

## *Kenya-Tanzania Conservation Synergy for Migratory Lesser Flamingoes*

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The IAFOR International Conference on Sustainability, Energy & the Environment –  
Hawaii 2018  
Official Conference Proceedings

### **Abstract**

Every year, about 850,000 flamingoes migrate between Kenya's Lake Nakuru and Lake Natron in Tanzania. In 2008, the Kenya National Single Species Action Plan for the Conservation of the Lesser Flamingo began to effectively conserve the lesser flamingoes in Kenya. However, good cooperation and institutional synergy between Kenya and Tanzania are essential for the success of this plan. Who would take up this task, however, is not yet clear. The Kenya Wildlife Service, which mainly undertakes wildlife conservation activities, is not prepared for establishing transboundary conservation actions for migratory birds. The East Africa Regional Lesser Flamingo Network has attempted to share action plans and information about conservation status with relevant countries. In order to foster this synergy, we argue, Kenya and Tanzania need to fully implement and comply with relevant environmental conventions and laws, strengthen and harmonize wetland and water bird legal frameworks, and promote research and data sharing about the lesser flamingoes.

Keywords: Lake Nakuru, Lake Natron, Lesser flamingo, Migratory birds, Transboundary synergy, Ramsar sites

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## Introduction

This paper explores the challenges to establishing a Kenya-Tanzania transboundary conservation synergy for the migratory lesser flamingoes (*Phoenicoparrus minor*). These two countries play significant roles in protecting this species as they provide habitat to at least 77% of the world's lesser flamingoes. Recently the population has been declining (Table 1) partly due to habitat loss and lack of effective collaboration for its conservation (Nasirwa, 2000; Birdlife International, 2012a).

In Kenya and Tanzania, the protection of these birds and the habitat conservation differ considerably. In Kenya, the lesser flamingo habitats are protected areas, but in Tanzania they are either partially protected or not protected (Childress et al., 2007). This paper mainly focuses on Lake Nakuru in Kenya, an important single forage site for about 850,000 flamingoes (Nasirwa, 2000) and Lake Natron in Tanzania, the single most important regular breeding site for 1.5 to 2.5 million flamingoes (BirdLife International, 2016; Childress et al., 2007).

Flamingoes are the main tourist attractions at Lakes Nakuru and Natron. Lake Nakuru National Park is one of the most visited parks in Kenya with approximately 245,000 tourists annually (Nyunja, 2012). Through tourism, the lesser flamingoes contribute about US\$26 million in Kenya and US\$1 to 5 million in Tanzania (Wildlife Division, 2010). Therefore, a threat to lesser flamingoes and these two key habitats will possibly affect tourist revenues (BirdLife International, 2012a).

### *About the lesser flamingo*

The lesser flamingo population was estimated to be in the range of 1,960,000 to 2,980,000 (Wetlands International, 2012), and they have been listed as a near threatened species on the IUCN Red List (BirdLife International, 2016). About one to two million lesser flamingoes breed in Lake Natron (Childress et al., 2007). The lesser flamingoes thrive in shallow and highly alkaline lakes mainly in the eastern Rift Valley, such as Lakes Bogoria, Elmenteita and Nakuru in Kenya and two others at Manyara and Natron in Tanzania (Childress et al., 2007; Nasirwa, 2000). They migrate as a group between these alkaline lakes. A tracking survey in Kenya indicated that in a span of fifteen months, the birds made up to 70 visits to as many as 11 lakes in Eastern Africa (Childress et al., 2007).

Table 1. Estimated global population of lesser flamingoes

| Regions         | Minimum   | Maximum   | Status    |
|-----------------|-----------|-----------|-----------|
| Eastern Africa  | 1,500,000 | 2,500,000 | Declining |
| Southern Africa | 55,000    | 65,000    | Stable    |
| South Asia      | 390,000   | 390,000   | Unknown   |
| West Africa     | 15,000    | 25,000    | Stable    |
| Total           | 1,960,00  | 2,980,000 |           |

Source: Wetlands International, 2012

Every year, about 850,000 flamingoes migrate from Lake Nakuru to Lake Natron for breeding. According to the Kenya Wildlife Service experts, they migrate between August and September to Lake Natron. The peak period of breeding is during the months of October to November. They migrate back to Kenya around February to April. The migration period is largely determined by hatching period (Elowitz, 2015).

