meila ya metsi*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B8	I came to know about the local rules/taboos for water use in through folktales from elders.[*ke itsile ka melawana/meila ya tiriso ya metsi ka mainane a ke a tlhabetsweng ke bagolo*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B9	There are *spiritual beings* which live in sacred water sources.[*Go dilo dingwe tsa tlholego tse dinnang mo Metsweding ya metsi e e haphegileng]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B10	Snakes, frogs and crocodiles are the common creatures associated with local water rules/taboos.[*Dinoga, digogwane le dikwena ke tse di tlwaelesegileng go amnngwa le tse dinnang mo Metsweding e e haphegileng tse di amanngwang le meila kgotsa melawana*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	

B11	If one kills a frog in a sacred water source the source dries up.[*Fa mongwe ka bolaya segogwane se sennang mo motsweding o o haphegileng motswedi wa teng o a kgala]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B12	Local water rules were meant to monitor and control water pollution.[*Melawana ya mo gae ya tsamaiso ya metsi e diretswe go laola tiriso ya metsi*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B13	Besides using water for domestic purposes, we also use it for religious devotions e.g. to cleanse evil spirits.[*Kontleng ga ditiro tsa selegae, metsi a dirisiwa gape mo go tsa tumelo, jaaka bo go tlhapa dibati*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B14	There are proverbs which talk about water related issues in our culture.[*Gona le diane tse di amanang le metsi mo ngwaong?]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B15	People in this village see water as having a religious/cultural value.[*Batho mo motsing o ba bona metsi ana le boleng mo go tsa tumelo/ngwao*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B16	Village chiefs and elders are responsible for implementing local water rules /taboos [*Dikgosi le bagolo mo motsing ke bone ba ba tlhomamisang gore melao le meila e salwa morago?]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
		SD	1	

B17	Traditional leaders (Chiefs & elders) have an important role to play in water conservation.[B*oeteledipele, eleng Borara le Dikgosi bana le seabe se se botlhokwa mo tshomarelong ya metsi?]*	D	2	
		U	3	
		A	4	
		SA	5	
B18	In Tswana culture, there are renowned water diviners who are very efficient in ground water exploration.[*Mo ngwaong ya Setswana, gona le badupi ba metsi ba ba tumileng b aba tshephagalang mo go batleng metsi ka fa tlase ga lefatshe]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B19	For underground water exploration, water diviners use a dowsing rod which is made from a simple and locally available material and hence no cost involved in water diving.[*Mo go batleng metsi a a ka fa tlase ga lefatshe, badupi ba metsi ba dirisa thupa/kala ya setlhare se se fitlhelwang mo kgaolong*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B20	In traditional Tswana culture, there is no need for sophisticated equipment for spotting underground water as water diviners use locally available simple tools. [*Mo ngwaong ya Setswana, ga go tlhokafale ditshipi tse di mahatlhatlha tse di turang go dupa metsi ka fa tlase ga lefatshe ka gore Badupi ba dirisa tse di teng tsa tlholego*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
B21	Once water diviner locate underground water, the intention is to dig a well on the spot.[*Fa Modupi a sena go bona metsi sediba sea epiwa gone foo*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	

SECTION C: INSTITUTIONAL FACTORS FOR WATER MANAGEMENT.

