

Education For Sustainable Development? Analysis of Financing Wetland Conservation in The Wetlands Of Kenya

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Financing education is the future towards environmental protection including wetlands. The focus of this paper is to assess if there is conservation education in various wetlands sites of Kenya, and, to evaluate the key challenge facing conservation education in Kenya. This is because the Kenyan wetlands are degrading fast due to exploitation from surrounding communities. The theoretical framework used in this paper is the Network Theory of Castell which focuses on the programming which in this case is finance, the switch which is education and the nodes which are the policies. The research was undertaken in Kenya's three Ramsar sites in the rift valley namely Lakes Nakuru, Naivasha and Bogoria. Primary data was collected from a sample size of 461 community household respondents and 10 site officials on the three sites. Household respondents were given questionnaires while the officials were interviewed. Descriptive statistics was used to get the analyses. The results indicated that education levels were very low in the case study sites explaining wetland degradation due to low levels of funding. The study concludes that the communities living around the wetlands need to have high levels of education and the focal point of Kenya Wildlife Service needs to work closely with the international organisations to get funding to implement the wetland and education policies on the ground.

1. INTRODUCTION

"Water and air, the two essential fluids on which all life depends, have become global garbage cans". Jacques-Yves Cousteau

Life on earth cannot survive without two elements – water and air, and yet we are depleting these elements due to our attitudes, behaviour and lack of knowledge. Wetlands (water bodies) are one of the key assets for the globe to conserve, and they occupy only 6% of the earth's surface (Ramsar Convention Secretariat, 2006). This is because they support vast habitats, biodiversity and provide ample goods and services (Raimondo *et. al.*, 2019; Kumari *et. al.*, 2020). All humans depend on wetlands for survival in one way or the other. The wetlands are depleting fast globally. They need to be protected. Globally over 600 million people depend on the wetlands for survival through mechanisms of agriculture, fishing and tourism (DaCapua, 2015). Wetlands are a vital player in the maintenance of the global hydrological cycle. They regulate the global climate and, at the same time, safeguard ecosystems and human welfare (Hu *et al.*, 2017; Ramsar Convention Bureau, 2001).

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The sustainability of wetlands is critical in having peace, prosperity, economic welfare, and cohesion to improve human welfare and sustainability. According to Cowardin *et al.* (1979), wetlands are "transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is sheltered by shallow water". They cover 9% of the earth's land surface while catering as habitat for amphibians, invertebrates, fish, water birds and flora (Mitsch and Gosselink, 2000; Zedler and Kercher, 2005; Dudgeon *et al.* 2006). However, globally very few people have learnt to appreciate the value of wetlands and hardly live-in harmony with it.

For the protection of wetlands, there is need for conservation education on wetlands. For this type of education to be delivered, conservation finance is required. Conservation finance according to The Conservation Finance Alliance (CFA) is defined as "mechanisms and strategies that generate, manage, and deploy financial resources and align incentives to achieve nature conservation outcomes". In the last few decades, financing conservation has received a lot of attention from various stakeholders which include states, civil societies, individuals as well as the market. The aim is to increase wider network of understanding on the importance and relationship between biodiversity, wetlands and education (Chapin, 2004; Dufy, 2008; MacDonald, 2010a, b; Holmes, 2010, 2012; Bottema and Bush, 2012; Tedesco 2015). This has led to the quest for financing conservation from different networks (Gutman and Davidson 2007; McFarland 2015). In this quest, the strategies for conservation are changing. They are either being done through projects, policies or plans. Each strategy has its own success.

As conservation is affecting livelihoods, it needs a sustainable approach. Thus, through financing conservation, the finances also need to identify the drivers of change and the finance needs. A financial solution is one where there is an integrated approach to solve a specific issue or challenge through the use of finance and other instruments (UNDP, 2018). One way of doing this is to have a self-sufficient financial system which works towards achieving sustainable management of ecosystems, and at the same time, safeguarding everyone's interests. For this to be achieved and results obtained, the solutions should be tailored to the needs of the problem and develop policies in line with this (GIZ, 2018). At the same time, the key stakeholders should be involved in identifying, selecting and implementing both the financial solutions as well as the drivers of change which should be balanced with long term goals (UNDP, 2018).

The focus of this paper is to finance the wellbeing of Kenyan wetlands through the mechanism of education. Over the years, Kenya's wetlands have been facing severe threats. This calls for sustainable measures like education so that the wetlands are safeguarded. The sustainable development goals (SDGs) are well geared towards the sustainability concept of education, which Madam Bruntland had stated in 1987 as "the development which caters for the present generation without jeopardizing the future generations" (UNEP, 1987). Under this, SDG 15 is geared towards protecting terrestrial life, and the wetlands fall under this goal as the

reference of this paper is on inland wetlands of Kenya. Furthermore SDG 4 on quality education fits in very well as this would help man understand the real value of wetlands and thus, reduce or prevent its destruction (Loucks and van Beek, 2017). Scholars like Polajnar (2008) argue that wetlands are being destroyed because of lack of knowledge on the value of the wetland sites in terms of environmental services and functions, leading to more degradation and encroachment.

