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ARTICLE

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Theodore Okonkwo

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Review

Management of transboundary natural resources

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Transboundary natural resources management means “any process of cooperation across boundaries that facilitates or improves the management of natural resources (to the benefit of all parties in the area concerned)”. Because of their importance, these natural resources must be protected and managed in a way that will prevent their degradation and damage. Actual cases proved that joint management of transboundary natural resources often involves conflict or misunderstanding. The management of these resources should, thus, be anchored on some solid legal and institutional framework. The results of this article shows the need to strengthen the legal and institutional framework for proper international, regional and national management of natural resources that straddle more than one state. The article further reinstates the fact that this is a great means of ensuring environmental protection and avoiding conflicts among countries.

Key words: Transboundary, natural resources, legal framework, disputes, multilateral treaty, bilateral treaty, environmental sustainability.

INTRODUCTION

Natural resources, such as water, wildlife and protected areas, that straddle two or more jurisdictions can present complicated management issues. With the onset of climate change, cooperation among states sharing the resource becomes vital to minimise its impact. Furthermore, divergent interests and sovereignty issues may further aggravate difficulties in obtaining consensus. In the African continent, for example, known for its hot and humid climate, water is scarce and any shared water resources will be, not surprisingly, hotly contested. Difficulties aside, the proper and effective management of transboundary natural resources is vital to the safety, longevity and sustainability of these resources. Water, for example, is a vital natural resource in all parts of the world and even more so in some parts of the world because of scarce resources or greater needs.

Overdrawing or over-extraction of such resource by one of the parties should be controlled by a good management approach because it would eventually make the resource inadequate to serve the needs of all throughout the year. However, various natural resources, such as water and biodiversity, require different levels or types of engagement. Nonetheless, management in which all parties fully participate and puts premium on the sound principles of sustainability is very important. All of these topics will be covered in the following paragraphs starting with a theoretical and conceptual definition of the term ‘transboundary natural resources’ and a short background on existing legal framework governing and regulating the management of transboundary natural resources. Specific cases and examples of transboundary natural resources are also discussed.

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This article demonstrates the novelty of the management of transboundary natural resources in terms of the need for “capacity building for effective nature conservation management.” It also explains that there is need for transboundary collaboration in the transboundary resource management. It advocates the use of natural resources “in a sustainable and equitable manner”. In line with the 2009 United Nations’ Environment Programme study that examined “the role of natural resources and the environment in conflict and peace-building processes”, this article argues that effective and equitable management of transboundary natural resources would engender international “peace-building processes”.

This article is divided into several sections: introduction, statement of the problem, methodology, theoretical and conceptual definitions, results and discussion. The discussion section examines international framework for the management of transboundary natural resources; international disputes over transboundary natural resources with focus on case studies at the regional and national levels; judicial disputes over transboundary natural resources, analysis and evaluation, and conclusion.

Statement of the problem

How will the natural resources that are shared across international borders be managed to prevent environmental problems and conflicts between nation states?

METHODOLOGY

The research method is doctrinal drawn from primary and secondary sources that exist in the area of management of transboundary natural resources. These include international and regional legal agreements and instruments, cases decided by the courts, text books, journals, articles newspapers, magazines and internet sources.

Theoretical and conceptual definitions

Natural ecosystems defy political and geographical divisions. They exist in disregard and without concern of these divisions and delineations. As a result, many natural ecosystems span over different territories and political divisions. Transboundary natural resource can be formally defined as a “valued raw material which occurs in its primary state without human intervention and initiative (Beyene and Wadley, 2004).” Thus, to come within the ambit of the term “transboundary natural resource, a resource must be something that is both precious and untouched by man. The addition of the adjective transboundary further connotes that such natural resource is shared by two or more states. An example of this is the eleven aquifers shared by the United States and Mexico along their borders specifically those found between San Diego and Tijuana, Cuenca Baja del Rio and Colorado, Sonoyta and Papagos, Los Mimbres and Los Palmas, to name a few (IGRAC (2015). Other transboundary natural resources include oceans, rivers, lakes, wetlands, game reserves, rangeland for livestock, wildlife and

protected areas, mountains and oil and gas (Bankobeza, 2017), among others.