(i) Water Accessibility

C1	Where do you get water for domestic use in this	Tap[*Pompo*]	**1**	

	village?[*Lo gelela metsi kae a lo a dirisang mo motsing?*]	Well[*Sediba*]	**2**	
		River[*Noka/molapo*]	**3**	
C2	How reliable is your water source in terms of time period over which water is available? [*Motswedi wa lona wa metsi o ikanyega gole kae fa re labile nako e metsi a e tsayang ale teng*]	1 week (*beke e nngwe)*	**1**	
		2 weeks (beke tse pedi)	**2**	
		1 month (kgwedi e nngwe)	**3**	
		All year round	**4**	
	Others (please write)…… …… …… **.....**			
C3	What is the average distance of water source from your house?[*Motswedi/ko lo gelelang metsi teng go bokgakala bokae gotswa mo motsing wa lona*]	Less than 1km	**1**	
		2-3 km	**2**	
		4-5 km	**3**	
		Over 6 km	**4**	
C4	How long does it take you to get to the water source? [*Go gotsaya lobaka lo lo kae go tsena ko motsweding/go gelelwang metsi teng*]	Less than 30 minutes	**1**	
		Less than 1 hour	**3**	
		More than 1 hour	**2**	
		Over 2 hours	**4**	
C5	If your answer to 'C1' is tap (*Pompo*), who owns it?[*Fa karabo ya gago ko C! ele Pompo, key a ga mang?]*	WUC	**1**	
		DWA	**2**	
		Village Committee	**3**	
		Other (specify) 4 ……		
C6	If your answer to '**C1'** is a well *[Sediba*], who owns it? [*Fa karabo ya gago ko 'C' ele Sediba, key a ga mang?]*	WUC	**1**	
		DWA	**2**	
		Village Committee	**3**	

C7	What is the average consumption of water per day for your household? (State number of containers)[*Lo dirisa selekanyo se se kae sa metsi mo letsatsing(tlhalosa palo ya dikupu)]*	……..		
C8	Do you share your water source with other villages?[*A lo kopanetse fa go gelellwang teng/motswedi wa metsi le motse o mongwe?]*	Yes	**1**	
		No	**2**	
C9	If your answer is 'yes' to C8, are there problems you encounter in sharing that source of water?[*Fa karabo ya gago ele 'Ee' ko C8, a lo kopana le dikgwetlho/mathata mo go diriseng motswedi mmogo?]*	Yes	**1**	
		No	**2**	
C10	If 'yes' to C9, what are some of the problems?[*Fa o rile 'Ee' ko C9 ke mathata afe kgotsa dikgwetlho dife?*] …… …… **.....**			
C11	If 'yes' to C9, are these problems solved locally?[*Fa o rile 'Ee' ko C9, a ke mathata a rarabololwang hela mo gae?]*	Yes	1	
		No	2	
C12	If the problems are solved locally who is responsible for solving water related problems locally?[*Fa dikhotlhang/mathata a rarabololwa mo gae, ke bo mang kana mang yo o itebagantseng le go a rarabolola?]*	Village chiefs	1	
		Village elders	2	
		DWA	3	
		WUC	4	
C13	Do you need permission to access water from the source?[*A o tlhokana le tetla/teseletso go gelela metsi*?]	Yes	1	
		No	2	
C14	If 'yes' to **C13,** whose permission must be sort?[*Fa o rile 'Ee' ko C3, go kopiwa tetlelelo ko go mang?]*	WUC	1	
		DWA	2	
		Chiefs	3	

		Spirit mediums	4	
C15	The general maintenance of local wells is the responsibility of every community member.[*Tlhokomelo le paakanyo ya sediba/motswedi ke boikarabelo jwa mongwe le mongwe mo motsing*]	Yes	1	
		No	2	
C16	Failure to comply with the maintenance of a community well attracts a fine payable to the village chief.[*Go tlhoka go baakanya sediba gona le tuelo ya gone e e duelelwang ko kgosing*]	Yes	1	
		No	2	