In Kenya the wetlands occupy 6% of the country's landmass (Ministry of Environment and Mineral Resources, 2012). The wetlands include Lakes Nakuru, Naivasha, Elementaita, Kanyaboli, Victoria amongst others, inland rivers and other inland water bodies. They serve as important water points for communities, wildlife; tourist attraction, habitat for biodiversity, border points between communities and counties, provide food security and are also of spiritual value to communities. Their benefits cannot be counted nor measured monetarily except through mechanisms like total economic values. Thus, wetlands are a rich entity which need to be safeguarded. Many scholars are of the opinion that education would be the best mechanism to safeguard them. According to Do *et. al.* (2014), it is essential to raise the community interest in their surrounding wetlands by creating awareness and providing education through partnerships from the public sector institutions via educational institutions and non-governmental organizations. At the same time, the use of community pedagogies and educational philosophies makes people understand the value of wetlands, which can be incorporated into the education system, especially around wetlands (Hogan, 2008).

To protect global wetlands, the Ramsar Convention (RC) on Wetlands was set up in 1971 with an aim that people are made aware on the values of wetlands (Mathews, 2013). The RC is the first global intergovernmental treaty of wetlands (Erwin, 2009). Under the RC, Article 5 focuses on consultation and cooperation between countries (in case of shared wetlands), communities and other stakeholders through education and public participation (Article 5 {Amended at CoP 7 in 1999}). This is done under the Communication, Education, Participation and Awareness (CEPA) programme. The RC also enables countries to develop their wetland policies which are linked to education and financing wetland conservation (Horwitz and Finlayson 2011; Schoeman et al. 2014). Most governments try to loop in a balance of economic, social and political relationships around these wetlands as they need to justify why saving a natural resource would be of benefit to the majority of the citizens. It is from this justification, that they develop policies (Goulder and Parry 2008). For this paper, policies are the key as they are a link between education and finance. If financiers find the education policies are of benefit to the citizens and can safeguard wetlands for sustainability, they will bring in funds.

This paper is built on Manuel Castell's network theory which is also referred to as "the network society" (Castell, 2000). Under this network there are two processes – programming where there is the ability to develop the network and switching which is the ability to connect. In this case programming is the finance and switching is the education. Between programming and switching is the node for connectivity which in

this paper are the policies. This theory fits in well for this paper as it focuses on creating education for the Kenyan citizens for the protection of the country's wetlands with the link of getting finance through different stakeholders affiliated to different institutions and using policies as a tool to implement the environmental curriculum in schools and wetland sites. This theory fits in well under Article 5 of the RC.

2. LITERATURE REVIEW

From the natural ecosystems globally, wetlands rank first in terms of their values per one hectare. In addition to that, the wetland ecosystem services account for 47% of the values of all global ecosystems (Constanza *et al.*, 1997). This indicates that wetlands need to be protected and restored. Since historical times wetlands have played a key role in ecological and human welfare services, including biodiversity conservation (Fernández and Emeterio, 2017; Raimondo *et al.*, 2019). Wetlands are also part of the infrastructure and protection from floods, droughts and water filtration. Wetlands contribute greatly towards sustainable development, and this is in line with the RC pillar of 'wise use' (CBD 2015), which explains why wetlands need to be restored and preserved (Griscon *et al.*, 2017; TNC, 2018).

2.1. Value of and threats to wetlands

Wetlands are highly valuable to man. They provide ecological values which range from supporting services like biogeochemical cycling, where natural balance is maintained between living and non-living organisms, to habitats for birds, insects and animals and biotic interactions where pollination and maintenance are maintained tropic levels. They also provide provisioning services include food for the living beings, materials, climate regulations and water supply. Wetlands regulate water quality, prevent extreme events like floods and controlling the growth of invasive species. The wetlands are also a source of cultural value where recreation is its component. With all these benefits, SDG 1 on poverty, SDG 2 on zero hunger, SDG 3 on good health and well-being, SDG 13 on climate action, SDG 14 on life below water and SDG 15 live on land can be easily achieved through the conservation of the wetlands.

While wetlands have been of the most value to human wellbeing, this ecosystem is the most degraded. This practice started in historical times where most people considered wetlands to be 'wastelands' (Shah and Atisa, 2021). This belief came about as wetlands have been harbouring mosquitoes and are also a source of death. This led the early European settlers and the respective governments, especially in Asia, Africa, and South America, to clear large sections of wetlands and reclaim them for other uses (Griscon *et al.*, 2017). These trends have also continued to date, resulting in the deterioration of the quality of the wetland (Gardner and Finlayson, 2018; Shah and Atisa, 2021). According to Davidson (2014), 87% of the world's wetlands had been degraded, and this has mainly taken place in the 20th and

the early 21st centuries while Gardner and Finlayson (2018) found that 35% of the global wetlands were already lost.