## **Lake characteristics**

### *Lake Nakuru*

Lake Nakuru is located inside Lake Nakuru National Park. This Park of 188 km<sup>2</sup> is situated at 0° 24'S and 35° 05'E in the Great Rift Valley of Kenya. The Park is situated roughly 3 kilometers south of Nakuru town (Gichuhi, 2008). It provides habitats to 450 bird species, 56 mammal species and 550 plant species (KWS, 2017; Nasirwa, 2000). The Park is surrounded by electric fences and regularly monitored by armed rangers mainly to protect wildlife.

Lake Nakuru has a surface area of about 45 km<sup>2</sup>. The mean depth of this closed Lake is 2.5 meters (maximum 4.5 meters). It is also highly alkaline with a water pH of about 10 (Odada et al., 2006). Lake Nakuru is commonly known as “the Bird Watchers’ Paradise” (KWS, 2017) as it is home to thousands of flamingoes (Gichuhi, 2008). The Lake was designated as the conservation area in 1957 and the bird sanctuary in 1960. A year later the Lake and its surrounding area were set aside as a national park (Odada et al., 2006; UNESCO, 2017). Its water sources include Baharini Springs and five seasonal rivers (the Njoro, Nderit, Makalia, Naishi and Larmudiak rivers) (Gichuhi, 2008).

### *Lake Natron*

Lake Natron, a soda lake, is located at 02° 21'S and 25° 00'E in northern Tanzania near the Kenya-Tanzania border. Lake Natron is a closed basin with approximately 930 km<sup>2</sup> of the surface area. The Lake has a shallow basin with a maximum depth of 2 meters. It is highly alkaline with an average water pH of 12. The Southern Ewaso Ngiro River that rises from the Mau Forest catchment in Kenya primarily feeds the Lake. Other three small rivers, the Ngare Sero, Moinik and Pinyinyi, also run into the Lake (Ramsar, 2001).

Lake Natron is the single most important breeding ground for lesser flamingoes in the world. Approximately 1.5 to 2.5 million of them breed here. The Lake also has about 30% of the world's population of the threatened chestnut-banded plover (*Charadrius pallidus*) (BirdLife International, 2012a). Due to its importance it was listed as a Ramsar site and as an important bird and biodiversity area (Ramsar, 2001)

The pastoralist communities largely inhabit the Lake Natron Basin. About 95% of them belong to the Maasai tribe. Livestock, their main livelihoods, largely depends on the Lake Natron ecosystem. They also supplement their incomes through small farm irrigation and tourism (BirdLife International, 2012a).

## **Threats**

### *Soda Ash Mining in Tanzania*

One of the major threats to lesser flamingoes is a plan to mine soda ash in Lake Natron. In 2006, the Tanzanian government developed a plan to set up a soda ash factory at the Lake. The factory was expected to bring a net income of US\$480 million. The National Development Corporation's research indicated that the mining of soda ash would not have any negative impacts on the breeding of lesser flamingoes (BirdLife International, 2012a).

However, many raised concerns about this plan. Some said that the disruption to the breeding site would occur as a result of water pollution and the usage of heavy machineries. It was estimated that 129,000 liters of fresh water per hour would be required to run the factory. This would threaten water security in this semi-arid region. Others feared that the factory would negatively affect local communities' livelihoods that directly depend on Lake Natron (BirdLife International, 2012a).

In 2007, the BirdLife International and Lake Natron Consultative Group launched the "Think Pink" campaign to save the lesser flamingoes. This Consultative Group is the coalition of 56 organizations. These organizations undertook intensive national, regional and international pressure campaigns and collected a large number of petitions against the plan. These activities successfully placed great pressure on the Company. On May 22, 2008, the Tata Chemicals Limited officially withdrew from the soda ash mining plan (BirdLife International, 2012a).

However, this was not the end of the story as the Tanzanian government could technically accept a new plan with new location and/or technology (BirdLife International, 2012a). In 2011, it announced its renewed interest in establishing a soda ash mining factory at Lake Natron.

