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Full Length Research Paper

Assessing community participation in the strategic environmental assessment and land use plan of Yala Wetland ecosystem, Lake Victoria, Kenya

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Effective community participation in Strategic Environmental Assessment (SEA) and Land Use Planning (LUP) is key to wetlands' sustainable management. Yala Wetland key challenges of land and water resource use for competing interests prompted Siaya and Busia County Governments to initiate preparation a LUP/SEA to resolve these and enable it to sustainably support local residents' livelihoods and protect its ecological integrity. A LUP/SEA Framework with Yala Project Advisory Committee for local communities guided the planning process and implementation. Concurrently, an action research was conducted to assess community participation, identify the local communities' key environmental issues, and incorporate them in the SEA/LUP outcomes. Research data came from 410 respondents from 60 local community groups, 34 key informant interviews; 187 students and satellite images. The study revealed that the utilization of Yala resources had been partly informed by how the wetland communities perceive its formation, communities managed the wetland ecosystem using various indigenous knowledge systems that promoted wise utilization and concern for the other users, satellite images analysis corroborated some communities' findings, absence of community sensitive governance structures in wetland's management. The study integrated local communities' vast knowledge and planning information in the final LUP and facilitated formation of Yala Swamp Management Committee with communities at the centre of conservation. Therefore, improvements to sustainably manage Yala wetland ecosystem has to embed community participation in all stages from planning, implementation to evaluation. These missing pieces have since been incorporated in the final Yala LUP and Indigenous Community Conservation Area Management Plan 2019-2029.

Key words: Yala wetland, community participation, land use planning, governance.

INTRODUCTION

Effective community participation in Strategic Environmental Assessment (SEA) and Land Use Planning (LUP) is key to wetlands' sustainable management. Community participation in natural resource management has evolved from the realization that people living with natural resources should be

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responsible for their management and benefit from using the resources (Ostrom, 1990; WWF, 2006; Lockie and Sonnenfeld, 2008; GoK, 2010a). Wetlands occur where the ground water table is at or near the land surface, or where the land is covered by water (Ramsar Convention Secretariat, 1996), and are one of the world's most important environmental assets which provide homes for large, diverse biota as well as significant economic, social and cultural benefits related to timber, fisheries, hunting, recreational and tourist activities. They constitute an important resource for riparian communities and therefore it is important that communities participate in their management. The Aarhus Convention of 1998 states that citizens must not only have access to information but must also be entitled to participate in decision making and have access to justice in environmental matters (DETR, 2000; Stec et al., 2000). However, participation of local communities in seeking solutions to wetlands resources use remains a grave challenge as managers of participation processes engage in low level consultations that do not empower them to co-manage these resources alongside government agencies mandated to do so (GoK, 2010a; Springate-Baginski et al., 2009).

A synthesis of research and policy priorities for papyrus wetlands presented in Wetlands Conference in 2012 concluded that more research on the governance, institutional and socio-economic aspects of papyrus wetlands is needed to assist African governments in dealing with the challenges of conserving wetlands in the face of growing food security needs and climate change (van Dam et al., 2014). The other three priorities were the need for: better estimates of the area covered by papyrus wetlands as limited evidence suggest that the loss of papyrus wetlands is rapid in some areas; for a better understanding and modelling of the regulating services of papyrus wetlands to support trade-off analysis and improve economic valuation; and, research on papyrus wetlands should include assessment of all ecosystem services so that trade-offs can be determined as the basis for sustainable management strategies('wise use').

In Africa, wetlands degradation is on the increase as wetland ecosystems are relied upon to lessen industrial, urban and agricultural pollution and supply numerous services and resources (Nasongo et al., 2015; Kansiime et al., 2007). Similarly, lack of recognition of the traditional values of these wetlands, desire for modernisation and failure to appreciate their ecological role aggravates their degradation (Maclean et al*.,* 2003; Panayotou, 1994).

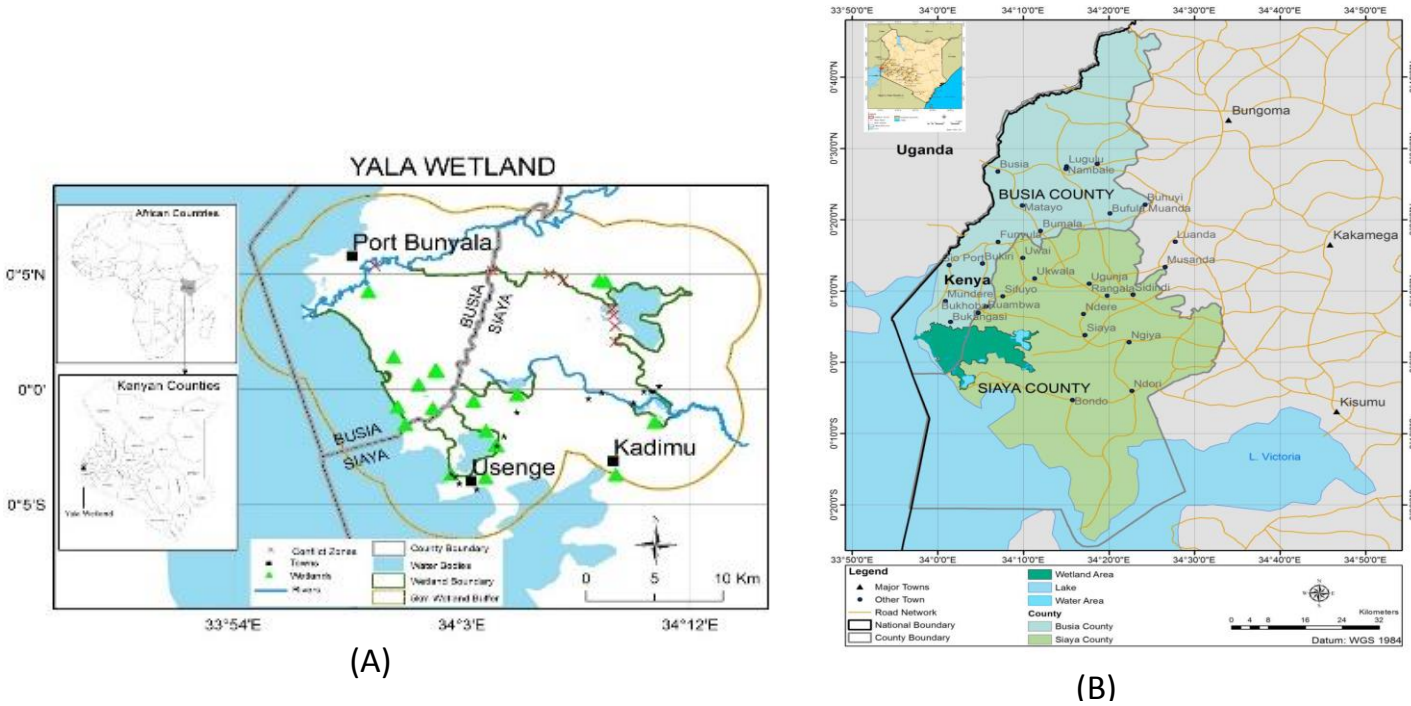
Public participation has been the focus of many Environmental Impact Assessments (EIAs) and Strategic Impact Assessment (SEA) studies globally (Doelle and Sinclair, 2005; Hartley and Wood, 2005). This article defines public participation as the process of ensuring that those who have an interest or stake in a decision are involved in making that decision. Participation has become a key element in the discussion concerning development particularly in natural resources management (Cooke and Kothari, 2001). Today, the concept is seen as a magic bullet by development agencies who are making participation one, if not the core element of development (Michener, 1998).

According to the International Association of Public Participation (IAP2, 2008) public participation consist of five levels: Information (lowest level, where participation does not go beyond information provision), consultation, involvement, collaboration and empowerment (highest level, where the public are given a final say on the project decision. Okello et al. (2009) study on public participation in SEA in Kenya concludes that it is unsatisfactory. The study noted that Environmental Management and Coordination Act (EMCA) of 1999 and its 2015 amendment and Environmental Impact Assessment Audit Regulations 2003 (EIAAR) did not have provisions detailing consultation with the public during SEA and that knowledge and awareness of the public at all levels of society were found to be poor (EMCA, 2015). The undoings of public participation include information inaccessibility in terms of readability and physical access, inadequate awareness of the public on their roles and rights during EIA, incomprehensible language and incomplete regulation for public participation during SEA. These undoings have to be overcome if public participation in Kenya has to be improved and move to higher levels (that is, collaboration-empowerment) of participation on the spectrum of public participation level.