Most people globally do not understand the value of wetlands as the services of these ecosystems have not been traded on the global stock markets (Xu *et. al.*, 2019). In 2014, research by Constanza *et. al.* indicated that the value of marsh wetland ecosystems had reduced by 9.9 trillion dollars from 1997 to 2011. It is only in the last decade that its services and functions have been seen to be of value (Mitsch and Gosselink, 2015). These threats include human settlements, natural ecosystems modification, transport, agriculture and aquaculture, energy production and mining, pollution and invasive species.

2.2. Key to success

Conservation of wetlands can only be successful if there is sufficient funding to implement conservation tools like education, which could be employed to successfully safeguard wetlands and adapt conservation programmes in response to monitoring and evaluation (Salafsky *et. al.*, 2002). Conservation education goals help in influencing people's knowledge, attitudes and behaviours. Over the years, researchers have proved that education can lead to the sustainability of natural resources, reduce destructive practices and help people understand and comply with legal frameworks and policies (Hogan, 2008; Jacobson, 2010; Fernández and Emeterio, 2017; Atisa, 2020). Knowledge of wetlands influences behaviour related to their protection, and lack of knowledge can be linked to their destruction (Fernández and Emeterio, 2017). This is encouraging countries to move to a knowledge-based economy to achieve sustainable development. Through education curriculums of individual countries, there is the inclusion of environment-related topics. This is in line with UNESCO, which emphasizes the incorporation of Environmental Education (EE) and Education for Sustainable Development (ESD), leading to increased knowledge and awareness about the environment and its interconnection with social and economic factors. In many cases the CEPA programme has made people realize the value of the wetlands globally and locally (Shah and Atisa, 2021). This explains why financing education is critical towards the conservation of these wetlands. This is being done in many countries through wetland policies where education is the key highlight. The focus of wetlands policies is now better geared towards the protection and wise use of wetlands (Kim, 2010; Xu *et. al.*, 2019).

However, many developing countries may not be able to move in this direction as there is insufficient funding for education. In most countries, primary and secondary education is facilitated by the public sector. In developing countries, this is not sustainable. This brings in SDG 17 on partnerships between the public and the private sector. This is very important as many initiatives towards sustainable development in learning institutions in developing countries are hampered due to a lack of funds. This is where Manuel Castell's network theory fits in as finance is obtained through stakeholder involvement with different partnerships.

The objectives for this study are to assess if there is conservation education in various wetlands sites of Kenya, and, to evaluate the key challenge facing conservation education in Kenya. In terms of the variables, education is the dependent variable while finance is the independent variable and policies are the nodes which determine the need for financing the education.

2.3. Financing education

In the context of environmental education, UNESCO defines environmental education as "A learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action". This indicates that environmental education is a multidisciplinary aspect of learning where all subjects including geography, history, languages, maths and law are incorporated. With environmental education, most countries and educationists taught environmental issues as stand-alone topics under various subjects. However, today due to the SDGs and the complexity of environmental sustainability, environmental education has been incorporated into the world of Education for Sustainable Development. Thus, financing education is the only way forward (Arab Forum for Environment and Development, 2019) and needs to be done through well-coordinated institutions like the Ministry of Education and legal frameworks linking conservation with education so that wetland conservation is taken beyond local communities (Shah and Atisa, 2021).

Under this sub-section, the focus is on getting funding and optimising it. It is very important to check on how funds are initially utilised. In terms of optimising funds, it is very crucial to check on the efficiency of the government, institutions, conservation organisations and community-based organisations (CBOs) on how conservation works and how they use the funds to finance education. Researchers have observed that in the name of conservation, be it through education or projects, lot of funds are mismanaged (Igoe *et. al.*, 2010; MacDonald, 2010; Sullivan, 2013; Büscher *et. al.*, 2014). If this is rectified, the funds can be utilised effectively towards conservation education of wetlands leading to their in-situ conservation. Research conducted by Brockington and Scholfeld, (2010), Holmes (2010) and MacDonald (2010) indicate that there is a lot of funding for conservation especially for education. It is only if countries and their focal conservation institutions use their networking through the NGOs, they can access the funds. This is the network which Castell's theory explains.

The funding component should be looked from financial markets, NGOs and individuals (Castells 2000, 2009, 2010). It is of vital value to understand how conservation funds are generated. Globally public sector financing constitutes of 20% funds towards conservation education. This is very minimal compared to individual and donor funding which accounts for 40% (WWF Worldwide Overview FY17, 2018). Approximately 12% is brought in by corporations, followed by

foundations at 10%, while 18% comes from bequests and financial markets. This indicates that donor funding is the core on which countries depend for conservation. However according to the World Wildlife Fund (WWF), countries which focus on using public sector funds for financing conservation education are more likely to attract funding from those who don't (Zwieteren *et. al.*, 2019). According to Hamrick (2016), this is because it is the focal institutions of countries which drive conservation education rather than the donors. This helps individual countries drive the change they want rather than being dictated by donors.

According to Waris (2019), Africa has many treaties which explain how the revenue accrued from taxation is to be used as expenditure which includes health at 15%, food security at 10%, research at 1% of the Gross Domestic Product (GDP), infrastructure, social welfare, debt financing and education. However, expenditure on education has never been budgeted and thus the crisis towards conservation. As this paper focuses on Kenya and its wetland sites, the country must finance its education through the public coffers if the future of the environment, especially wetlands, is to be safeguarded. Once the government starts the initiative, then the private sector joins in.

