

## **An Assessment of Causes of Conflicts Over Common Pool Resources Among Residents of Lower River Nyando Floodplains, Kisumu County, Kenya**

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**Abstract:** Common pool resources like forests, wetlands, water, and rangelands are a major source of livelihood to the rural poor and less fortunate members of the community, and denial of access to such resources always cause conflicts. Several studies have been done on such conflicts between different communities on one hand, and between states and particular communities on the other hand. Conflicts have occurred among different user groups among the residents of Lower River Nyando floodplains, an area occupied by a homogeneous community fighting over land, water, papyrus and fishing. However, no research has been carried out on common pool resource conflicts among residents of Lower River Nyando floodplains. This study focused on causes of conflicts over common pool resources among residents of Lower Nyando River floodplains, Kisumu County, Kenya. The objectives of the study were to assess the causes of conflict over water, land, fish, and papyrus. Descriptive research design was adopted, and interview schedules were used to interview purposively selected 138 respondents. The instruments were pilot tested and Cronbach's coefficient alpha yielded a reliability coefficient of 0.76 which was acceptable. Chi-Square at  $p=0.05$  was used to analyse data gathered from the field. Statistically significant relationships were found between access to fishing ( $\chi^2=15.473$ ), papyrus ( $\chi^2=15.563$ ), and land ( $\chi^2=18.67$ ), and conflict among the residents of lower River Nyando floodplains. However, no relationship was found to exist between access to water ( $\chi^2=3.958$ ) and conflict. It was concluded that common pool resources like land (for cultivation), water (competition between fishermen, farmers, and livestock keepers over water), fishing (theft of fishing gears and caught fish) and exploitation of papyrus are the main causes of conflict in this study area.

**Key Words:** Conflict; Causes of conflict; Common Pool Resources; Flood Plain; Livelihood.

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## I. Introduction

Common pool resources such as rangelands, forests, fallow fields and ponds provide an array of social and economic benefits for a wide variety of users in arid or semi-arid lands and wetlands (FAO, 2004), and the products obtained from such resources have been critical elements in the livelihood and survival of these communities, particularly in times of drought. Unlike pure public good, common pool resources like irrigation systems, fishing grounds, pastures, forests, water or the atmosphere face problems of congestion or overuse.

Studies that have been done globally on conflicts over common pool resources have established significant relationships between access to such resources and explosions of conflicts (Environmental Literacy Council) (ELC, 2002). A number of violent conflicts have erupted over the abundance of resources like those in Sierra Leone, Congo, Liberia, and Angola over diamonds (Armitage, 2008). Interaction between communities and their nearby wetlands for socio-economic resources have in most cases resulted in the exploitation of the latter, consequently posing serious threats to the survival of these ecosystems and consequently other parties who rely on these resources (Olson, 2006). The overexploitation usually results in environmental degradation and suffering for humans and animals. One natural resource that will be a likely source of major conflict is water as many of the world's major rivers cross national boundaries (Kok et al. 2009). There have been conflicts between Nations like those of Ethiopia and Sudan over Nile waters, Senegal and Mauritania over the damming of River Senegal, and Kenya, Uganda and Tanzania over fishing rights in Lake Victoria.

However, conflict over the natural resources that underpin rural livelihoods in agricultural landscapes like the subsistence use of land, water, fisheries, and forests has received far less attention from the environmental security community, (UNEP 2009; UNDP 2010; Kapur et al. 2012; Young and Goldman 2013). Conflict over nonrenewable resources is in many respects a zero-sum game; that is, while the

benefits from gem mining, for example, can certainly be more equitably shared, the underlying resource is finite. By contrast, renewable resources offer more direct opportunities for collective gains through cooperation and collective action, as stewardship of the resource base can increase productivity, thereby “expanding the pie” for multiple actors.