Community participation in Yala Wetland SEA and LUP

Yala Wetland is an important resource shared by Siaya and Busia counties of Kenya. It supports the livelihoods of surrounding communities, including water, papyrus and fisheries, among others, and provides vital ecosystem services such as purification and storage of water. It also acts as a carbon sink, thus regulating global and local climatic conditions and is internationally recognized as a Key Biodiversity Area that hosts globally and nationally threatened bird, fish and mammal species. The Wetland is also an important agricultural asset that has attracted both local farmers and external agricultural interests (EANHS, 2018).

This important resource is facing many challenges that revolve around land and water resource use for competing interests and also from catchment degradation (GOK, 2018; Odhengo et al., 2018a; Ondere, 2016; Odero, 2015a, b; Muoria et al., 2015; van Heukelom, 2013; Raburu, 2012; Thenya, 2012; Onywere et al., 2011; GOK, 2010; Kenya Wetland Forum, 2006; Lihanda et al., 2003; Otieno et al., 2001; GOK, 1987). These challenges pointed to the need for a well-considered Land Use Plan (LUP) that would provide a rational and scientific basis for future development and use of the



(A) (B)

Figure 1. Location of Yala Wetland in Lake Victoria Basin.

resource. This situation prompted and encouraged County Governments of Siaya and Busia, and Nature Kenya to initiate processes that culminated in the present effort to prepare a LUP that will help resolve these challenges so that Yala Wetland will be able to sustainably support local residents' livelihoods while its ecological integrity and that of its associated ecosystems is protected.

Preliminary processes implemented by Inter-ministerial Technical Committee (IMTC) and a Deltas Management Secretariat prepared a LUP Framework to guide the planning process and was agreed upon by stakeholders. The IMTC's responsibility is coordination, policy and planning processes of major deltas in Kenya. The Framework was as result of a participatory and collaborative process that involved various stakeholders at the local, county and national levels. As required by Kenya Constitution article 69(1) and part VIII section 87-92; section 115 of County Government Act, 2012 on devolution provisions and part 2 section 6 (1-2) Public Participation Bill, 2020 provided for participation of local communities in the Land Use Planning process through a Yala Project Advisory Committee (YPAC) (GOK, 2010, 2012a, b; 2020). The LUP process also benefited from a SEA process that served to assess the environmental implications of the Land Use Plan. The action research reported in this paper sought to: 1. Assess the historical and current state of community participation in SEA/LUP of Yala wetland ecosystem management. 2. Identify the local communities' key environmental issues for SEA/LUP of Yala Wetland ecosystem management. 3. Incorporate the results in the Yala Wetland SEA/LUP Processes.

MATERIALS AND METHODS

The Yala wetland area

Yala Wetland is located on the north eastern shoreline of Lake Victoria between 33° 50' E to 34° 25'E longitudes to 0° 7'S to 0°10'N latitude (Figure 1), and is situated on the deltaic sediments of the confluence of both Nzoia and Yala Rivers where they enter the north-eastern corner of Lake Victoria. It is highly valued by local communities (NEMA, 2016). Yala Wetland is Kenya's third largest wetland after Lorian Swamp and Tana Delta and has a very delicate ecosystem. It is shared between Siaya and Busia counties of Kenya and covers an area of about 20,756 ha (about 207 Km^2) (JICA, 1987; LBDA, 1989; Odhengo et al., 2018a).

The Wetland and its environment have a high human population density: the Siaya County side was estimated at 393 per Km^2 in 2009 while Busia County had a higher concentration of 527 persons per Km^2 (KNBS, 2010). The 2019 National Census showed that the population of the two Counties were 743,946 with a growth rate of 1.7% and 833,760 with a growth rate of 3.1% respectively. The population of the planning area (wetland and its buffer of 5km radius) was estimated at 130,838 in 2014 and projected to be 171,736 in 2030 and 241,280 in 2050 (KNBS, 2010). The mean household size was 5.05, although density in the wetland and adjacent areas were not uniform. The study focused on the communities inside and within 5km from the wetland boundaries because their propensity to use the wetland is inversely related to travel distance (Abila, 2005), and also extended to communities living in the lower catchment of river Yala whose activities affect the Wetland water flow and quality IWMI, 2014).

Plate 1. Sunset view at Lake Kanyaboli Resort in Lake Kanyaboli -ox bow lake.
Photo credit: Author.

Annual rainfall in Lake Victoria Basin (LVB) is bimodal. Precipitation in the Yala/Nzoia catchment is high in the Northern highlands (1,800-2,000 mm/yr) and low in the South-Western lowlands (800-1,600 mm/yr). Local rainfall contributes to Yala Wetland water. The Wetland area has a variable, bimodal rainfall pattern that generally increases from the lake shore to the hinterland (Ekirapa and Kinyanjui, 1987; Awange et al., 2006), with the mean annual rainfall ranging from 1050- 1160 mm. The mean annual daily maximum and minimum temperatures are 28.9^{o} and 15.9°C respectively – giving a mean annual temperature of 24.4°C (Luedeling, 2011; Semenov, 2008). The hydrological conditions are characterized by five main water sources namely: inflows from the Yala River, seepage from River Nzoia, flooding from both rivers, backflow from Lake Victoria, local rainfall and lakes within the Wetland (Okungu and Sangale, 2003). River Yala is the main source of water for the wetland and the satellite lakes. The naturalized mean monthly discharge is 41.1 m^3/s. The lowest flows barely fall under 5m^3 /s in the months of January to March while the highest discharge of 300 m^3/s occur in the months of April/May and August/September. The minimum suspended silt load of River Yala Water is 543 ppm (BirdLife, 2018; Sangale et al., 2012; Okungu and Sangale, 2003).

The river flows on a very shallow gradient through small wetlands and saturated ground over its last 30 km to the Lake. Very high clay content of the soils impedes ground water flow but there is known to be gradual water seepage into the northern fringes of the Wetland. Flooding occurs annually and the very high discharge overtops the river channels, flooding into the Wetland. Parts of the western wetland lie below the level of Lake Victoria and are constantly filled with backflow in addition to being subjected to flooding from the lake and upper catchment. The water balance for Yala Wetland also includes the water retained within the three freshwater lakes found within the wetland: Kanyaboli (10.5 km^2), Sare (5 km^2) and Namboyo (1 km^2). Lake Kanyaboli has a catchment area of 175 km^2 and a mean depth of 3 m. Lake Sare is on average 5 m deep and Lake Namboyo has a depth of between 10 to 15 m (NEMA, 2016; Owiyo et al., 2014; Dominion Farms, 2003; Envertek Africa Consult Limited, 2015).

Environmental livelihoods of the wetland communities

Yala Wetland has diverse scenic sites, including Ramogi Hills, Usenge sandy beaches, Osieko beach sand dunes, Oxbow lakes, migratory birds, and endangered wildlife species. Potential tourist attractions in the Wetland include the scenic appeal, bird watching, wildlife viewing, sport fishing, boat riding, outdoor sports and several cultural and traditional ceremonies. However, tourism potential for the area is largely unexploited and poorly developed at present. Muoria *et al* (2015) estimated that visitors to Yala Swamp contribute Kshs 1,170,200 (USD$1,170.2) annually to the local economy. This is a very low value compared to the estimated potential of Kshs 499,912,500 (USD$ 500,000) estimated by Kabubo-Mariara *et al* (Unpublished data) who used the willingness to pay method (Plate 1).