According to WWF (2013), it was observed that if individual countries had NGO offices in their own countries, there would be better chance of getting funds as cooperates and donors prefer channelling funds through international conservation offices rather than individual governments. This indicates that to make funding more attractive, individual countries need to work closely with conservation offices within their country and at the same time, be more effective towards the implementation of conservation education on the ground. This indicates that countries should lobby and network to have international conservation offices in their countries for getting funds and enabling successful education on wetlands. Also, countries need to strategize themselves on fundraising (Chapin, 2004). Once these international offices are set up in individual countries, it is the national conservation focal points which need to start working with them.

These focal points act as gatekeepers between states, international conservation offices, communities and the education sector. The focal institutions should then work with the international conservation offices on how to develop education policies based on multilateral environmental agreements (MEAs) like the RC. Once the policies are proposed, stakeholder involvement starts. After this the proposed policy is discussed at national parliaments and the policy becomes a legal document. After the domestication of the policy the next step is to implement it (Shah, 2016; Shah and Atisa, 2021). To have implementation success, structures should be in place. A funding proposal is developed by the focal institutions in conjunction with the international conservation offices. The international conservation offices have a lot of experience and networks where they source funding like the Global Environment Facility (GEF), United Nations, United Nations Development Programme (UNDP), World Bank and WWF. They also advise the National Treasury to issue climate bonds or green bonds to help secure funding. Another approach is

to get loans which are subsidised especially if they are for green actions. The World Bank, Swedish Aid Agency and many organisations are all focused on giving such loans towards conservation education funds (Zwieten *et. al.*, 2019).

The Constitution of Kenya (GoK, 2010) in Article 53 (1b) states that every child has a right to free and compulsory basic education. Article 55 (a) mentions that the State shall take measures which include affirmative action programmes to ensure that the youth access relevant education and training. Article 56 (b) highlights minorities and marginalized groups who have a right to be provided with special opportunities in education. For Constitutional implementation, the Basic Education Act (No 14 of 2013) (GoK, 2013) was also passed to regulate basic education and adult basic education in the country. This is where the wetland education comes as many marginalized groups stay along the wetland sites like Lake Bogoria and the Rana River Delta. The children and youth around these Ramsar sites need education and awareness about these sites. With the policies in place, education needs financial components for its full implementation.

Thus, the conservation office for example WWF, African Wildlife Conservation (AWC) etc become the programming networks the help secure funds and channel them in the right direction with education becoming the switch of change and policies, the focal nodes of change. Thus, the network theory of Castell fits in well here. The international conservation officers with the national focal institutions link conservation education to reducing poverty, climate change and aid in ecosystem protection. As a game changer the switch here becomes education.

2.4. African scenario

Africa is a continent with vast natural resources, and they are the future for the continent's development. These natural resources range from terrestrial to aquatic ecosystems and include forests, oceans, deserts and inland water bodies. In many parts of Africa, these natural resources are already over-exploited. Thus, the UNEP African Ministerial Conference on the Environment (AMCEN) Secretariat came up with the Africa Environmental Education and Training Action Plan (AEETAP) 2015-2024 in partnership with the UNEP Environmental Education and Training Unit (EETU). Under this plan, formal and informal education, capacity-building, and information networking components and technology have been incorporated (UNEP, 2017). This aligns with what Russi *et al.* stated in 2013 about formal and informal education being regarded as the foundation for protecting local wetlands. The objective of AEETAP is to improve community environmental education and training and build on environmental programmes and projects by encouraging participation of both males and females equally which is the target of SDG 5 under gender equality. Overall, the focus of the AEETSP is to contribute towards the achievement of the UN Sustainable Development Goals, the post-2015 development agenda, and the New Partnership for Africa's Development (NEPAD) Environmental Action Plan. According to the Global Action Plan (GAP), this is done through policy support, whole-institution approaches (schools and colleges), educators, youth and local

communities. Manuel Castell's network theory fits in well here also as through the networking system, the common goal of conservation education would be achieved through developing and implementing wetland and education policies.

2.5. Case study of Kenya

Kenya has been trying to cater towards conservation education through educational and wetland policies. It has been doing this through project-based mechanisms and education through focal institutions and support from NGOs like WWF. The country has tried various mechanisms to raise funds for awareness creation. However, this is not bearing much fruit. Thus, the country must invest in education conservation.

As the focus of this paper is the wetlands of Kenya and providing wetland conservation education through finance mechanism, it is very important to understand the situation of Kenyan wetlands. Global analysis results of the Wetland Extend Trends (WET) index analysed by the UN WCMC (UN Environment World Conservation Monitoring Centre) (2017) has shown that from 1970 to 2017, the threats to the wetlands have been going down due to education. This indicates that if there is financing towards education in Kenya, our wetlands would be in a better state than they are. This further indicates that the Manuel Castell's network theory is not only a theory but has a practical aspect where funding is brought in through networking and the funds are channelled to the path of conservation education.