(ii) Water Pricing and Provision of Physical Infrastructure

C17	Do you receive purified water in this village?[*A gona le metsi a tlhatlhobetsweng go nowa mo motsing*?]	Yes	1	
		No	2	
C18	If '*YES*' to C17, is the water delivered in pipes?[*Fa o rile 'ee' ko C17 a atla ka dipompo]*	Yes	1	
		No	2	
C19	If 'YES' to C18, is the water pumped directly into your house? *[Fa o rile 'ee' ko C16 a pompo e tsena mo ntlung?]*	Yes	1	
		No	2	
C20	If 'NO' to C19, where do you get water from?[*Fa o rile Nyaa ko C17, o gelela metsi kae?]*	River	1	
		Well	2	
		Stand pipe	3	
		Others(Please specify)	4	
C21	If water is delivered in pipes who installed the pipes?[*Fa o gelela metsi mo pompon mo lwapeng e tsentse ke mang*?]	DWA	1	
		WUC	3	
		NGO	5	
		Others (Please Specify)……....		
C22	Are you expected to pay for the use of purified water? [*A go solohelwa gore o duelele tiriso ya metsi*]	Yes	1	
		No	2	
C23	If 'YES' to C22, how much does your household pay per month?[*Fa o rile 'ee' ko C22, lo duela bokae mo kgweding?]*	P……		

C24	To whom do you pay for water?[*Lo duela kae kana ko go mang?]*	Village chief	1	
		WUC	2	
		DWA	3	
		Others (Please Specify) 4 ……		
C25	Do you think the amount is affordable?[*A lo duela madi a a siameng?]*	Yes	1	
		No	2	
C26	If '**NO**' to C25, what should be done? [*Fa o rile 'Nnyaa' ko c25, go dirwe eng?]*	We need free water[*Re batla metsi a mahala]*	1	
		Government must pay in full	2	
		Government must subsidise domestic water to be affordable	3	
		Others (Pleases specify …… ……		
C27	Who pays for the water you use in your household?[*Lo duelelwa kemang metsi a loa dirisang mo lwapeng?]*	Government	1	
		Self	2	
		Others (Please specify 4 …… ……		
C28	What happens if you do not have money to pay water bill?[*Go diragalang fa lo sena madi a go duela metsi*]	Go for river water	1	
		Borrow money to pay	2	
		Will be disconnected	3	
		Get water from neighbour	4	
C29	Are you willing to pay for water you use for domestic purposes [*O eletsa/wa rata go duelela metsi a loa dirisang molwapeng?]*	Yes	1	
		No	2	

(i) **Government Policy on water**				
C30	Are you aware that Botswana has a Water Act (1968) [*A o a itse gore Botswana o na molao tsamaiso ya metsi wa 1968*]	Yes	1	
		No	2	
C31	If 'yes' to C28 do you know some of the provisions of this Act?[*Fa o rile 'ee' ko C28 o itse dintlha dingwe tsa one?]*	Yes	1	
		No	2	
C32	The Water Policy (2012) emphasises that water has an economic value which must be recognised and reflected in its cost to users. Are you aware of this? [*Molao wa metsi (2012) o gatelela gore metsi ana le boleng mo itsholelong jo bo tshwanetseng go akarediwa fa go bewa ditlhotlhwa, a o tlhaloganya seo?*]	Yes	1	
		No	2	
C33	The Water Act (1968) articulates that people have to obtain a water permit before accessing water for other purposes besides domestic uses. Are you aware of this?[*Tsamaiso ya metsi (1968) e gatelela gore batho ba tshwanetse go kopa teltelelo pele ga baka dirisa metsi, a o itse seo*?]	Yes	1	
		No	2	
C34	If 'yes' to C33, have you at one point applied for a water permit?[*Fa o rile 'ee' ko C33, a okile wa kopa tetlelelo ya go sika kana go epa sediba nako nngwe*?]	Yes	1	
		No	3	
C35	If 'yes' to C34, were you given the permit?[*Fa o rile 'ee' ko C34, a one wa fiwa tetlelelo?]*	Yes	1	
		No	2	
C36	If 'yes' to C35, did you pay for water permit?[*Fa o rile 'Ee' ko C35, a one wa duelela teseletso ya teng?]*	Yes	1	
		No	2	
C37	If 'yes' to C36, how much did you pay?[*Fa o rile 'Ee' ko C36, o duetse bokae?]*	P……..		
C38	For polluting water the Water Act (1968) stipulates	Yes	1	

	that one pays P1000. Are You aware of this? [*Go kgotlhela metsi Molao wa metsi (1968) o tlhalosa gore modira molato o duela P1000]*	No	2	
C39	If 'yes' to C38, is this punitive enough?[*Fa o rile 'Ee' ko C38, a go lekane?]*	Yes	1	
		No	2	
C40 What are your views on paying for water permit?[*Mogopolo wa gago ke ofe mabapi le go duelela teseletso?*] ……				