Cultural diversity and educational values

The communities of Yala Wetland have diverse cultural practices and beliefs, some of which can be exploited for tourism and for conservation. They have strong attachments to the wetland because of their social, cultural and spiritual importance. Some religious/spiritual purposes include baptism, traditional passage rites and ceremonies appeasing evil spirits, cleansing, as shrines etc. The communities also promote indigenous knowledge and practices on environmental functions and values essential for their survival such as the use of medicinal herbs. Some villages in the wetland are assigned custody of clan spirits hence the residents consider it their duty to protect the graves and shrines of their departed clan members (Odero, 2020). However, there is lack of sound documentation and uptake of indigenous knowledge in biodiversity conservation.

The Yala Wetland has immense potential for scientific research, formal and informal education, and training values as the ecosystem is ideal for excursions and fieldwork for learning institutions, and can serve as important reference area for

Table 1. Breakdown of community members who took part in the study.

Gender	Number N(%)	Over 35 years N(%)	Youths (under 35 years) N(%)	Person with disability N(%)
Male	223 (54.3)	116 (52.0)	106 (47.5)	1 (0.5)
Female	187 (45.6)	96 (51.3)	91 (48.7)	
Total	410	212(51.7)	197(48.1)	1(0.2)

Source: Author (2018).

monitoring environmental vulnerabilities such as floods, drought and climate change. The Wetland is also an effective ecosystem for carbon storage. A detailed study in the Wetland confirmed that it is currently storing close to 15 million tonnes of carbon within the papyrus swamp, with less than 1 million tonnes stored in the adjoining farmland and immature papyrus areas (Muoria et al., 2015), revealing that natural and semi-natural papyrus dominated habitats are better carbon sinks than drained farmed areas.

The Wetland is an exceptionally rich site for studies in biodiversity. Over 30 mammal species have been recorded in the Wetland, including the Sitatunga (*Tragecephalus spekeii*), a semi-aquatic antelope that is nationally listed as Endangered (Thomas et al., 2016; GOK, 2013; KWS, 2010; IUCN, 2016). It provides a critical refuge for Lake Victoria cichlid fish, many of which have been exterminated in the main lake by the introduction of the non-native predatory Nile Perch *(Lates niloticus)*. Recent surveys in Lake Kanyaboli recorded 19 fish species within nine families, which included all the two critically endangered cichlids species: *Oreochromis esculentus* and *Oreochromis variabilis* (IUCN, 2018; KWS, 2010; Ogutu, 1987a; Ogutu, 1987b). The fishes use the wetland as a breeding ground, nursery, and feeding grounds (Aloo, 2003).

Action research design

Given that the LUP/SEA process had started, action research was the best methodology to unravel participation issues therein. This approach assists the "actor" in improving and/or refining his/her actions (Stringer, 1999; Mills, 2000). Also, action research seeks transformative change through the simultaneous process of taking action and doing research, which are linked together by critical reflection (Lewin, 1958; Johnson, 1976). It is problem centered, client centered, and action oriented, and involves the client system in a diagnostic, active-learning, problem-finding and problem-solving process. The research was done under the regulations and guidance of School of Environmental Studies who subjected the study through its internal review processes and enriched the final outcome-The Yala Hub Framework. The study permit was obtained from the Kenya National Commission for Science, Technology and Innovation.

Sampling and data collection

The study used purposive and stratified sampling to collect both qualitative and quantitative data. A total of 410 respondents from 60 local community groups participated in focus group discussions (FGDs) from the Wetland and adjacent buffer zones (Table 1). The targeted organizations included those who were actively involved in wetland conservation within the last five years; have been affected in one way of the other with projects within Yala Wetland, have been a member of an interest group during a LUP/SEA studies in Yala Wetland, or have been involved in research and training in Environmental conservation, EIA or SEA. The community organizations included beach management units (BMUs), Environmental Conservation groups, women groups, youth groups, Hawinga Boda Boda, smallholder farmer's cooperatives, Weavers Umbrella group, Lake Kanyaboli Nurseries, religious leaders' associations, sand harvesters, Yala Swamp Site Support (YSSG), and YPAC members.

The 60 community organizations were drawn from all the sub-locations/wards of Yala wetland and buffer zones. Each community organization had only one group of 10 persons participating in FGD irrespective of its total membership. The community organizations' membership ranged between 8-60 persons with mixed economic abilities but drawn by the mission and ideals of the specific group. The age of members ranged between 15-85 years; the youngest organization was five years while the oldest was 30 years old. The 10 respondents invited to participate in the FDGs were chosen to represent diversity within the groups and the FGDs were held in locations convenient for local communities. They were mainly group members, active and retired civil servants, teachers, retired teachers, respectable elders who were deemed as custodian of communities' information and religious leaders. Natasha et al. (2005) maintains that FDGs are very advantageous as they allow collecting substantial data from many people within a very short period. The structure of these FGDs was kept open, allowing feelings and characterizations to emerge from the participants themselves (Dawson et al., 1993, Krueger and Casey, 2008; Yin, 2015) on background information about the wetland, their opinions, ideas, perceptions, and beliefs and experiences that influenced their interactions in the wetland and their involvement in its management over the years (Likert, 1932). Data was recorded both by written notes and video recordings.

Key informant interviews with 34 highly respected elders and change makers from Usenge, Usigu, Kombo, Hawinga, Uhembo, Bunyala were conducted between April and June 2016. The elders were those considered by communities as custodians of the Yala Wetland historical, cultural and indigenous knowledge information. The data collected include: formation of the swamp, local/ indigenous knowledge used by local communities to manage Yala Wetland; challenges, their causes and what could be done to turn them into opportunities, their thoughts on the level and effectiveness in the communities participation in Yala wetland. Information received was corroborated with other literature on Yala wetland to provide historical and contextual information. They included deputy chairperson of the Luo Council of Elders from Yimbo, an elder who had also established a Yala community museum in Kombo beach at the shores of Lake Kanyaboli; an elder from Misori Kaugagi; an elder and a youth from Bunyala islands (Figure 2; Plate 3). They narrated the history of the wetland, significant events and trends and their implications. These interviews were video recorded and later used for analysis of the research data. At the end of each interview session and end of the day the researcher set aside time to record research activities for the day, his observations and experiences for the day and critical reflection in the researcher's journal (Duveskog, 2013; Greene,

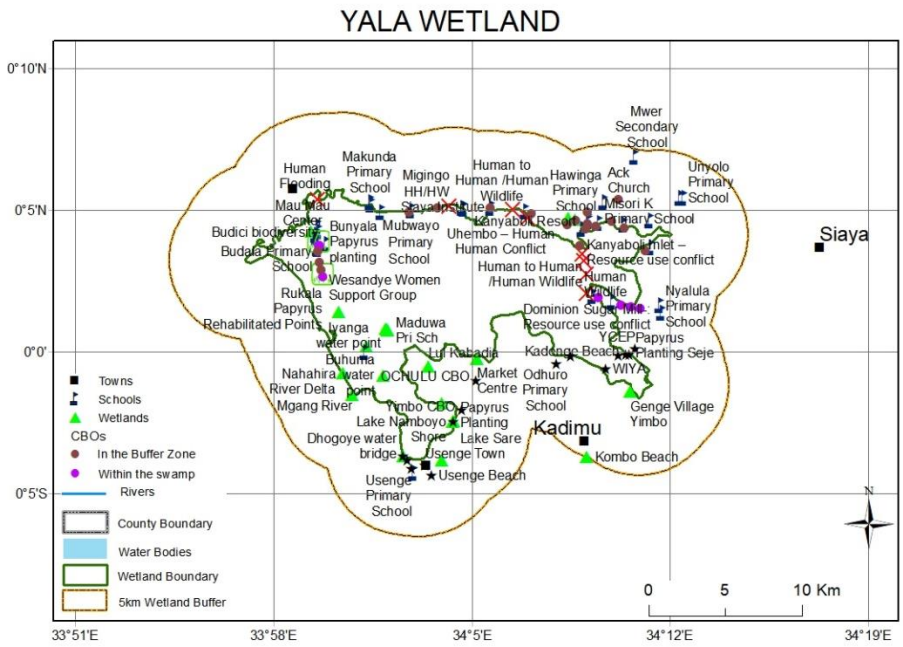


Figure 2. The geolocations of Community Organizations and Schools in the Yala Wetland Ecosystem mapped during the study.
Source: Author (2019).