Kenya has recognised that wetlands are amongst the most important ecosystems in Kenya (MEMR, 2012). However, these ecosystems are disappearing very fast. Many of the inland water bodies are becoming seasonal like River Mara and lakes like Jipe, Simbi and Chala are drying. Water levels are falling in many water bodies like the Ondiri Swamp and Yala Swamp. This is because the water bodies are faced with encroachment and water is being drained out due to irrigation and settlement (Kiprono, 2015). Many of the wetlands are suffering from population increase as they are found around centres of heavily populated areas. These include the Yala Swamp, King'wal Swamp, Nyando floodplains, Ondiri Swamp and Lake Kanyaboli. There is a lot of farming taking place around these water bodies releasing chemicals and causing eutrophication of the water bodies and growth of invasive species (Shah, 2016). People assume that by draining the water bodies for irrigation would increase the food yields and lead to food security. However, this is in the short term only. In the long term this would lead to slow growth of crops and more chemical inputs, higher food prices, affect people's health and increase poverty (Macharia *et. al.*, 2010; Kiprono, 2015).

Around the Yala Swamp, the Dominion Farm project messed up the water body. The Swamp drains into L. Victoria. The farm's inputs resulted in heavy chemical deposition in the swamp which in turn polluted the lake resulting in the disappearance of many fish and many plant and fish species became endangered. This has threatened the livelihoods of fishermen. It has also destroyed the wetland

habitat which is the home of the critically endangered sitatunga antelope that lives in the swamp. Also, the habitat for 60 species of birds has been destroyed. Livelihoods for the local people who depended on tourism has been lost. Moreover, it has caused health and food security issues while poverty has increased (The County Assembly of Siaya, 2015).

Research conducted by Shah (2016) indicated that according to the RC focal point of the Kenya Wildlife Service (KWS), the main threats to the wetlands are development projects and invasive species. This has been confirmed by the Dominion Farm case study. The same is the situation of Lake Naivasha which has been affected by chemical pollution from flower farms which have been a threat to the fish in the lake. The number of species of fish in the lake have reduced threatening livelihoods and increasing poverty (Mutia *et. al.*, 2012).

The KWS also identified climate change and deforestation to be a high threat to the inland water bodies. This is being witnessed in the water bodies of Lakes Victoria, Bogoria, Baringo, Nakuru, Naivasha and Elementaita where water levels have increased tremendously making people homeless, washing away crops and in turn increasing poverty. The rising lakes have also resulted in health issues like cholera, diarrhoea, bilharzia and other water-borne diseases. There is also the increase in human-wildlife conflict as crocodiles and hippos are attacking humans and livestock. These lakes were a high spot for tourism but now there are hardly tourists as lodges have been submerged (<https://earthobservatory.nasa.gov/images/147226/rising-waters-on-kenyas-great-rift-valley-lakes>).

Thus, the Kenyan scenario explains the urgency of saving the wetlands. That will only come when the communities and citizens staying around the wetlands understand the value of the wetlands besides the economic and cultural values. They must be made to understand the social, environmental and political values of these wetlands. This can only be done through education.