This announcement puzzled many economists and policymakers as an earlier cost benefit analysis study indicated that a 50-year investment in soda ash mining at Lake Natron would lead to a loss of up to US\$492 million. Alternative options were presented, including tourism and ecosystem conservation, which was estimated to yield benefits up to US\$157 billion in 50 years (BirdLife International, 2012b).

#### *Water level fluctuations in Lake Nakuru*

Another threat lesser flamingoes face is drastic water level fluctuations in Lake Nakuru. In 2013, for example, the Lake water level rose rapidly and expanded lake's size from 27% to 40% of the National Park area. The water level rise reduced alkalinity, forcing flamingoes to move to neighboring Great Rift Valley lakes like Elmenteita and Bogoria in Kenya (Moturi, 2015).

#### *Deforestation in the Mau Catchment*

The deforestation and encroachment of the Mau Forest is another threat. These are partly blamed for the water fluctuation problem discussed above. The Mau Forest is the main catchment area for Lakes Nakuru and Natron. Four of the five seasonal rivers that feed Lake Nakuru, and the Southern Ewaso Ngiro River that drains into Lake Natron, arise from the Mau Forest. Some studies estimated that 41% of the Forest was lost between 1973 and 2009 (Khamala, 2010; Olang and Kundu, 2011). Since 2009, the Kenyan government has attempted to enhance catchment conservation (KTWA, 2017).

#### *Impact of intensive agriculture*

Both lakes also have experienced agricultural pollution. Most farmers in Njoro and Elburgon regions in Kenya (eastern part of the Mau Forest) have used synthetic agrochemicals extensively and polluted rivers that flow into Lake Nakuru (Gichuhi, 2008). The damming of the Southern Ewaso Ngiro River in Kenya for irrigation

purposes has obstructed the normal water flow. Extensive irrigation activities resulted into pollution with synthetic agrochemicals (Ramsar, 2001).

## **Factors impeding Kenya-Tanzania collaboration**

### *Inadequate Compliance with International Agreements*

Kenya and Tanzania face these challenges on top of their obligations to meet international treaty requirements. Lake Nakuru (Ramsar, 2005) and Lake Natron (Ramsar, 2001) are designated Ramsar sites. After ratifying the Convention on Wetlands of International Importance especially as Waterfowl Habitat (mainly known as the Ramsar Convention), these countries promised to establish a number of proper wetland conservation measures, including the protection of migratory waterbirds (UNESCO, 1994). The Convention calls for a proper management in the “shared wetlands.” Although it does not define the shared wetlands, with the proper emphasis on migratory waterbirds, one may argue that Lake Nakuru and Lake Natron are virtually shared through the frequent migration of the lesser flamingoes between these two lakes.

Kenya and Tanzania also have agreed to cooperate in protecting migratory species by ratifying other transboundary agreements. For example, the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) require respective parties to take coordinated efforts to protect migratory (waterbird) species (AEWA, 2015; CMS, 1979). So far, Kenya and Tanzania have not done so.

The reason can be at least partially attributed to Tanzania’s policies. The Tanzanian government does not appear to be committed to implementing the Ramsar Convention requirements in managing Lake Natron. Going back to the soda ash mining case, for example, the Convention requires parties to notify the Secretariat about planned developments on Ramsar sites if they will or likely affect ecological characteristics (UNESCO, 1994). Tanzania did not inform the Secretariat about its plan to mine soda ash (BirdLife International, 2012a).

The Tanzania government might have found it unnecessary to inform the Secretariat because it believed that the mining would not affect Lake Natron’s “ecological characteristics.” However, it has also ratified Principle 15 of the Rio Declaration on Environment and Development (UNCED, 1992), Decision II/10 of the Convention on Biological Diversity (CBD, 1995) and the AEWA’s second fundamental principle (AEWA, 2015). These principles and decision promote the precautionary principle.

Resolution VII.16 of the Ramsar Convention requires that a project that “potentially” alter the ecological character of a Ramsar site should be subjected to a rigorous impact assessment (Resolution VII.16). This Resolution is not alone. The Convention on Biological Diversity and the AEWA expect that all countries with a shared basin/wetland should be involved in the environmental impact assessment process (Resolution VII.16, UN, 1992; AEWA, 2015). In promoting the soda ash mining, Tanzania did conduct the environmental and social impact assessment, but it did not carefully consider impacts on lesser flamingo breeding. Only selective information was made available to the public and relevant stakeholders (BirdLife International, 2012a).