SECTION D: PERCEPTIONS ON CUSTOMARY AND STATUTORY WATER MANAGEMENT. [PATLO *MAIKUTLO MOM ALONG WA SELGAE LE WA PUSO WA TLHOKOMELO YA METSI]*

Respond to the following statements (**D1-D35**) by indicating whether you strongly disagree (SD), disagree (D), undecided (U), agree (A) or strongly agree (SA)[*Supa maikutlo a gago mo go tse di latelang, ka go supa fa o Sadumalana thata, O sadumalane, o le fagare, O dumalana kana O sa dumalane gotlhelele.]*

SN	ITEM			
D1	It is a Tswana culture that when drought persists for too long or when rains delay beyond the usually expected season, traditional rain making ceremonies are conducted and the congregation members chant '*Pula! Pula! Pula!*' while looking to the heavens. [*Ke ngwao ya Setswana gore fa pula e tsaa nako e telele e sane, go bo go tshwarwa meltlo ya go rapelela kana go nesa pula]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D2	In the Tswana culture the belief is that some people are Rainmakers. [*Gona le tumelo mo ngwaong ya Setswana gore gona le ba baitseng go nesa pula*.]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D3	Cultural beliefs and taboos are crucial in water management in this village. [*Tumelo tsa ngwao le meila di botlhokwa thata mo tsamaisong ya tiriso ya metsi mo motsing o.]*	SD	1	
		D	2	
		U	3	
		A	4	

		SA	5	
D4	Cultural values have no role in water management.[*Ngwao gaena seabe mo tsamaisong ya tiriso ya metsi]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D5	Water is *God-given* and therefore people must get it free of charge.[*Metsi ke mpho ya modimo jalo he batho ba tshwanetse go a bona mahala]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D6	Water has an *economic value* and so people have to pay to access it. [*Metsi a na le boleng mo itsholelong jalo a tshwanetse go duelelwa go dirisiwa]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D7	Spirit mediums play a crucial role in water management.[*Ditumelo dina le seabe se se tona thata mo tsamaisong ya tiriso ya metsi.]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D8	We need to revive rain making ceremonies in our village so as to boost the amount of rain we receive.[*Re tlhokana le go tsosolosa meletlo le dithapelo tsa go nesa pula go oketsa pula e re bonang]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D9	Cultural water taboos are very crucial for water quality management [*Meila ya ngwao e e lebaganeng le metsi e thusa thata mo tsamaisong ya tiriso le tlhokomelo ya metsi*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
		SD	1	

D10	With climate change spirit mediums have no role to play in water management. [*Mo dinakong tse tsa phetogo ya loapi ditumelo ga dina seabe se sekalo mo tsamaisong le tiriso ya metsi*]	D	2	
		U	3	
		A	4	
		SA	5	
D11	A mix of cultural and modern water quality management practices are very crucial for water management in light of climate change in this village.[*Go kopanya ngwao le tsa sesha/maranyane mo go tlhokomeleng tiriso le tsamaiso ya metsi go botlhokwa fa re labile phetogo ya loapi*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D12	If we observe traditional local water rules (taboos) and often hold rainmaking ceremonies we can reverse the negative impact of climate change.[*Fa re sala ngwao morago ebile re tshwara meletlo/dithapelo tsa pula re ka busetsa seemo se sa phetogo ya loapi ko morago*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D13	People who fail to pay for water must be disconnected from water supply.[*Batho ba ba palelwang ke go duela metsi ba tshwanetse go kgaolelwa metsi*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D14	Government should be responsible for water bills incurred for domestic use in individual households. [*Goromente o tshwanetse go duelela batho metsi a ba a dirisang mo go tsa lelwapa mo malwapeng a bone*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D15	Government should allow people to use as much water as they need.[*Goromente o tshwanetse go letlelela batho go dirisa metsi fela jaaka ba batla*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D16	Government should place restrictions on how much water people use. [*Goromente o tshwanetse go laola bokete jo batho ba dirisang metsi ka*	SD	1	
		D	2	
		U	3	