Although conflicts over common pool resources had been recurring, no study has been conducted in the lower River Nyando floodplains to determine the connections between common pool resource exploitation and conflict. Institutions such as Lake Victoria Research Institute (VicRes), Lake Basin Development Authority (LBDA), Lake Victoria Environmental Management Programme (LVEMP), and Friends of Lake Victoria (OSIENALA) among others had concentrated on the development potential, opportunities and challenges of the floodplains with little focus on conflicts. Therefore this study sought to assess the causes of conflicts over common pool resources among the residents of lower river Nyando floodplains.

## II. LITERATURE REVIEW

Common pool resources like irrigation systems, fishing grounds, pastures, forests, water, land or atmosphere (VicRes, 2008, Rees, 1985, Baran, 2011) are a common source of conflict due competition over users’ access by households living in rural and poverty prone areas. Access to these resources means the difference between an adequate diet and malnutrition; while for others it is a means to invest in children’s education, and a route out of poverty (Sunderlin et al. 2005; WRI 2005). This is because the consumption of the Common Pool Resources (CPR) by one agent implies that less is available for others hence creating competition which results into conflict. Hardin’s (1968) classic essay on the tragedy of the commons points out the hazards of open access, without stating clearly that the problem was the lack of a property rights or management regime (the openness of access), not the sharing of use (common use). Thus, common property is not access open to all but access limited to a specific group of users who hold their rights in common (Blomley *et al.*, 2010). They are about social and cognitive boundaries, (Schlee, 2004). While there is

relatively free but monitored access to the resource system for community members, there are mechanisms in place which allow the community to exclude outsiders from using its resource (Blomley *et al.*, 2010).

Southgate & Hulme (2000) investigated the impact of exclusion of the indigenous communities from entitlement of the Kenyan highlands by successive regimes, and concluded that this (exclusion) has contributed to perennial tribal conflicts in Kenya, ostensibly because the rights of the communities which had been accessing the CPRs have been ignored. However, to minimize such conflicts, recent decades have witnessed a rising movement to protect and extend the rights of local communities to access and exploit forests, fisheries, and rangelands, notably through community-based management (Allison *et al.* 2011; Mwangi 2009; Tole 2010). Effect of climatic change (like droughts) on competition over common natural resources like water and grazing space was investigated by Brigitte Thèbaud (2002) in Niger. Her study revealed that croppers and grazers coexist under very tense situation in this region, which frequently breaks into physical conflicts. So *et al* (2011) researched on conflicts over resource competition among the fishing communities in Cambodia. His study found out that conflict over illegal fishing by local residents as well as seasonal migrants; competing uses of water and land in the floodplain zone and the potential impact of new infrastructure, particularly dams have occurred frequently ever since the government of Cambodia made a move to reduce the extent of common-pool fisheries resources available for large-scale, commercial exploitation in favor of community access (Cambodia New Vision, 2011, 3; Nang *et al*, 2011).

In Kenya, population pressure has led to competition and conflicts over the use of scarce natural resources among the residents of Lake Victoria Basin (Ong'ang'a, 2005) just as has been witnessed among the grazing communities like the Masaai and the Pokot. The overall consequences of these pressures are greater demands on the physical environment, and its eventual degradation, as argued by Blaikie (1987) in his analysis of soil erosion. Literatures reviewed affirm that there is a relationship between resource exploitation and conflict over common pool resources. This study

was set to investigate the causes of common pool resource conflict in lower River Nyando flood plains, in the borders of Nyakach and Nyando Sub Counties, Kisumu County, Kenya.

### III. METHOD

#### Study Area

Administratively, Lower River Nyando Flood Plains is found in Lower Nyakach and Nyando divisions (GoK Development Plan, 2002-2008). The area is served by two rivers; Nyando and Awach, which during heavy rains cause floods in Lower River Nyando Flood Plains. Under normal circumstances, however, the two rivers provide water for rice growing by irrigation.