3. THEORETICAL AND CONCEPTUAL FRAMEWORKS

3.1. Network theory

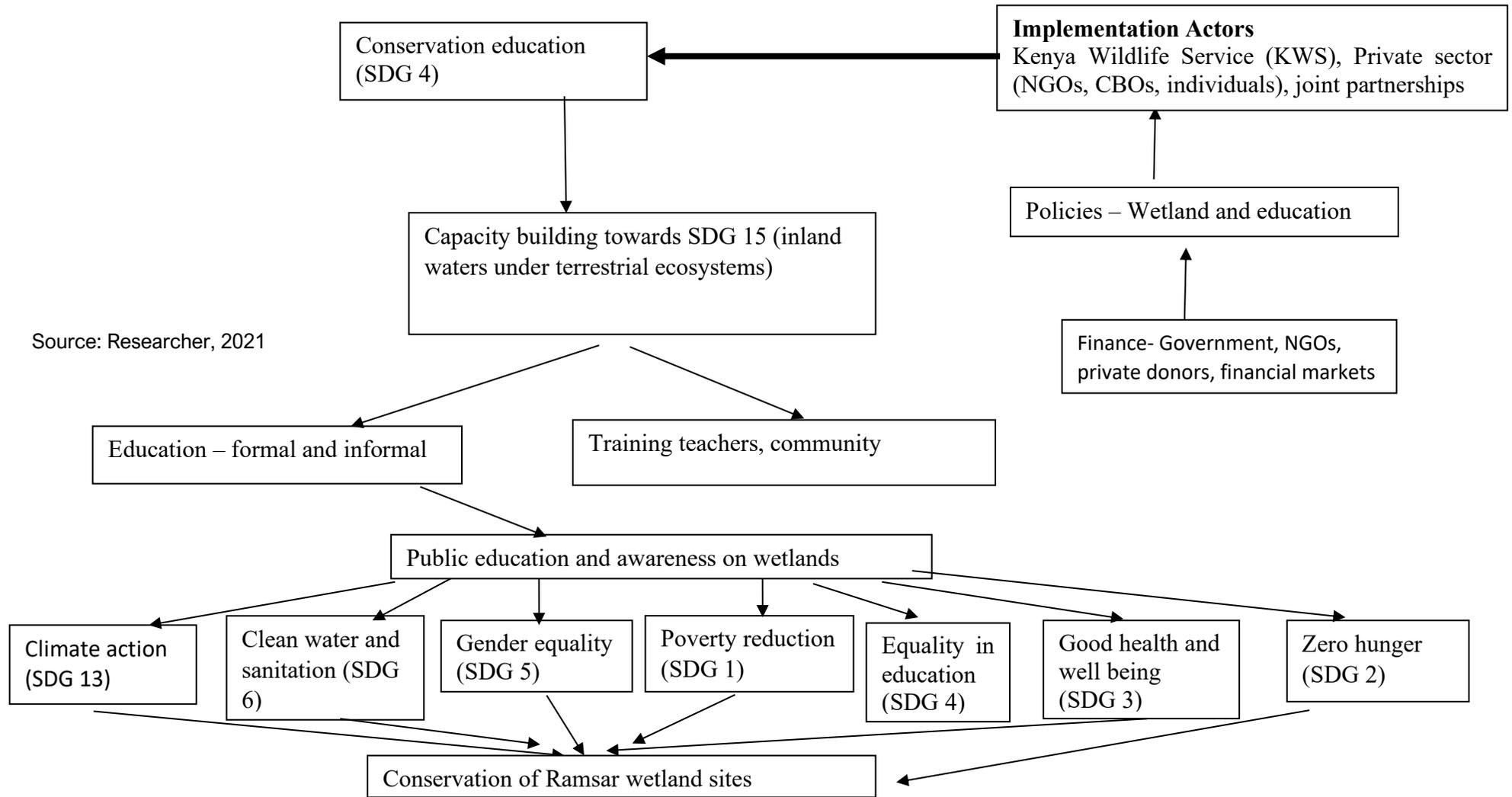
Castell explains the global financial mechanism on how funds are generated for conservation by having networks between states, civil societies and businesses (Castells, 2000). According to him, global, national and regional economic, political and cultural conservation successes are based on these financial networks. This theory is built on a network of inter-connected nodes. When a node is extremely relevant to the network, it has stronger interactions with other nodes. Networks become stronger through expanding information, communication and technology over time which enables effective communication over space. In this case, the network is the pillar of analysis (Castells, 2009). This network is a form of domination and determination which operates under two processes – programming and

switching. Programming is where the ability to develop the network is and in the context of this paper, it is finance. Switching is the ability to connect and cooperate using different networks through common goals which in this context is education. Conservation education depends on finance. The node in this context are the policies and they could be either wetland or education policies.

3.2. Conceptual framework

The conceptual framework in Figure 1 explains how the financing for education is initially done where public, private sectors and the corporate world are involved (networking and programming). Finance is the independent variable. In order to start lobbying for finance, policies (node points) on wetlands and education have to be developed. Once developed, there have to be focal institutions which would be responsible for implementing these policies. This indicates that infrastructure for conservation education (switching) is needed so that inland wetlands are safeguarded (SDG 15). Thus, education is dependent on finance. For education, it is vital to train people for both formal and informal education. Training builds capacity and increases public awareness on wetlands which helps achieve SDGs, namely climate change, clean water and sanitation, wetland protection, poverty reduction, equality in education, good health and wellbeing, gender equality, and zero hunger. In turn, all this increases life expectancy and improves nutrition for families (Akala, 2016). Once this is achieved, people are now in a better state of mind to work towards conserving wetlands.

Figure 1: Conceptual framework indicating how financing education would conserve wetlands



Source: Researcher, 2021

4. METHODOLOGY

The study selected Kenya's three Ramsar sites, namely Lake Nakuru, Lake Naivasha and Lake Bogoria all of which are in the rift valley of Kenya. In terms of the surrounding activities around the lakes, Lake Bogoria is engulfed by rural farming and pastoral communities. Lakes Nakuru and Naivasha are surrounded by urban areas and include both agricultural and industrial activities. Around the lakes of Nakuru and Naivasha, educational institutions are more developed in comparison to Lake Bogoria. Lake Naivasha is a freshwater lake. Lakes Bogoria and Nakuru are saline lakes.

Kenya signed the Ramsar Convention on 5 October 1990 and ratified it on 5th June 1991. The country's first designated Ramsar site was Lake Nakuru in 1990, followed by Lake Naivasha in 1995, Lake Bogoria in 2001, Lake Baringo in 2002, Lake Elementaita in 2005 and the Tana River in 2012 (GoK, 2015).

Lake Nakuru is a shallow, alkaline, and saline endorheic (closed basin) lake. It is located 160 km west of Nairobi in the eastern part of Nakuru County in the Rift Valley region. The lake is part of Lake Nakuru National Park, and it occupies 44 km² with a catchment area of 1,800 km² (WWF, 2000; KWS, 2002; Thampy, 2002). Lake Nakuru was designated as the first Kenyan Ramsar site on June 5th, 1990, as Ramsar site No. 476. Lake Nakuru is home to globally endangered bird species such as flamingos and supports 1% of the lesser flamingo population (Criterion VI for Ramsar sites).