Plate 2. Yala SSG Chairperson (right) presents a certificate of merit to a pupil of Nyakado Primary School for emerging as the best in an essay writing competition on children's dream/vision for Yala swamp in the school. The Head teacher and the researcher are overseeing the award ceremony.

1995; Leggo, 2008).

Data was also collected from 187 students who participated through essays writing, debates, poems and artistic works on the Yala Wetland issues and were rewarded for outstanding performance as shown in Plate 2. These were drawn from primary (12), secondary (5) and post-secondary polytechnics and colleges (2) in Yala wetland and its buffer zone. This data was part of what the modified community participation Yala community participation framework brought to the SEA/LUP processes. Further data was collected from satellite images to show the trends of land use and

Plate 3. Researcher and Research Assistants travelling to Yala wetland islands for community meetings as part of increasing community participation in LUP processes.

Table 2. Grading of responses.

S/N	Grade (%)	Rank
1	1-16	Very poor
2	17-33	Poor
3	34-50	Unsatisfactory
4	51-67	Satisfactory
5	68-83	Good
6	84-100	Excellent

land changes over time. The qualitative data requires triangulation and the data from the learning institutions helped with triangulation as well as bringing students perspectives to the study.

Sample size determination for this research was based on judgment with respect to the quality of information desired and the respondents' availability that fit the selection criteria of active involvement in Yala swamp conservation activities (Sandelowski, 1995). Neuman (1997) asserts that it is acceptable to use judgment in non-random purposive sampling and reiterates that there is no 'magic number'. Thus, the 410 community respondents, 34 key informants and 187 students were representative of the wetland communities who were actively involved its management.

Data analysis

Qualitative data were analyzed using content analysis methods. This allowed the researcher to categorize and code the collected information based on participants' responses to each question or major themes that emerged from FGDs, in-depth interviews, essays, debates and artworks. Content analysis, as Babbie (2015) argues is useful since it captures well the content of communications generated through interviews, essays and FGDs in an inductive manner, where themes were generated based on emerging similarities of expression in the data material. Many of these elements provided quotations in the write-up of research findings and other similar elements were quantified using descriptive statistics to give a sense of the emerging themes and their relative importance according to the respondents. Priority ranking of issues was done to arrive at overall prioritisation of issues by wetland communities that informed the final LUP content.

The study dealt more with people's perception than with statistically quantifiable outputs. Thus, data analysis to gauge these perceptions was done by calculating percentage response (Neuman, 1997). The response rates were calculated using the following formula.

$$Response(\%) = {}^{x}/_{y} * 100$$

Where x: respondent groups who gave feedback and y total number of respondent groups. To grade the percentage response, a modification of Lee's (2000) EIA study review package was used (Table 2).

Table 3. Adjudication criteria for Yala Swamp essay writing, poems and sermons.

Information	Marks
Background Information (understanding of Yala swamp)	10
Context (problems/challenges and solution identification)	10
Creativity (new ideas, simple to implement, behaviour)	10
Vision/Dream (desired future, compelling case/strong advocacy/	10
Total	**40**

Schools essays, debates and artwork analysis

A select team of panelists that adjudicated the learning institutions entries comprised of the Researcher, one Research Supervisor from SES, Program Manager from Nature Kenya), Research Assistant from SES and Siaya County Director of Education. Each panelist marked the 187 essays and art works, guided by the following parameters: background information, context, creativity, vision and dream, all seen as identification of appropriate key challenges of the Yala Wetland and prescription of potential solutions that address the identified challenges. The potential highest was forty marks. The parameters were based on the issues that SEA and LUP were investigating to inform the development of Yala Wetland LUP and ecosystem management. Table 3 shows the adjudication criteria for students' submissions. The individual panelist scores were recorded and the average score tabulated to arrive at the overall score for the entries. The top 3 students from every school were awarded prizes as well as participating institutions. The essays school entries were further analysed using content analysis to itemize environmental issues, desired future and strategies for attaining that future for inclusion in the final SEA and LUP outcomes (Plates 2 and 3).

Satellite images from Google Earth provided detailed photographic evidence of the condition of Yala Wetland and its various land use changes over years. These satellite images also helped to determine the current size of the wetland in line with revised definition of the wetland in amended Environment Management Coordination Act of 2015 (GOK, 2015). Satellite images and GIS analysis have been used variously to determine land cover/land use changes (EMCA, 2015; Turner, 1998; Liverman et al., 1998; Chambers, 2006; Ampofo et al., 2015; Lillesand and Kiefer, 1987). Review was conducted on public participation, policies, laws and relevant studies that provided secondary data and a valuable source of additional information for triangulation of data generated by other means during the research and this has also been used by many researchers (Friis-Hansen and Duveskog, 2012; IYSLP, 2017).

Overall, a multidisciplinary research using case study design employed exploratory action research with both qualitative and quantitative methods of data collection and analysis. Appreciative Inquiry (AI) methodology and participatory approaches and secondary data were used in data collection and analysis (Dweck, 2008; Cooperrider et al., 1996). The secondary data included policy and legal frameworks, wetland ecosystem management guidelines and procedures, relevant studies to Yala wetland and other sensitive ecosystems elsewhere. This qualitative research was supported by quantitative methods on how contextual factors and processes affected the planning and management of Yala wetland ecosystem. Strauss and Corbin (1990) noted that quantitative and qualitative methods are tools that complement each other, while Greene (1995) demonstrated the value of journaling as research methodology for in-depth reflection by the researcher and vital in action research designs. Greene (1995) says "learning to write is a matter of learning to shatter the silences, of making meaning, of learning to learn".

The Yala project advisory committee

YPAC was the main mechanism for representing the communities of the Yala wetland in the Yala LUP. Its role was to discuss the findings of the SEA and LUP processes and content and obtain views from the wetland communities. The YPAC members were tasked to guide and instruct their own communities on the role and purpose of the LUP and SEA; to provide effective communication vertically and horizontally; to minimize misinformation and were collectively responsible for common good. It consisted of 46 members drawn from local communities and reported to the Inter-County Technical Committee (ICTC). The YPAC organ represented various interests namely ecotourism, cultural groupings/heritage; conservation; religion; islanders; fisherman; hunters; persons with disability, transporters; handicraft; farmers; investors; wildlife (honorary warden); county technical officers (lands, livestock, water, fisheries, crops, forests); sand harvesters; the youth; administration (ward, sub-county); and voluntary scout. The National Government and the County Government officers participated in YPAC meetings as observers and adjudicated on any internal disagreements

RESULTS AND DISCUSSION

Formation of Yala Wetland, its value and community involvement in its management

According to the recollection of the local communities, the swamp was a flat ground inhabited by the local people prior to the 1960s, when heavy rains caused its formation. First, before 1960s, the swamp was a water body which later disappeared allowing the local populations to move in for cultivation. They reported that Sare was a small water pool where children played football, and that in their experience, there have been three cycles of water drying or significantly reducing, namely cycle one 1917-1920s; cycle two 1960s-1970s and cycle three 1980s onwards. Further, they also reported that they had heard from their forefathers that Lake Victoria had also dried completely twice in its history of existence. This has been corroborated by studies on Lake Victoria (Awange and Obiero-Ong'anga, 2001). Second, the swamp partly formed from flooding experienced in 1960 - 1963, which they believed to be a curse from gods. They recalled that in December 1962 and much of 1963 there were heavy rains (*kodh uhuru* meaning the rain at independence) which is equivalent to today's *El Nino* rains, and that the flooding continued into the 1970s, causing malaria and other challenges that forced most people to move to high grounds. Initially, there was a small opening by the lakeside at Goye in Usenge, but with 1960s rains, it widened. A ferry was brought but with increased rains, it was swept to Mageta islands. They then used boats until the two areas were linked by a causeway. The families in Yimbo dispersed over time and some of them moved to other places in Bunyala, Alego, Gem and other far-off places. They still retain the names from Yimbo like Nyamonye, Usenge, and Uriri in Alego.