	jone]	A	4	
		SA	5	
D17	Restrictions on water use need to come from local leadership (e.g. Chief).[*Taolo ya tiriso ya metsi e tshwanetse go laolwa ke bogogi mo motsing(jaaka dikgosi*)]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D18	If our village has water shortage problem, mandatory rationing must be enforced by chiefs not by WUC.[*Fa motse wa rona ona le tlhaelo ya metsi, kabakanyo/seelo sa tiriso ya metsi se tshwanetse go laolwa ke dikgosi eseng Kompony ya Metsi]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D19	I believe that overuse of water depletes water available to others. *[ke dumela gore tiriso phetelela go sena tlhoko go hetsa metsi a akabong ane a dirisiwa ke babangwe]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D20	I have a personal responsibility to conserve water.[*Kena le boikarabelo jwa go somarela metsi]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D21	I believe local leadership must be empowered to assist in informing people to conserve water.[*Ke dumela gore bogogi mo motsing bo tswanetse go fiwa dithata tsa go thusa batho mo tshomarelong ya tiriso ya metsi]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D22	Young people should be taught to use traditional methods for water conservation.[*Batho ba ba botlana ba tshwanetse go rutwa mekgwa ya tlholego ya tshomarelo ya metsi*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
		SD	1	

D23	Christianity and other religions undermine African Traditional Religion methods of water conservation. [*Sekeresete le ditumelo tse dingwe di nyenyafatsa tumelo ya setso/ngwao mo tshomarelong ya metsi*]	D	2	
		U	3	
		A	4	
		SA	5	
D24	Government must make it mandatory that cultural and modern methods of water conservation be used especially in rural areas.[*Goromente o tshwanetse go tlhomamisa gore ngwao le tsa sesha/maranyane tsa tshomarelo ya metsi dia dirisiwa bogolo jang thata mo magaeng kana mo dikgaolong]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D25	People in this village know about the government water law.[*Batho mo motsing oo ba itse ka molao wag a goromente wa metsi]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D26	Customary water rules must apply to rural people only. *[Molao wa Setswana wa tsamaiso ya metsi o tshwanetse go am aba selegae hela kana bam o gae]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D27	Government water laws need to be explained to the people in this village.*[Melao ya ga goromente ya tiriso ya metsi e tshwanetse go tlhalosediwa batho mo motsing oo]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D28	Customary laws are well understood in water management than statutory water law because the language used is local.[*Melao ya selegae e a tlhaloganyesega mo tsamaisong ya metsi gona le molao wa puso kagore o dirisa puo e e buiwang mo gae]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D29	It is wise for offenders of water law to be tried at the Kgotla.[Go a amogelesega gore ba dira molato ba lebisiwe/sekisiwe mo kgotleng ya motse]	SD	1	
		D	2	
		U	3	

		A	4	
		SA	5	
D30	Customary rules for water management are very effective because they are realistic to us in the villages.[*Melao ya selegae ya tlhokomelo le tsamaiso ya metsi e ena le maduo kagore e a tlhaloganyesega mo motsing]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D31	Traditional leaders (e.g. Chiefs and elders) are respected much more than WUC and DWA officials so they need to resolve water related conflicts in this village.[*Boeteledi pele mo motsing ba tlotliwa thata gona le ba WUC le DWA ka jalo ba tshwanetse go rarabolola tlhokakutlisisanyo mo motsing*]	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	
D32	A village water committee must consist of 50% men and 50% women. *[Komiti ya Motse ya metsi e tshwanetse gonna le maloko a bomme a a lekanang le a bo mme]*	SD	1	
		D	2	
		U	3	
		A	4	
		SA	5	