Kenya has also been partially blamed for threatening the lesser flamingo breeding site at Lake Natron (Clamsen et al., 2011; Ramsar, 2001). It constructed Oletukat Olenkulo, Leshota and Oldorko dams on the Southern Ewaso Ngiro River for water supply, irrigation and hydroelectric generation (Alliance of Leading Environmental Researchers and Thinkers, 2017). This River is the primary water source for Lake Natron and plays an important role in maintaining the Lake ecosystems (Ramsar, 2001). The dams are reducing sediment/nutrient flows into the Lake and causing the decline of blue algae, which is the main plant the lesser flamingoes feed on (Alliance of Leading Environmental Researchers and Thinkers, 2017; Ramsar, 2001). The Kenyan government also did not engage Tanzania in the environmental impact assessments for the construction of these dams as required by the Convention on Biological Diversity (UN, 1992) and AWEA (AWEA, 2015).

#### *East Africa Community Environmental Agreements*

Regarding regional transboundary legal frameworks, negotiating over the proposed East Africa Federation, six countries in the East Africa Community (Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda) have shown interests in collaboratively managing the environment. As a result, the 2006 East Africa Protocol on Environment and Natural Resources Management was established. Nonetheless, Tanzania has not signed it (Wabunoha, 2008). This has impeded transboundary conservation initiatives to conserve lesser flamingoes. Also, the capacity of the East Africa Court of Justice is still limited in resolving environmental disputes. The implementation of the Protocol plays an important role in further empowering this Court.

#### *Legal and regulatory frameworks for collaboration*

Legislative frameworks are necessary for building foundation for joint policies and action plans. The two countries have established wildlife protection laws. Kenya has the Wildlife Management and Conservation Act (2013). Tanzania has the Wildlife Conservation Act (2009). The implementing agencies are the Kenya Wildlife Service and the Wildlife Division of Tanzania. These laws authorize these responsible agencies to conserve wildlife and combat wildlife crimes. They also provide avenues for regional cooperation in the management of transboundary wildlife conservation areas. Waterbird species are implicitly protected.

The National Wildlife Conservation and Management Policy of Kenya (2017) (MENR, 2017) and the Wildlife Policy of Tanzania (2007) (MNRT, 2007) also promote collaboration with relevant regional and international stakeholders in implementing these policies. So far, Kenya and Tanzania have established collaboration in the management of the Mara River Basin particularly to protect wildlife migration between Serengeti National Park (Tanzania) and Maasai Mara National Reserve (Kenya). Although this type of cooperation has not yet been done for the lesser flamingoes, the Mara River case demonstrates the possibility for doing so.

Kenya and Tanzania also have potential legal grounds to establish better collaboration and policy synergy. Article 109 of the Kenya Wildlife Management and Conservation Act (2013) and Article 94 of the Tanzanian Wildlife Conservation Act (2009) commonly stipulate that responsible ministers in both countries have power to

negotiate over regulations and conservation measures for transboundary habitats. These Articles also empower them to ensure compliance with ratified international agreements. These provisions pave way for joint ministerial committee/meeting on the conservation of migratory flamingoes and their shared habitats. The committee can recommend on how these countries can collaboratively manage wildlife.

The two countries have already collaborated on the management of the Mau Forest mainly under the Lake Victoria Basin Commission and the Mara River Transboundary Water Users Forum (WWF, 2010). A similar effort can be done for effectively managing the Southern Ewaso Ng'iro River, another transboundary water body. The water laws mandate the Water Resources Authority of Kenya (Water Act, 2016) and the Water Resources Division of Tanzania (Water Resources Management Act, 2009) to coordinate with regional stakeholders in using transboundary water resources. The collaboration can help determine the quantity of water stakeholders can use/share. The two authorities can help the Kenya Wildlife Service, Tanzania's Wildlife Division and other relevant stakeholders to monitor water quality standards in the Southern Ewaso Ng'iro River to reduce and/or prevent pollution in Lake Natron.