Lake Naivasha is a shallow basin freshwater lake on the floor of the eastern Rift Valley, lying between 0°45' South and 36°26' East (Everard and Harper, 2002). The lake is the second Ramsar site of Kenya and was designated on October 4th 1995 as Ramsar site No. 724. It provides forage and breeding grounds for more than 350 resident and migrant bird species, including 1% of the world red-knobbed coot or crested coot *Fulica cristata* population; fish; and hippos and waterbucks, around the riparian parts of the lake.

Lake Bogoria has an area of 34 km². The lake is endorheic and saline and is located in a catchment basin covering 1,200 km² within the Rift Valley. It has high alkalinity with a pH ranging between 9.8-10.6 (Baringo County Council [BCC] and Koibatek County Council [KCC], 2007). The lake is part of the flamingo lakes of Kenya. It hosts 75% of all the migratory lesser flamingo population of the country (Criterion VI for Ramsar sites) and more than 300 bird species and a habitat for endangered mammals such as the greater kudu. Lake Bogoria was designated as a Ramsar site on August 27th, 2001 and is Ramsar site No. 1097.

Structured interviews were carried from November 2014 to February 2018. The sampling framework consisted of the households living around the three lakes and random sampling method was used to select the households. Heads of households of all communities living around the study sites, local government officials especially

those representing the focal office of KWS at the study site and senior staff working with national and international organisations and CBOs were part of these interviews. A total of 461 community members – 342 men and 119 women headed households were interviewed. The local government officials as well as the senior staff working at with the national and international organisations were interviewed on issues to do with funding and education. They totalled ten in number.

The respondents were asked on their levels of education, whether they benefitted from the lakes in any way and whether they were taught on how to safeguard the water bodies when they were in school. The levels of education and whether they were taught on sustainability of the water bodies were key questions to understanding the reasons of threats to the water bodies. Education was the independent variable and whether the people were taught on safeguarding the water bodies was dependent on education.

5. FINDINGS AND DISCUSSIONS

For effective protection of wetlands, communities, landowners and local authorities must be involved in understanding the value of wetlands so that they can be protected. Usually there has to be an influencing variable like education where schools, conservation organisations and the government must be in-charge. Schools are the key for creating this conservation awareness. In Kenya's case, the focal institution of KWS should coordinate with the schools and the guides at the wetlands must be encouraged to nurture this education in children who come to see the lakes. They should also regularly visit schools to create this awareness.

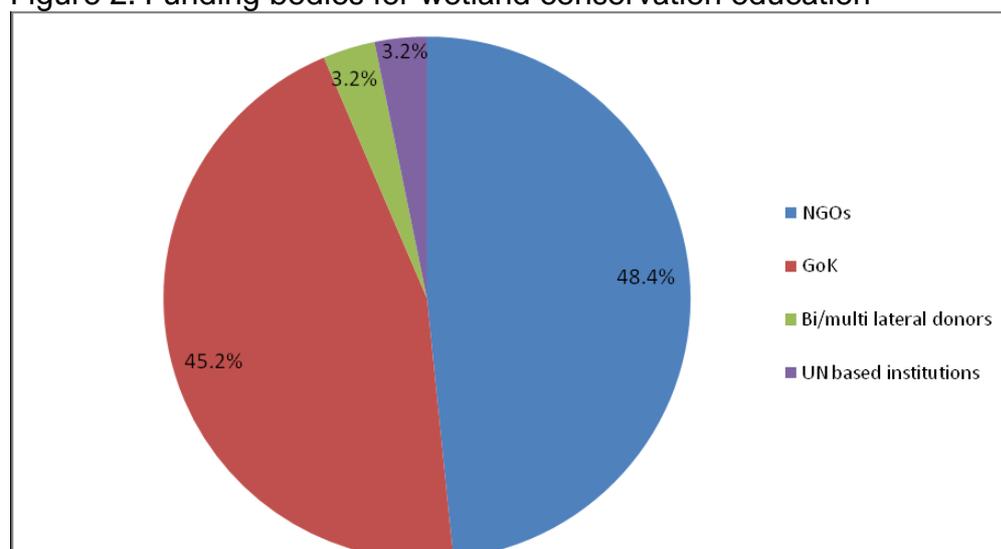
The findings of this study indicated that the majority (194) of the respondents had primary education, though they were less than half of the respondents. This was followed by secondary (177), then informal (52), university education (33) and 5 had no education. The overall indication is that very few people have education above secondary level. This means that people with no or limited education may not be able to link between education, and protection of wetlands (Gadd, 2005; Breitmeier *et. al.*, 2006). Without education, communities cannot make choices to what extent they need to protect wetlands (UNESCO, 2005). Conservation education at nursery and primary is generally very shallow for children to understand the value of wetlands. It is from secondary to tertiary level that the value of wetland education is inculcated, and its effectiveness can be measured. The overall results indicate that it was around Lake Naivasha and Nakuru that most people were better educated with secondary and tertiary education than around Lake Bogoria. However, with L. Naivasha having higher level of education than Lake Bogoria, the lake was almost put on the Montreux Record of threatened sites due to ecosystem degradation (Peck, 2008). This explains Kenya's position on wetland protection, and it implies that the policies in place are not being implemented and thus, education is not reaching the grassroot levels (Department for International Development [DFID], 2002, Shah, 2016, Shah and Atisa, 2021).