THANK YOU/KE A LEBOGA/NDATENDA

APPENDIX 4

DISSONANCE IN CUSTOMARY AND STATUTORY WATER MANAGEMENT INSTITUTIONS IN THE OKAVANGO DELTA, BOTSWANA

INTERVIEW GUIDE KGOSI/VDCs

My name is Gondo Reniko. I am a PhD candidate at University of Botswana. I am kindly inviting you to participate in this study entitled, "Dissonance in customary and statutory water management institutions in the Okavango Delta, Botswana", which seeks to develop and propose a sustainable institutional framework that will allow for the coexistence of both tourism and agriculture in Botswana. The information obtained from this interview will be used purely for academic purposes and possibly as input to government policy. Your responses will not be used for any research other than the one indicated. Your participation in this survey is voluntary. You do not have to answer questions that you do not want to answer. You may end the interview at any time you want to. However, your honest answers to these questions will help us better understand what people think, say and do about the subject matter, which would help us draw well informed conclusions.

The proceedings of this interview will be recorded with your approval.

(1) What water problems do you encounter in this village (***Probe on causes and possible solutions in line with culture?***)

(2) What is the role of Kgosi in water supply in this village? (***Probe on cultural issues now or in the past***)

(3) When people have some misunderstandings in water use do they come to you for arbitration? (Probe)

(4) Tell us what you know on rainmaking in the ancient days in this village (Botswana) (Probe)

(5) Water taboos serve as prohibitions that are enforced by social customs rather than by government official regulations. Which water taboos were observed *now/long back* in this village? (Probe)

(6) Do you think taboos are important these days? (Probe)

(7) Do you remember (any) proverb (s) which talk(s) about water? (**Probe on other adages**).

SECTION B: ROLES OF TRADITIONAL AND STATUTORY INSTITUTIONS

(a) Identify any traditional water management institutions in this village. (*Practices that you carry out without interference from the government*)

(b) What is/was the traditional institutional set-up?

(c) Were/are these practices effective in water provision?

(d) Can you identify statutory institutions involved in water management in this village?

(e) What role was/is played by these traditional and modern institutions in water management?

(i) *The Chiefs*
(ii) The village development leaders
(iii) Spirit mediums
(v) Rainmakers/Water diviners
(iv) Water Utilities Corporation
(v) Department of Water affairs
(vi) Ministry of Land Management, Water and Sanitation Services

(f) Were/are there any contradictions in their roles? (Explain your answer) How were/are these contradictions managed

SECTION C: CUSTOMARY AND STATUTORY WATER MANAGEMENT INSTITUTIONS

(a) Does culture have a role in water management? (*Explain your answer*)

(b) Traditionally who make water rules in this village?

(c) Can you name and explain some of the cultural water practices in this village

(d) What is your opinion in paying for water for domestic use?

(e) Which animals are/were associated with water conservation culturally?

(f) Which statutory institutions are responsible for water conservation in Botswana?

(g) Do you think these institutions recognise cultural values of water use?

(h) Water has an *economic value* and people have to pay to access it: What's your opinion on this?

(i) Water is *God-given* and must be free to everyone: What's your opinion on this?

(j) From your own opinion what must be down to avoid contradictions between customary and statutory water institutions?

(k) Is it possible for both rural and urban dwellers to receive water free of charge?

(l) Does one's religion affect one's belief in water management? Explain your answer?

SECTION D: PERCEPTIONS ON WATER MANAGEMENT USING CUSTOMARY AND STATUTORY INSTITUTIONS

(a) Taboos and rituals play an important role in water management in Okavango Delta. What is your opinion on this view?

(b) Christianity has a high impact on erosion of cultural practices in water management in the Okavango Delta: What's your view on that?

(c) Taboos and norms and beliefs are crucial in water management in the Okavango Delta. What's your opinion on that?

(d) Rain-making ceremonies need to be revived to increase water supply in the Okavango Delta. Comment on this.

(e) Chiefs, community leaders and village elders are crucial stakeholders in water conservation in the Okavango Delta. What's your view on that?