Soils and climatic conditions of the study area are suitable for sugarcane growing in Muhoroni, Miwani and parts of Nyando Division. Sugarcane therefore forms the main cash crop in the district. The swamps along rivers Nyando and Awach in Nyando and Lower Nyakach are best suited for rice growing under irrigation. The level of access to safe drinking water is another issue of great concern. Climate change normally increase the frequency of extreme flooding and drought, bringing increased investment in water control infrastructure along with challenges to fishing and farming communities negotiating competing uses of water in the dry season (Ministry of Environment of Cambodia and United Nations Development Programme 2011). The area experiences between 800 to 1200mm of rainfall annually (Onyango et al, 2007).

The other extreme condition is drought when people have to walk long distances in search of water or rely on unsuitable water from ponds which is shared with livestock (Walsh et al., 2004), and suffers serious land degradation, estimated 40 – 70t/ha/year soil loss. The agriculture sector is not performing to the required level, resulting in low overall food production, and the Sub County has to rely on food imported from outside to supplement locally produced food,(Central Bureau of Statistics-CBS, 2004). After the collapse of the cotton industry, cotton growing was abandoned by farmers thus worsening income levels. In terms of livestock, the area

relies on traditional animals instead of improved ones that would be more economical to the district. Due to poor farming practices coupled with lack of concern for tree planting, the area is suffering from soil erosion and environmental degradation. Fishing as a source of food and income was affected by the invasion of the water hyacinth. This study was conducted in two locations namely: Wawidhi and North Nyakach. In North Nyakach location, the study was conducted in Gem Nam and Gem Rae sub-locations; while within Wawidhi location, the study was conducted in Magina, Kakola and Kochogo sub-locations. Majority of the inhabitants in these areas are of migratory background, thereby enhancing the politics of belonging and sojourner; one major cause of inter clan tension (Kopytoff 1987, Chauveau, Jacob & Le Meur 2004, Kuba & Lentz 2006). Figure 1 shows the map where the study was conducted.