In their perspective, "Lake Kanyaboli is a mystery (*en hono*), when the water dried from Sigulu an elder, Wanjiru Kosiemo, discovered the dried land for the people of West Alego and people moved in to farm. There were a lot of indigenous fish species like *Kamongo* (mudfish) and a lot of food such that there were no thefts from the farms." An elder remembers this and states that *Ikwaloga mana ka onge,* meaning people steal food only when there is lack of it. In 1968, a road was constructed through Yala swamp, with the Lolwe bus company route passing through the swamp. The communities further explained that Lake Sare is a result of backflow of River Yala from Lake Victoria, and they attributed the expansion of the swamp to the forced diversion of River Yala's course as the waters spread into the swamp without going direct into both the Lakes Kanyaboli and Victoria as was before. The inhabitants of Mageta were driven away by tsetse fly infestation in 1929 but returned after successful government Tsetse eradication project in the islands in mid-sixties. They noted that the local communities created beliefs out of some experiences and some believed going back to Mageta was not going to be fraught with bad omen. A third community explanation on the formation of wetland was linked to the construction of Owen Falls Dam in Uganda in 1954 which they believed resulted into the beginning of backflow of water.

The Bunyala community provided an additional explanation, linking flooding to River Nzoia channel expansion for construction of Webuye Paper factory. In Musoma where River Nzoia enters Lake Victoria, there is a backflow that is partly responsible for submerging villages in the swamp. There are 10 Yala Swamp islands inhabited by 36 clans spread across 39 villages. Among the indigenous communities living in those 10 swamp islands include: Bulwani, Maduwa, Bukhuma, Siagiri, Iyanga, Khumabwa, Maanga, Bungeni, Runyu, Rukaza, Kholokhongo, Nababusu, Gendero, Mauko, Bubamba, Buongo, Siagwede, Siunga, Bunofu, Busucha, Mugasa, Isumba, Ebukani, Bumudondu, Erugufu, Ebuyundi and Khamabwa.

Therefore, it can be stated that the utilization of Yala Wetland resources has been partly informed by how the local communities perceive its formation. For those who perceived it as God's gift for them, they utilize swamp resources as their own and as such take genuine care of the resources therein. For example, they see Lake Kanyaboli and the Yala Swamp as rare fish gene bank. Additionally, it has religious and cultural values for them. The Yala Swamp is a historical site that comprises of important components of the Luo and Luhyia cultural heritage (Got Ramogi where the Luos first settled in Kenya having come from Uganda before dispersing to other parts of Kenya; Gunda Adimo (historical sites). For the Bunyala communities including 36 villages in the swamp, the wetland is their home from where they derive their entire livelihoods. Besides, their ancestors and recent family members who died have been buried there, bestowing special recognition of the spirits of their family members whom they insist they have obligation to care for. Other communities' wetland formation postulations do not support sustainable utilization of the swamp resources because they consider it a menace which causes floods and a government resource which it decides how to use without regard to the local communities; thus, requires mindset change if they have to change to support sustainable interventions for the wetland. Therefore, improvements to sustainably manage the wetland ecosystem ought to factor the historical and contextual information and mindset change among wetland communities towards the wetland. In the final SEA and LUP reports, this historical and contextual information was included as chapter 4 in the SEA report, titled understanding the Yala Swamp, recent History of the Yala Swamp that shaped final LUP plan and its implementation plan and other related ecosystem

management plans like the Yala Swamp Indigenous Conservation Area Management (ICCA) for 2019-2029.

The essential indigenous knowledge systems used by communities in managing Yala wetland ecosystem

The local communities have been managing the wetland ecosystem using various indigenous knowledge systems that promote wise utilization and concern for the other users like the government, wildlife and marine animals. For example, the communities have developed positive conservation practices by attaching defined significance to the various wildlife species: some birds are totems therefore cannot be eaten by those communities. Table 4 shows various birds and their associative conservation values as seen by wetland communities as documented from some elders who are custodians of wetland information. These valuable indigenous ecological information have been shared during Wetlands and Environment days to raise the consciousness of the rest of wetland communities so as to uphold positive attitude towards those birds and conserve them for their utility to the communities.

During the study, two relatively older members of the community (one 89 and one 78 years old) could narrate these historical events but very few young ones like (one 27 years) could. However, there was no documentation

Table 4. Name of birds in Yala Wetland and communities attached values.

S/N	LUO name	English name	Scientific name	Attached values
1	Ajul	Hamerkop	*Scopus U. Umbretta*	Predict where one can possibly marry from.
2	Akuru	Red dove	*Streptopelia Semitorquata*	Symbolizes peaceful marriage
3	Arum	Shoebill or Whale-Headed stork	*Balaeniceps rex*	A sign of bad omen, symbolizes death of an elderly person in village
4	Ochwinjo	African piled wag tail	*Motacilla aguimp vidua*	When killed the house rooftop burns (the victim)
5	Ogonglo	African open billed stork	*Anastomus L. Lamelligerus*	A sign of rainfall
6	Opija	Bam Swallo	*Hirundo R. Rustica*	A sign of rainfall
7	Achwall	Black headed gonolek	*Laniarius Erythrogaster*	Agent of seed dispersal
8	Ochongorio	Common bulbul	*Pycnonotus Barbatus*	Agent of seed dispersal
9	Hundhwe	Rupel robin chat	*Cossypha Seminara Intercedens*	Predict time
10	Chiega-tho	Red chested cuckoo	*Cuculus S. Solitarius*	Associated with rainfall
11	Orepa	Long tailed widow bird	*E Piogne delamerei*	Associate with Wetlands
12	Tula	African wood owl	*Strix woodfordii nigricantor*	Brings bad omen
13	Odwido	White Browed cuocal	*Centropus s Superaliosus*	Predicts time
14	Owuadha	Yellow wag tail	*Motacilla flara*	Associate with cows
15	Angwayo	White winged turn	*Chlidonias Leucopterus*	Indicators of fish in the lake
16	Obur ngogo	Common house martin	*Delichon U. Urbica*	Water bird
17	Nyamwenge	Africa Sacana	*Actophilornis Africanus*	Shows presence of water lilies
18	Miree	Quelea	*Quelea aethiopica*	Symbolizes good harvest

Source: Author's Interview Information (2016).

of these historical information of how the wetland communities used to manage the wetland. Therefore, there is urgent need to document and preserve this information and disseminate it to fill in the integration need for planning and management purposes of the wetland ecosystem.

The indigenous knowledge systems about Yala wetland are vital for planning and management and hence the urgent need for their preservation. The local communities have managed the swamp using various indigenous knowledge systems that promote wise utilization, concern for the other users like the government, wildlife and wetland animals. For example, the traditional totems and taboos system which are positive conservation practices arising from attaching some significance to the various animals and birds and thereby regulating their exploitation is close to the culling practice of sustainable harvesting of wildlife resources practiced in formal wildlife management. However, not every community member ascribes to these ideals hence conflicts over the wetland resources also occur. Further, the analysis showed the need for integrating local communities' knowledge and scientific knowledge in the planning and management of the ecosystem.

These indigenous knowledge systems have since been recognized and used in the implementation of LUP and other ecosystem management plans. The key environmental events such as Wetland's days,

Environmental days are currently being used to disseminate LUP plans and also being used to allocate sessions where elders share these indigenous knowledge systems. Likewise, in schools the environmental awareness and education sessions in the wetland region are also starting to incorporate these but still targeted research and documentation is needed to preserve and promote these indigenous knowledge systems.

Key environmental issues of Yala wetland ecosystem planning and management identified by Yala wetland communities

The Yala wetland communities identified key environmental issues that should inform Yala Wetland SEA and LUP development processes. The main environmental challenges identified in order of priority (from highest to lowest) were: encroachment and reclamation of the wetland by the locals for development projects; burning of papyrus (resulting in the loss of biodiversity, fish breeding grounds, bird habitats and livelihoods); high human population density; resource use and related conflicts (human and wildlife conflicts; conflicts among the local communities on boundary issues and perception of unequitable benefit sharing from Dominion Farm (Alego and Yimbo communities); conflicts between the local community, the investors, government and third parties (Non-Governmental Organisations (NGOs), Community Based Organisations (CBOs), Media); disappointment and apathy due to unfulfilled promises by Dominion Farms (subsidized rice; broken promises to pastors fellowship forum); declining water levels in Lake Kanyaboli; flooding and its negative effects; weak framework for local communities participation; incoherent implementation of wetland policies; Nile Treaty constraints on Lake Victoria catchments and River Nile waters utilization; low agricultural productivity and resultant food insecurity; threats to wetland wildlife species as large chunks of land have been taken for agriculture; birds poisoning using chemicals around Bunyala Irrigation Scheme; and pollutants channeled into the wetland; poverty and associated inequalities; and alien invasive species. All these concerns were considered in completing Yala SEA and LUP.