The two countries also need to establish dispute resolution mechanisms in case there is lack or mismanagement of shared resources and overlapping claims to water. One option is to empower the East Africa Legislative Assembly to develop binding regional/bilateral environmental laws. This will enable the East Africa Court of Justice to effectively address transboundary environmental disputes and crimes. In the absence of the legal ground, a joint ministerial committee can alternatively address some disputes. Community authorities can also resolve small conflicts. This is likely to be effective considering Maasai people are the main residents around Lake Natron in both Kenya and Tanzania. They can easily communicate in both Maasai and Swahili.

#### *Research and Monitoring*

Research is often seen as a major drive for collaborative environmental governance particularly for migratory waterfowls (Kirby et al., 2008). Understanding their migration route, breeding habitats and their interaction within an ecological context is essential for their conservation and effective collaboration. Research on migratory species helps to inform policies and aid the development of transboundary conservation plan and bilateral/multilateral agreements.

Lack of sufficient scientific information about lesser flamingoes and their habitats has hindered their conservation and Kenya-Tanzania collaboration. For instance, very limited studies have been published that inform environmental impact assessment on soda ash mining in Lake Natron (BirdLife International, 2012a). There is no established data sharing methods among the key conservation agencies, hence limiting the accessibility of data (Iliffe et al., 2011).

Research institutions for wetlands and water birds play important roles in facilitating collaborative research between Kenya and Tanzania. The Kenya Wildlife Service and the Wildlife Division of Tanzania are the closest agencies responsible for management and conservation of the wetlands. The Service manages Lake Nakuru and Division manages Lake Natron. The Division has an independent research body,

the Tanzania Wildlife Research Institute (TAWIRI), for conducting and coordinating wildlife research. It has not yet focused on waterbirds, however (TAWIRI, 2018). The Kenya Wildlife Service has no independent research institute to conduct research not only on the wetlands but also on wildlife conservation. The Wildlife Conservation and Management Act (2013), however, mandated the establishment of the Wildlife Research and Training Institute.

Financial constraints and insufficient institutional capacity are serious challenges to the Kenya Wildlife Service and the Wildlife Division of Tanzania. Monitoring migratory birds is an expensive task. So far, the Nakuru branch of the Kenya Wildlife Service has no wetland division or staff. The Service's headquarter in Nairobi, which is the Kenya's focal point for the Ramsar Convention, has a wetland department with less than ten employees.

In 1991, Kenya started taking the African Waterbird Census in collaboration with Wetlands International. The lesser flamingoes censuses are frequently conducted in Lakes Bogoria and Nakuru by reserve/park staff (Ilfie et al., 2011). The censuses are less frequently conducted in Tanzania (Clamsen et al., 2011; Ilfif et al., 2011). However, as there has not been an attempt to count the number by two countries, it is still challenging to estimate the actual population and changes of eastern African lesser flamingoes.

Collaboratively monitoring and sharing information are important to conserve flamingoes and other migratory bird species. The collaboration between the Kenya Wildlife Service and Tanzania's Wildlife Division is essential for this purpose. For example, if the Wildlife Research and Training Institute is established, it can propose a memorandum of understanding with TAWIRI to conduct joint research on migratory species. Research institutions also need to harmonize research permits for transboundary research. To encourage information sharing and dissemination, the two institutions can organize frequent conferences in partnership with local universities and relevant stakeholders.

Synergy in research can also be developed through inter-university collaboration, not only between the two countries but also with universities from other countries. This can help overcome financial burden at least partially. If possible and where necessary, migratory bird research can involve governmental and non-governmental conservation organizations, such as the African Conservation Center, African Wildlife Foundation, BirdLife International, Japan International Cooperation Agency, Kenya Wildlife Service, International Union for Conservation of Nature, Tanzania National Park Authority, Wetlands International, Wildlife Division of Tanzania, and World Wild Fund of Nature, among others.

## **Conclusion**

This paper has argued that Kenya and Tanzania have much room to improve the conservation of the lesser flamingoes. The frequent migrations of the lesser flamingoes between Lakes Nakuru and Natron require wildlife protection officials to more actively engage in transboundary conservation activities. Kenya and Tanzania so far have not adequately ratified and observed international agreements that are relevant to the protection of the lesser flamingoes. One potential option to improve

transboundary synergy for wildlife conservation is to empower the East African Legislative Assembly to develop binding regional environmental laws. This Assembly may also enable the East Africa Court of Justice to better address transboundary environmental mismanagement and crimes.

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