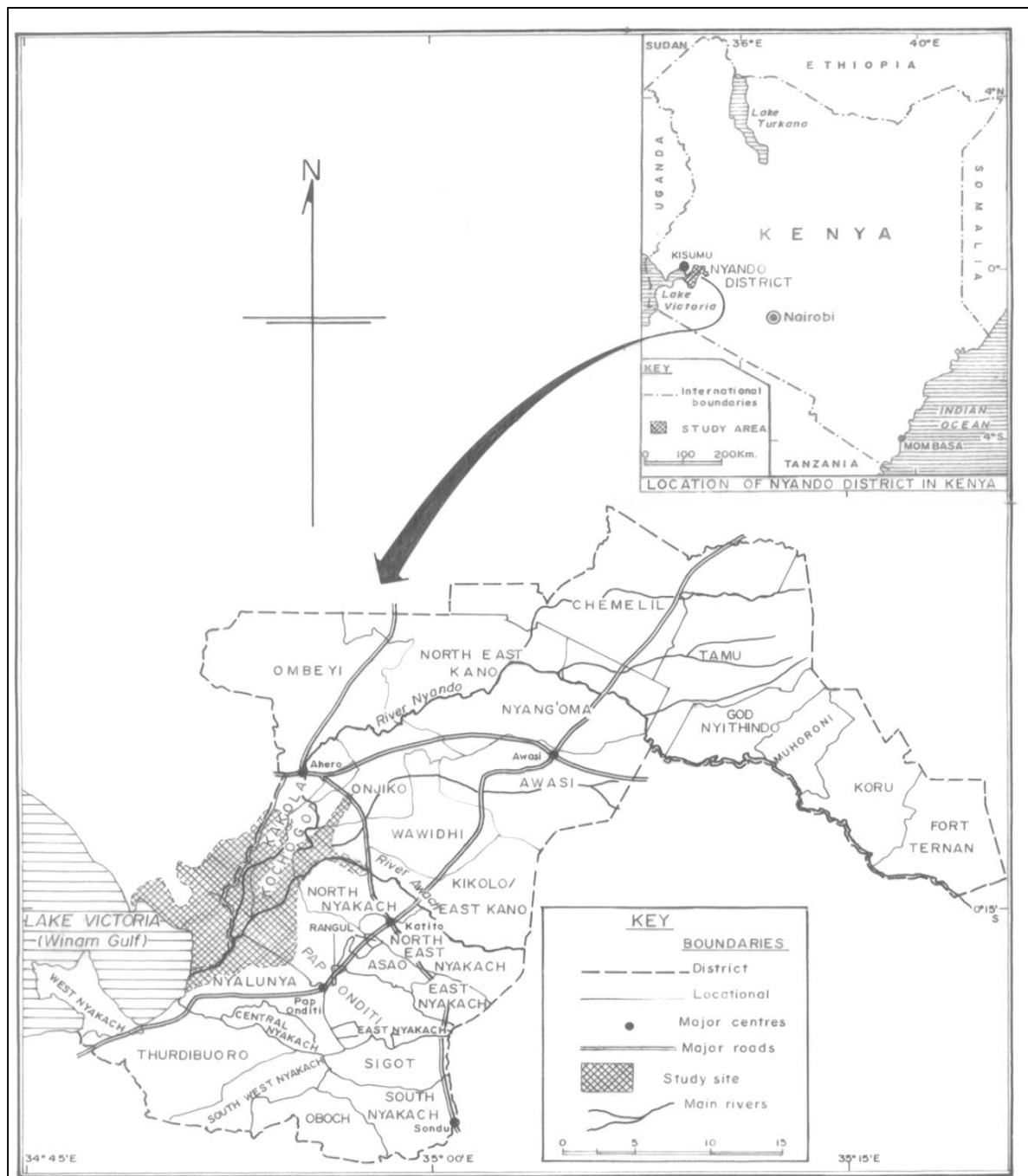


Figure 1 Map of the Study Area

Source: Cartographer Egerton University 2010

### ***Study Population, Sampling Procedure and Data collection***

Stratified and purposive random sampling techniques were used to select 138 respondents from the 6370 households. In purposive sampling espoused by Mugenda and Mugenda (2003), the researcher's judgment in selecting the respondents from whom data is to be collected is acceptable.

This study used interview schedules to gather the necessary data from the heads of households sampled from the families living within the study area. Administration of interview schedules allowed the researcher to make clarifications on questions not clearly understood by the respondents.

Instruments used to collect the required data were pilot tested in Ombeyi sub-location far away from the area under study since it had similar characteristics. The instruments yielded Cronbach's reliability coefficient alpha value of 0.76. From the attached map, Ombeyi sub-location is far from the areas under study and this reduced the effect of contamination. The reliability and validity of the instruments were obtained through checking for representativeness of data, checking for bias due to observer bias or the influence of the researcher on the research situation, cross-check data with evidence from other independent sources and comparing and contrasting the data during the stage of qualitative investigation on the conflicts. Through pilot testing, the instruments were reorganized and some parts deleted so as to get a working instrument. The final instrument obtained was the one used to collect the required data.

### *Data Analysis and Results Presentation*

Based on the research instruments and data collected, data was organized, processed and analysed using both inferential and descriptive statistics. In the field, the researcher ensured that questions were answered correctly to give accurate information. The researcher was therefore keen to find out how the people of lower River Nyando floodplains were responding to the questions asked according to the study objectives. Data was coded by assigning numerical values to the qualitative data for analysis. According to Charmaz (1983), the disassembling and reassembling of data occurs through the coding process. Researchers therefore use codes to pull together and categorise a series of otherwise discrete events, statements and observations which they identify in the data.

This study used descriptive statistics (tables, pie-charts, frequencies and graphs) to organize and describe the sampled population. Chi-Square was used in making



conclusions about data from the sampled population. Data was processed on computer using Statistical Package for Social Sciences (SPSS).