Causes of Yala wetland environmental challenges

The respondents identified some of the root causes of the above environmental challenges as increasing population and destruction of biodiversity; underground streams flowing back into the wetland causing flooding; high cases of malaria due to breeding zones for mosquitoes created by the wetland during rainy seasons; the drying of Lake Kanyaboli attributed to diversion of water for use by the Dominion Farms; water contamination by effluents discharged from the commercial farms, absence of proper inlet of water into Lake Kanyaboli (Figure 5); reduced rainfall due to climate change over the years; backflow of River Yala causing flooding and displacement of wetland residents; direct flow of Yala River water into Lake Namboyo causing flooding from its back flow; and intrusion into fish breeding zones by the fisher forks. These root causes were used with the benefit of appreciative enquiry to change the world view and look at the opportunities in those challenges which became the basis for their contributions on what LUP and the future Yala Wetland should look like. As Dweck (2008) notes that mindset change is key in how one views the desirable future for them to create it.

Yala wetland environmental challenges by remotely sensed data

Information from the satellite images analysis corroborates some of the above findings from communities. Detailed photographic evidence of the condition of the wetland was not available prior to 1984, but the extent of changes that have occurred to the wetland in the last 40 years could be seen with reference to historic and current aerial and satellite images provided by Google Earth. The following images (Figures2 to 9 of various dates provide a valuable record of historic land use changes in the area. Figure 2 is an image of the wetland taken on 31 December 1984. The south-eastern plain below Lake Kanyaboli (the area now occupied by Dominion Farms) appears as partially reclaimed and cultivated. However, there is no evidence of the retention dyke which was built during the 1960's separating Lake Kanyaboli and the middle area of wetland and much of the lake itself appears to be covered with either papyrus or floating vegetation.

The south-eastern plain below Lake Kanyaboli; the enlarged image shows the existence of parts of the retention and cutoff dykes, although these had fallen into disuse by the 1980's. However, the Yala River had been partially diverted at this time and flood water flowed both to Lake Kanyaboli and along the southern canal discharging into the middle swamp at a point close to Bulungo village (Figures 3 and 4).

These satellite images show very minimal change in the main characteristics of the Yala Wetland between 1984 and 1994, as revealed by a comparison of Figures 3 to 4, however towards the end of this period the image suggests that revegetation has occurred across the lower part of the area now leased to Dominion Farms. Detailed examination of the historic evidence (2001) shows that the southern diversion of the River Yala ended at a point to the north of the peninsula on which the village of Bulungo is situated (Figure 3). The original course of the

southern diversion canal can still be seen in Figure 4 with the current canal, realigned and reconstructed after 2003, marking the boundary between traditional farmland around Bulungo village and recent large scale reclamation. The wetland communities through focus group discussions, key informant interviews, community meetings and students' essays, debates and artwork feedback showed the manifestation of key environmental issues and suggested how SEA and LUP should mitigate them in the final plan. This is given in Table 5.

Multiple analysis of the historical, current and contextual information about the community participation in Yala wetland developments to date thus revealed that the wetland ecosystem has varied and critical issues that need to be considered for its sustainable management. This requires management that is sensitive to accommodate local communities' context and cultural belief systems. The historical and contextual understanding of Yala wetland and environmental issues analyzed in this study were then used to shape the final SEA and LUP reports for the management of the wetland. Further, local communities and students were able to envision the future of Yala wetland which informed the final LUP outcome.

Envisioning /Communities dream of a future perfect Yala wetland in 2063

The communities were asked to envision Yala wetland in

Figure 3. Yala wetland in 1984 and close up of the reclamation area on 31st December, 1984.

Figure 4. The River Yala discharge point into the Middle Swamp as it existed between the 1960's and 2003 (Image taken by Google 7th December 2001).

Figure 5. Yala Swamp in 1994.

2063 in their focus group discussions and community meetings. The content analysis data of the dreams and aspirations from the communities brought out a clear picture of what they would like the wetland to look like in 50 years' time. The frequencies of emerging themes were: biodiversity conservation (8%); enforceable laws

Table 5. Key Environmental issues in Yala Wetland and mitigation measures for LUP.

Key environmental Issues	**Manifestation**	**How LUP should cover/covered this to mitigate its impact based on community contribution to the process**
Destruction of important biodiversity areas	Growing pressure on papyrus due to land use change, demand for its products; declining fish stocks and species	(i) Dedicated Institutions YSSG to check on wetland changes and promote conservation of important habitats. (ii) Environmental programmes in schools and post-secondary institutions in Lake Victoria Basin (curriculum needed) (iii) Competition to sustain awareness raising on Yala Wetland threats in schools and during environmental events. (iv) Cage Culture Fishing EIA; and support in Lake Victoria (v) Promote rearing Lake Victoria endangered fish species such as cichlid (vi) Planting papyrus on degraded wetland areas; and strengthening cluster leaders on collaborative problems diagnosis and creative problem-solving skills. Upgrading private museum to community museum in Kombo beach.
Population growth	Expected rise	Job and wealth creation opportunities for the youths in different value chains in farming, Population control programs linked with environmental conservation.
Land use changes	Influx of large-scale investors	Conduct EIAs, SEAs and Environmental Assessment and ensure compliance
Weak governance systems	Under the devolved system, the governance of the wetland is unclear	LUP specific implementation structure; other institutions (KWS for the game reserve area; SSG etc. Develop governance structure that recognizes local communities' co-ownership of Yala Wetland
Benefit sharing mechanism	-Absence of guidelines for sharing wetlands benefits equitably -Lack of comprehensive information on costs of ecosystem services to guide stakeholders in its management	Quotable quotes: *Otoyo adak e samba niang to kia mit niang*" A hyena lives in a sugarcane plantation but does not know its sweetness". - Inventory opportunities of Yala Wetland and articulate these in the LUP -Develop mechanisms for equitable benefit sharing of wetland's resources (Investor/Community/Goverment70%:30% then 60%:40% Local community/County Government. Use the community shares to implement their 7- point priorities

Conflicts	Both human- wildlife and human-human conflicts are experienced in the swamp. Examples of conflicts- Gendro community and Dominions farms; Usonga communities with KWS over the game reserve gazettement of Yala swamp	Conflict management capacity enhancement among the wetland's officials. -Develop an apex governance structure that caters for the interest of all wetland communities. - Intervene and manage Usonga communities' conflict over the establishment of Lake Kanyaboli game reserve.
Declining water resources	Diversion of main river course, proposed development of multipurpose dams, expansion of irrigation, water quality is affected by population and siltation	Identification of Gongo multipurpose use dam for future development & strict adherence to EIA/SEA guidelines. Catchment protection and conservation ; Massive tree planting on farms and hills; Promote Rainwater harvesting -Regulate and charge water abstraction from the wetland by large scale and medium scale farming enterprises
Climate change	Changes in precipitation affects livelihoods as well as biodiversity	

Figure 6. Yala swamp in 1999.

and regulations to protect the wetland (7%); mechanized commercial farming with robust extension system (7%); unique habitat conserved including the one for varieties butterflies (7%); and developed recreational and tourism facilities in harmony with nature (7%).The exhaustive list of the communities aspirations that shows the frequencies of issues mentioned in the FGDs that eventually informed final LUP as shown in Figure 7.

Envisioning a future perfect Yala Wetland in 2063 by Wetland communities

Themes from school essays, debates, artworks and sermons

The results from primary and secondary schools, and post-secondary institutions on key environmental issues and their ranking for Yala LUP considerations that were analyzed from essays, artworks; and debates are shown in Figure 8 and figure 9 below. Figure 9 is a creative fusion of various artworks submitted by students into one mosaic that captures their aspirations artistically. On the these and communities' aspirations significantly informed the vision and mission and planning statements in the final Yala wetland LUP.