(f) Globalisation/colonialism has a negative effect on cultural water conservation practices in the Okavango Delta. What's your take on that?

(g) Water Act (1968), Water Policy (2012) and Water Bill (2005) are not familiar to most people in the Okavango Delta. What's your take on this?

(h) Both cultural and modern values in water management need to be used. What's your view on this?

APPENDIX 5

DISSONANCE IN CUSTOMARY AND STATUTORY WATER MANAGEMENT INSTITUTIONS IN THE OKAVANGO DELTA, BOTSWANA

WATER UTILITIES COOPERATION AND DEPARTMENT OF WATER AFFAIRS

My name is Gondo Reniko. I am a PhD candidate at University of Botswana. I am kindly inviting you to participate in this study entitled, "Dissonance in customary and statutory water management institutions in the Okavango Delta, Botswana", which seeks to develop and propose a sustainable institutional framework that will allow for the coexistence of both tourism and agriculture in Botswana. The information obtained from this interview will be used purely for academic purposes and possibly as input to government policy. Your responses will not be used for any research other than the one indicated. Your participation in this survey is voluntary. You do not have to answer questions that you do not want to answer. You may end the interview at any time you want to. However, your honest answers to these questions will help us better understand what people think, say and do about the subject matter, which would help us draw well informed conclusions.

The proceedings of this interview will be recorded with your approval.

Date: .....

Organisation.....

Position of the key informant.....

(a) CULTURAL ISSUES

1. What challenges do you encounter in your endeavour to supply water to residents? (***Probe on causes and solutions***)
2. With regard to water resources, the Government of Botswana has promulgated the Water Act (1968) and Policy (2012). In your view do these legislations promote cultural water management strategies? (Probe)
3. What *local rules* do we have for water use in this village? (**list**)
4. Taboos are informal institutions which serve as prohibitions that are enforced by social customs rather than by government official regulations. As an organisation do you observe taboos in water use? (Probe).

5. What are the possibilities of inclusion of customary practices in statutory water management institutions (Water Act, Water Policy? (Probe).
6. Household heads indicated that sometimes they spend days without water at the taps/stand pipes. May you comment on this (Probe)
7. In some cases water from the tap is black/brown in colour can you elaborate on this? (Probe)

(b) WATER ACCESSIBILITY

- Where do residents of this village get water from? (*Sources of water for both drinking or for watering animals*)
- How far are water points from households?
- Who is in charge of such water sources?
- Do these sources have rules for accessing water? (Which, why)
- What do you do for those who fail to abide by these rules?
- Do you have a water committee in this village?
- What is the role of the water committee?
- Do households pay for water they use for domestic use? How much? How often? (Give estimates)
- Are there problems you encounter in collecting the money?
- What do you think are the causes of none payment of water bills by households?
- In the event that a resident fails to pay water bills do you accept if he pays with a chicken, goat, or cow? (Why)?
- In the event that a resident fails to pay for water what do you do? (**Probe on Disconnection)**

(c) GENDER ISSUES

- Are people allowed to drill boreholes or sink wells at their homesteads? (Why)
- Are both men /women permitted to own a borehole or wells? (explain)
- Do you have any cultural norms which segregate women and men in allocation of water?
- Are women allowed to make decision for water allocation and use?
- Who is responsible for fetching water between men and women? (Why? What does our culture say? /Why?

(c) GOVERNMENT WATER LAW AND POLICY

(1) Water Act (1968) , Chapter 34:01

- We are in 2018 why do we still use this Act?
- The Act talks of a *WATER RIGHT*. Water right in water law refers to the right of a user to use water from a water source, e.g., a river, stream, pond or source of groundwater. Do you request users to obtain a water right before use? How? What are the Procedures?
- If one decides to draw water from say a river to irrigate crops what does this Act say with regard to that? (**Probe on water permit to do that? Is a permit required? Do one pay to get a permit/ if so how much?**
- Integrated Water resources Management (IWRM) requires that you involve all stakeholders in decision making. Do you recognise the role of Rain Makers? (***Now or in the past***). Why?