#### **IV. Results and Discussions**

##### **Water Resources and Conflict**

The chi-square ( $p > 0.05$ ) indicated that there was no significant link between availability of water as a common pool resource and conflict over it. Part of the reason why mere availability of water had no significant link with conflict over it was that it is considered that water as a common pool resource is both abundant and adequate. It must, however, be pointed out here that the manner in which water was used to pursue other means of livelihood such as farming through irrigation and livestock watering was the main cause of conflict over it. Many respondents felt that the use of water to the exclusion of others was to blame for conflict as denied other users access to it. Aspects of water use that respondents noted triggered conflict were diversion of water from its natural course, excessive irrigation, restricted access and pollution arising from agricultural activities. Farmers and fishermen were the most concerned that water was actually a cause of conflict. Livestock keepers were not so much bothered, most probably due to the fact that the area was not known for large herds of cattle that might need a lot of drinking water. Although papyrus users were least bothered since only a few of them considered availability of water as a possible source of conflict, it must be appreciated that papyrus grow along the river banks and lake shores. Therefore continuous depletion of water resources ultimately led to reduced availability of papyrus and related resources. This resonates with Jacob's (2003) and Le Muer's (2006) conclusions that conflict is about contesting and negotiating a compromise on equity between different levels or communities of belonging (household, lineage, village, ethnic group, national level). In this case, different users of water within Lower Nyando River floodplains understand and appreciate the importance of including every user in accessing the CPR.

Table 1: Availability of Water and Conflict

		Resource Users				
		Farming	Grazing	Fishing	Papyrus	Total
<b>Conflict over Water</b>	Yes	43	13	33	20	109
	No	06	07	08	08	29
Total		49	20	41	28	138

$$\chi^2 = 3.958, df = 3, p = 0.412$$

### Land Resources and Conflict

Chi-Square Value ( $p < 0.05$ ), which prompted the rejection of null hypothesis indicating that there was a positive significant relationship between the availability of land as a common pool resource and conflict over it. As can be observed from table 2, farmers were the most worried over the fact that the availability of land could be a source of conflict. The entire land of lower River Nyando floodplains for a long time had been under rice farming. Conflicts between livestock keepers and agriculturalists had also been witnessed in recent years. Crop and horticultural farming had been done in virtually the entire land, leaving no space for grazing lands. The conflicts were normally tense during dry seasons. Similar conflicts occurred in Uganda when Balalo pastoralists in search of grazing land and water moved to areas in other regions like Teso, Kayunga, Kiboga, Sembabule, Apac and Mpigi districts. Their behaviour and way of life of trespassing people's land and destroying crops created tension and insecurity (MAAI Report 2007). The bloody clashes between the different communities and the two nomadic groups of Balalo and Basongora pastoralists has highlighted the country's long unresolved conflicts relating to CPRs. Table 2 below illustrates the relationship between availability of Land and Conflict.

Table 2: Availability of Land and Conflict

		Farming	Grazing	Papyrus	Total
Conflict over land	Yes	82	16	17	118
	No	12	06	05	20
Total		94	22	22	138

$$\chi^2 = 18.676, df = 2, p = 0.000$$

### Fishing Resources and Conflict

Fishing has remained a source of income and food for communities around the lake for a long period of time. In this study, farmers were the most concerned that the availability of fishing resources could cause or trigger conflict. Farmers and fishermen generally depend on water as a common pool resource for their activities. Therefore although they differ in terms of sources of livelihood, they compete for the same resource-water- for pursuit of livelihood. Livestock keepers as well as users of papyrus and related resources also depend on water, however, competition between them and fishermen are thought to be less intense compared to that between farmers and fishermen. This implied that any conflicts arising over fishing resources could be linked to either their scarcity or inadequacy and to the criminal activities such as theft and blockade of access to fishing points. Majority of the respondents who reported that conflicts arose over fishing resources due to limited access to fishing points and theft of fishing gears. This could be the reason why scholars of commons have focused primarily on producing case studies of successful community management of coastal fisheries, forests, pastures, irrigation, and ground water (Ascher 1995, McCay & Acheson 1987, Peters 1994, Tang 1992). Their work, in conjunction with other writings on participation, indigenous knowledge, and political ecology, has encouraged resource co-management programs by governments. Co-management programs assign local communities shares in control over and benefits from renewable resources (Agrawal & Ribot 1999).