Some of the students creatively envisioned Yala wetland using artworks and these were further collapsed into the following mosaic (Figure 9).

The Yala wetland communities used transformational learning methodologies to reflect and act upon their world in order to change it to future aspiration. This changed world view became the basis for their inputs in the Yala Wetland LUP. The Community Facilitator (CF) inducted the wetland communities on the application of opportunity-based view/lenses through appreciative inquiry methodology and empathy walk which they adopted and used to generate their inputs into the plan. The broader wetland community representation through CF intervention enabled local communities to envision, dream, and articulate their aspirations of the future Yala Wetland using possibility-based mindset and eventually provided for wider ownership for the sustainable Yala wetland. All their perspectives were incorporated in the final SEA and LUP reports and depicted in the final Yala Land Use Plan (Figure 10).

Final Yala Delta land use plan

The planning process took over two years (2016-2018) and with enhanced community participation provided by the action research interventions as discussed and finally recommended three main land uses namely: Conservation Areas, Agricultural Areas and Settlement Areas as shown in Figure 10.

Governance framework for Yala wetland ecosystems management

The local communities had participated in the management of the Yala wetland in various ways alongside other actors. They had done this through their community-based organizations, through chiefs' meetings/open public gatherings, religious groups/networks, schools and cooperative societies. The attendance of some of these meetings had been

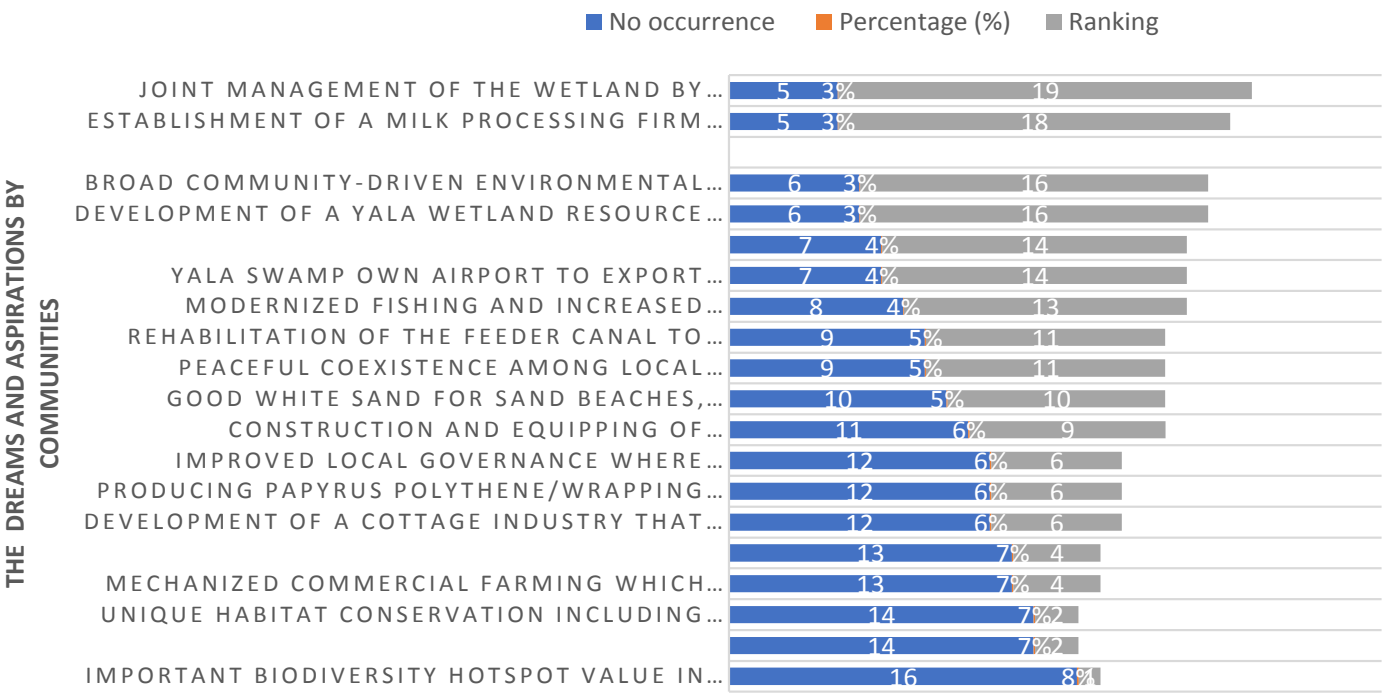


Figure 7. The qualitative analysis of the dreams and aspirations from the communities.

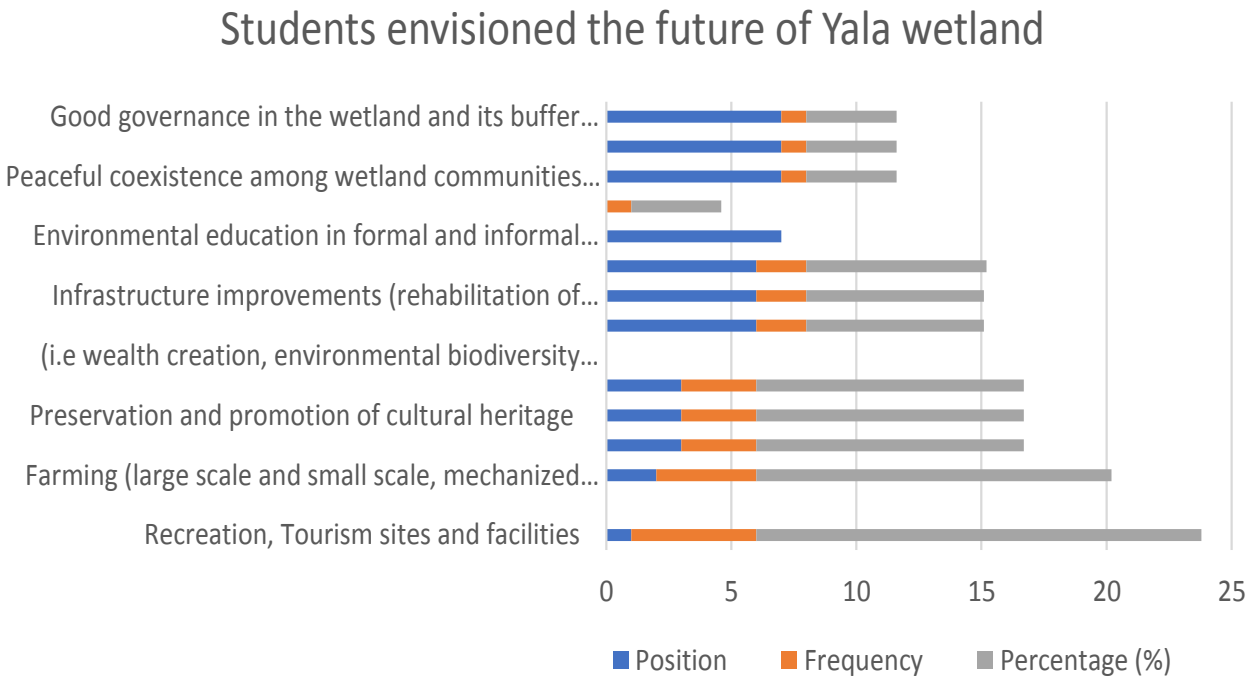


Figure 8. Key environmental themes from learning institutions essays and debates.

determined by the relationship between individuals and meeting convenors. Political players which included local members of parliament and civic leaders were found to dominate key decision making on the wetland as

Figure 9. Mosaic about the future Yala Wetland from institutions' artwork.