THANK YOU

APPENDIX 6

Dissonance in customary and statutory water management institutions in the Okavango Delta, Botswana

Focus Group Discussion Guide

My name is Gondo Reniko. I am a PhD candidate at University of Botswana. I am kindly inviting you to participate in this study entitled, "**Dissonance in customary and statutory water management institutions in the Okavango Delta, Botswana",** which seeks to analyse the factors engendering the dissonance existing between customary and statutory water management institutions in the Okavango Delta, Botswana. The information obtained from this interview will be used purely for academic purposes and possibly as input to government policy. Your responses will not be used for any research other than the one indicated. Your participation in this survey is voluntary. You do not have to answer questions that you do not want to answer. You may end the interview at any time you want to. However, your honest answers to these questions will help us better understand what people think, say and do about the subject matter, which would help us draw well informed conclusions. The proceedings of this interview will be recorded with your approval.

1. **Date:** .....

2. **Name of Village**.....

3. Group Composition

Gender	**Number of Paticipants**	
Male		
Female		
Total		

(a) Cultural issues

(1) In Botswana when there are prominent national celebrations or key national gatherings to be addressed by the highest official like the President, the slogan '*Pula*' is repeated. What is the significance of this in the Tswana Culture?

(2) In your opinion, do the above mentioned cultural activity conflict with the modern water management in the Okavango Delta?

(3) In the Tswana culture when a prominent visitor is received, the guest is accorded a special welcome with respect to rain. The expression in Setswana thus goes, '*Goroga kaPula'* what is the cultural meaning of this?

(4) In Tswana culture when drought persists for too long or when rains delay beyond the usually expected season. Traditional ceremonies were conducted and the congregation members chant '*Pula! Pula! Pula!*' while looking to the heavens. Is this still being practised in rural areas like the Okavango Delta? (**Probe**)

(5) In the Tswana culture the belief is that some people are rainmakers. (**Probe**)

(6) Do the Department of Water Affairs and Water Utilities Corporation recognise the role of rainmakers? (**Probe**)

(7) At Tsodilo Hills there is a popular sacred water spring where people collect water and use it for ritual cleansing by drinking, sprinkling it on their bodies and in protection of properties (Segadika, 2006). Does water really cure diseases and cast out evil spirits? (**Probe**).

PERCEPTIONS ON WATER AS A SOCIAL OR ECONOMIC GOOD

1. Water is a *God-given* commodity and people should not pay for it? (**Probe**)
2. Water has an economic value and people have to pay for it? (**Probe**).

UNIVERSITY OF BOTSWANA
SCHOOL OF GRADUATE STUDIES

SUBMISSION OF: **Dissertation** **Thesis** **Research Essay**

☐ **Other (please** ☐ **Specify)** ☐

PART A (to be completed ☐ **by the student)**

Name: (please print): **GONDO** **RENIKO**
Surname *First Name*

ID Number: **201602578**: Year enrolled in the present course: ***2016***

Department/Programme: ***Okavango Research Institute*:** Degree Expected: ***PhD in Natural Resources Management***

Title of Dissertation/Thesis/Research Essay/Other:

Dissonance in customary and statutory water management institutions in the Okavango Delta, Botswana

During this research project human subjects were used: Yes No

Research Permit Number: ***CMLWS1/17/4 II (14)*** Date of Issue: ***24/01/2018***
I wish to submit the above-named research project for ☐ examination ☐

Signature: _____ Date: _____

PART B (to be completed by the Supervisor)

The above-named research project is ready for examination
OR
The above-named student wishes to have his/her research project examined even though I believe it requires further attention before being examined.

☐ I am forwarding to you three loosely bound copies, as required.

☐ I have contacted the Internal and External Examiners, and they are expecting to receive this research project soon.

Signature: _____ Date: _____

Cc: Head of Department
Graduate Programme Coordinator