Table 3: Fishing Resources and Conflict

		Resource Users							
		Farming		Grazing		Papyrus		Total	
		F	%	F	%	F	%	F	%
Conflict over Fishing	Yes	46	33	31	22	17	12	94	68
	No	19	14	17	12	08	06	44	32
Total		65	47	48	35	25	18	138	100

### Papyrus and Related Resources and Conflict

This study established that there was a significant relationship between availability of papyrus and related resources and conflict over them. Table 4 shows a chi-square value ( $p < 0.05$ ), leading to the rejection of null hypothesis. The relationship between availability of papyrus and conflict was a positive one. Availability of papyrus as a possible source of conflict appeared to bother farmers and fishermen more than other users of common pool resources. This finding is similar to one found out in Cambodia with three forest-dependent communities, where more than 98 percent of households engaged in forest-related income-generation activities, and these sources of income were found to be especially important during the rainy season when rice and vegetable crops are not harvested—an important contribution to food security (Ra et al. 2011). Farming activities sometimes encroached into papyrus fields during dry seasons, a scenario that is bound to create tension between papyrus users and farmers. This may account for the fact that farmers were the most concerned that availability of papyrus could lead to conflict because they (farmers) fear that in the event of drought, papyrus infested wet areas would be ideal for cropping. Fishing activities is also interfered with more when harvesting of papyrus is done at fishing points, or areas known to have large stocks of fish. During dry seasons, animals are

also taken to the lake shores for grazing. This either interferes with growth of papyrus or animals may stray on papyrus that have been left to dry. This perhaps could be what makes livestock keepers concerned that the availability of papyrus could be a source of conflict in the study site.

Table 4: Availability of Papyrus and Conflict

		Resource Uses			
		Farming	Grazing	Fishing	Total
Conflict over papyrus	Yes	59	18	41	118
	No	05	06	09	20
Total		64	24	50	138

$\chi^2 = 15.563$ ,  $df = 2$ ,  $p = 0.001$

## V. Conclusion

Interpretation and analysis of data collected from interview schedules show that the main resources that residents of lower River Nyando floodplains have conflicts over are land, water, fishing and papyrus resources. Conflicts over water are always as a result of diversion of water channels by some residents. The issue of land is a challenge due to fights over grazing areas, destruction of crops by livestock and theft of crops. The ever-increasing population means that the available land is subdivided thereby reducing the areas originally set aside for grazing the animals. There are also constant fights over boundaries especially when it comes to harvesting of papyrus and related resources. Conflicts over fishing have always been associated with people whose lifeline is water and fish therein. The conflict they have is usually over fishing areas and theft of harvested fish and fishing gears. There are also constant fights over boundaries especially when it comes to harvesting of papyrus and related resources. This is due to the fact that there is no legitimate ownership of the floodplains on one hand, and the context of resources (CPRs) existing in the floodplains. Ostrom (2005) and Poteete *et al* (2010) explained that when resources are

not dispersed but concentrated within a small location, conflicts abound out of over exploitation by some parties against preservation steps undertaken by others. This is irrespective of the monitoring and regulatory advantages that concentrated resources (CPRs) enjoy.

### **Acknowledgements**

The authors are most grateful to all the residents of lower River Nyando floodplains for their responses during data collection process. We are equally indebted to the provincial administration, Sub County Education Officers and elders of both Nyakach and Nyando Sub-Counties whose contributions were very invaluable to the study.

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