Research in other parts of the world indicates that education is the key to conservation and is linked to external economic relations. Good education and wetlands policies bring in foreign aid and investment. This helps access the country's priorities on conservation and education (Miller, 2014). According to Adams and Hutton (2007), a country's conservation and education policies are meant to attract funding, investment and tourists. The policies also indicate the strength of the country's capability to address the SDGs (Leenhardt *et. al.*, 2013). Pellegrini and Gerlagh (2006) have also indicated that democratic societies value conservation education and have good policies to reduce environmental degradation (Li and Reuveny, 2006). When countries have people with lower academic qualifications, environmental degradation is at the peak and has its toll on the poor (Klugman, 2011). In many parts of the world, conservation education programmes are partnered between school and communities. In this way, they can conserve the wetlands better. For example, this is being done around the Murchison Falls in Uganda (Infield and Namara, 2001).

In countries where they have the CEPA programmes on wetland conservation, individual wetlands are better protected, though it also depends on funding. For example, in Kenya, the Elsamere Centre in Naivasha provides valuable education on wetland conservation to schools and colleges. The same applies to the Kenya Wildlife Service Training Institute which offers specialised training on wetlands (Shah, 2016). The same is the case for Lake Nakuru which has the Wildlife Clubs of Kenya (WCK) Education Centre. This also explains why education levels are high around Lakes Naivasha and Nakuru. The WCK has partnered with the KWS and have set up the country's largest education centre inside Lake Nakuru National Park. This centre is visited by over 100,000 children on an annual basis. This partnership has enabled children to learn about the values and threats to wetlands and how to protect them (<https://www.kws.org/parks/education/>).

This study also found out the funding bodies which supported wetlands conservation education in Kenya. The NGOs were found to be the major source of funding at 45.2% and they include the International Union for Conservation of Nature (IUCN), African Conservation Centre (ACC), African Wildlife Fund (AWF), WWF, Wetlands International, Kenya Forests Working Group, Birdlife International and Wildlife Conservation Society and Wildlife Direct amongst others. This was followed by the Government of Kenya (GoK), bilateral and multi-lateral donors namely United States Agency for International Development (USAID), European Union (EU) and the Japanese Government. The UN based institutions also funded 3.2% of the wetland conservation efforts and included the Global Environment Facility and the United Nations Development Programme. This is illustrated in Figure 2.

Figure 2: Funding bodies for wetland conservation education



Source: Author, 2019

At the individual sites namely Lakes Bogoria and Naivasha, funding came in through WWF, IUCN, Wetlands International and Birdlife International. For Lake Nakuru, the funding came from the GoK. This means that Kenya needs to improve upon its wetlands and education policies so that they can communicate better with the NGOs, bi/multi-lateral donors and UN based institutions for funding the education sector.

The KWS focal institution which is in-charge of the country's wetlands had its staff respond to improvement mechanisms of the wetlands. The response indicated that majority wanted better formulation of policies, better funding, education and awareness creation, involvement of local communities and more staff for onsite and school visits. This is shown in Table 1.

Table 1: Strategies towards wetland conservation

Improvement mechanism for wetland protection	Responses
Better formulation of policies	90%
Better funding	90%
Involvement of local communities	75%
More staff for onsite and school visits	75%
Education and awareness creation	85%

Author, 2019

6. CONCLUSION

The reason for the failure to achieve desired conservation outcomes is inadequate engagement with community efforts, perceptions and socioeconomic needs due to lack of education and awareness on the part of communities and the citizens at large. Implementation gaps in government-led initiatives are magnified when all stakeholders are not well-informed especially the communities as the networking are poor. To create well-informed stakeholders, families, neighbours, and communities should be educated to enhance wetland conservation outcomes and improve management.

Kenya as a country has not yet developed an effective education and awareness system to inform local communities and all its citizens of the environmental degradation around wetlands. Inland wetlands cannot be managed in isolation from community needs. Moreover, education levels are low among the majority of communities, and this also reduces their effective participation in decision making in enhancing education and awareness. The country must develop solid education and wetland policies where there is a high stakeholder involvement to see the implementation and success of these policies. Only then, there will be attraction of funding from various national and international donors.

Kenya has the goodwill to protect the wetlands. But the key challenge is that the communities living around the wetlands live in adjunct poverty and thus fail to protect the wetlands as they only reap from the direct benefits. This is because they do not have the right educational knowledge to put conservation first and in turn, enjoy the rewards. Institutions must towards education in line with the conservation policies so as to attract funding to pave way for sustainable education and awareness on the Kenyan wetlands.

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