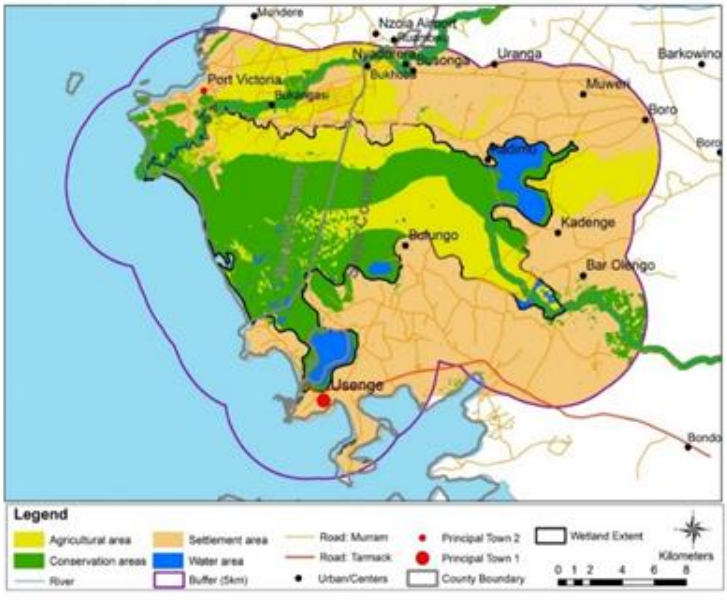


Figure 10. Zonation of Yala Delta.
Source: Odhengo et al. (2018b).

evidenced in the decision to lease part of the Yala Wetland to Dominion Farms Limited, which was made solely by the political class through the then local authorities (county council and district development

committees), without any reference to the local communities. Likewise, communities had been consulted (at information level of spectrum of public participation) without them having substantial stake in the management of Yala Wetland through existing community formations and religious groups.

Further analysis revealed that there had been no Yala wetland wide institutional framework where communities' wetland ecosystem issues were discussed and channeled for decision making in the management of the wetland ecosystem. Rather, small group community formations such as CBOs, sector specific groups that

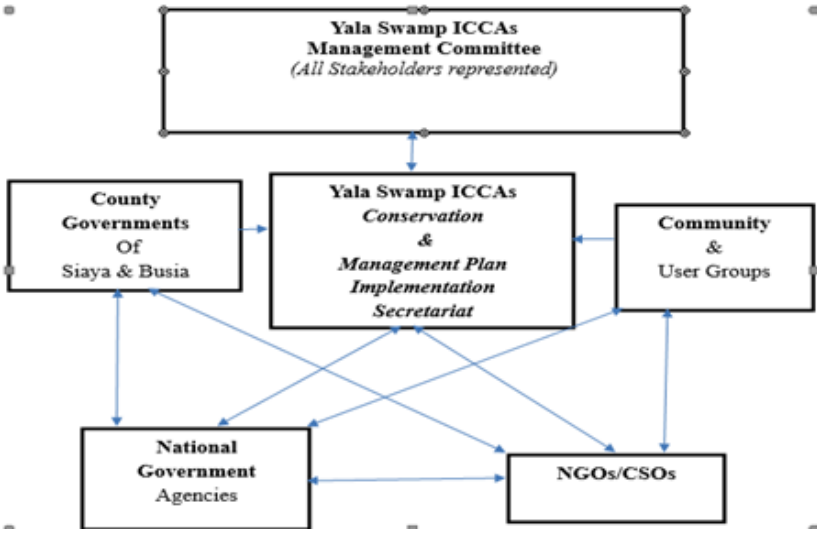


Figure 11. Governance structure of managing Yala wetland ecosystem conservation areas.

lacked the larger wetland clout to influence key environmental decisions had been the norm. Instead, political players had dominated key decision making on the wetland ecosystem issues and decision done solely by the political class. This gap for community participation in the management of Yala Wetland ecosystem affairs had continued over time despite significant increase in wetland challenges. In order to remedy this, the wetland communities through action research processes proposed a governance system that has wetland-wide representation and provides a structure for communities' participation at Conservation Areas Zone of the wetland. It is named Yala Swamp Management Committee. This governance structure has been validated and adopted by the community representatives from the wetland at the development of Yala Indigenous Community Conservation Areas Management Plan 2019-2029 in March 2020 and November 2020 (Figure 11).

The committee that has 47 members as shown in Table 6 has been derived from various community groups representing different interests namely County Village Natural Resource Land Use Committees (VNRLUCs), Inter-County ICCA Steering Committee, Yala Ecosystem Site Support Group members (YESSG), Civil Society organizations (CSOs) guided by fair ecosystem and equity-based representation between Busia and Siaya Counties. Strategically, provides for co-option of 3 members to bring some unique value addition to ICCA such resource mobilization leverage. In addition, technical staff from the various county and national government sectors and other agencies (e.g. Agriculture, Fisheries, Tourism, Wildlife) will be co-opted in the committee as need arises. The Yala Swamp Management Committee shall provide strategic leadership, mobilize resources, provide oversight on conservation areas' programs implementation. The membership is from the conservation area zone of the Yala Land Use plan initially, but other zones (i.e. Settlement and Agricultural), would join too. The 11-point committee's roles and responsibilities have been spelt out and are adequate to deliver their Yala Wetland Conservation Management Plan 2019-2029 adopted in November 2020. This governance structure has put wetland communities at the core for managing Conservation areas of Yala Wetland Ecosystem which has been their ultimate desire; being co-owners and co-creators of the sustainable Yala Wetland ecosystem. This governance structure is also compliant with provisions of the Kenya Government Wildlife Conservation and Management Act of 2013.

CONCLUSION AND RECOMMENDATIONS

From the foregoing, it is evident that the utilization of Yala Wetland resources has been partly informed by how the local communities perceive its formation. Some propositions that see is it as God' gift support

conservation interventions whereas other propositions do not and consequently lead to unstainable utilization of the wetland resources. Therefore, improvements to sustainably manage the wetland ecosystem ought to factor in Yala Wetland historical and contextual issues and a deliberate mindset change. There existed gaps in integration of community ecological knowledge and scientific information, a disconnect between decision making and requisite scientific and practical evidence required to guide wetland management decision making, and absence of community sensitive Yala Wetland wide institutional framework for managing the Yala ecosystem.

Table 6. Yala swamp ICCAs management committee membership.

Position	Number
Representatives from each of the 5 CCA cluster sites i.e. Kanyaboli-2, R. Yala corridor-1, Lake Namboyo-1, Lake Sare-1, Bunyala Central-1, Bunyala South-2, Islands-2	10
Beach Management Unit-Alego Usonga BMU Network-1, Bondo BMU Network-1, Bunyala-1	3
Farmers (Small holder farmer and Commercial farmer)	4
Water Resources Users Association-MUWERI-1, Lower Nyandera-1, BUCAWRUA-1	3
Community Forest Association	2
County Wildlife Conservation & Compensation Committee-Siaya-1, Busia-1	2
Sand Harvesters Association-from the coalition of Sand Harvestors Association	2
Community Warden/scouts	2
Community tour guides association	2
Handicrafts (papyrus, palm leaves weavers)	2
Medicinal gatherers/Herbalists	2
Cultural/religious groups	2
Traditional conservationists (formerly hunters)	2
Representatives from the County Environment Committee	2
Civil Society Organization/Network	2
Private Sector/Network	2
Coopted members (including strategic and conservation friends committed to ideals of ICCCA and as agreed by the ICCA management committee.	3
Total	**47**

Wetland communities validated community committee member where the 47 positions will be shared based on fair representation and equity between Busia and Siaya Counties.
Source: Author (2020).

Furthermore, this action research has succeeded in assessing the missing links for effective community participation in Yala SEA and LUP and eventual sustainable management of the Yala wetland ecosystem. Specifically, by integrating local communities' vast knowledge and planning information using the community facilitator and information resources hub as the linkage and developed a governance structure and membership for the management committee that put communities at the centre of conservation in Yala wetland, starting with Community Conservation Areas. To overcome the implementation challenges, it has designed is a secretariat led by a Community Facilitator to undertake day to day activities of implementing the Conservation Area Management Plan of the Yala wetland. It not only calls for, for a strong, passionate and transformational leadership at the community level on wetland issues but also the urgent systematic documentation and preservation Yala wetland local communities' knowledge systems and subsequent use in managing Yala wetland ecosystem. All these have since been incorporated in the LUP processes and reflected in the final Yala Delta Land Use Plan and ICCA Management Plan 2019-2029.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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