Because of the nature of such structures, there is a need for several states to work together to manage how such resources should be utilized, preserved and sustained. Such transboundary natural resources, therefore, require parallel transboundary management systems (Varis et al., 2008). Transboundary natural resource management is, thus, defined, as “any process of cooperation across boundaries that facilitates or improves the management of natural resources to the benefit of all parties concerned (Kaua, 2012).” Transboundary natural resource management - hereinafter referred to as TNRM - requires that states affected and involved enter into cooperation through bilateral or multilateral agreements or talks, such as what is being practiced in the African continent (Hanson et al., 2014).

Under the principle of sovereignty in international law, all countries have the right to develop and implement their own regulation in the management of their own natural resources (Delimatsis, 2016). Such utilization and regulation must take care that they do not impinge or otherwise destroy the environment of other states because then such resources will ultimately become useless (Tarlock and Dembach, 2009) . Under transboundary natural resource management,, states must transcend their sovereign rights, come together and resolve issues concerning transboundary natural resources and their common concerns regarding them. In practice, however, TRNM is a complicated issue because of the lack of effective cooperation in many cases, which can ultimately lead to failure (Marsden, 2016). This failure can result in heightened conflicts and even risks to the health and well-being of the people (Nalecz, 2011).

RESULTS

The result of findings in this article include but not limited to the following:

- a. The emergence of resource - induced conflicts among nation states.
- b. Flowing from above, there is need for broad cooperation across international boundaries.
- c. There is high potential for natural resource “induced competition and violence”.
- d. Further result shows that cooperation among nation states would reduce the escalation of conflict on natural resource management “across boundaries”.
- e. The results of this article shows the need to strengthen the institutional framework and capacities of nation states in the nations that are exposed to adverse environmental effects arising from the natural resource “induced conflicts”.
- f. Finally, there is a great expectation and hope that transboundary natural resources management is pivotal in achieving conservation of the ecosystem “and peace, both between and within countries”.

DISCUSSION

International legal framework for the management of transboundary natural resources

Agreements concerning TNRM often come in the

following forms: global legal frameworks, regional agreements and transboundary regulatory framework (Razzaque, 2013). The United Nations Charter provides the broadest legal framework for managing transboundary natural resources as a means to sustain peace among states (Nolte, 2013). Its preamble, for example, provides that states should create international machineries that would foster the progress and advancement of all people in the areas of economy and society (UN 2017). Organisations such as the Southern African Development Community are within the ambit of this mandate (Earle et al., 2013). The international customary laws, such as the principles of state sovereignty, state responsibility and good neighbourliness, can also serve as underpinning legal frameworks for TNRM (Dhliwayo, 2002).

In 1992, the Earth Summit was held. It was called the United Nations Conference on Environment and Development, but more popularly referred to as Rio 92 or Earth Summit (Reddy and Wilkes, 2012). During this gathering supported by 191 countries all over the world, green economy was pushed (IFPRI, 2012). It has been driving the establishment of national environment protection legislations, such as that of Samoa's (Smith et al., 2014), as well as international policies that foster sustainable environment (Sanchez and Croal, 2012). The Earth Summit impacted concerns for transboundary natural resource sustainability and expressed through multilateral and bilateral approaches (Mayoral-Philips, 2017).

Dealing with transboundary natural resources has always been problematic. For example, there are about 263 existing transboundary basins identified to date, but many have no standing agreements between riparian states (Sehring and Deabold, 2012). There are more than 256 international laws and treaties existing on transboundary waters, yet, states continue to grapple with the problem (Blatter and Ingram, 2000). This is problematic because isolated actions involving water resources have wide-ranging impacts on other riparian states (Parhi and Sankhua, 2013). The first type of laws crafted to meet and regulate the issues involved with transboundary waters was the state-centric model, which is largely anchored on the principle of state sovereignty (McCaffrey et al., 2017). This model was predominantly used in Europe and North America and was deemed effective enough until the 1960s. In this model, states send their diplomats, bureaucrats and technocrats to meet with those of their counterparts to form commissions that deal with the issue of transboundary resources. The participation of sub-national actors is considered as a danger that undermines the conduct of foreign affairs. These commissions, however, do not have teeth and have narrow mandates, but depend upon the political will of the sovereign they represent.

With the failure of state-centric models in solving transboundary natural resources, other forms of complex

systems emerged. Various states entered into treaties and agreements, such as the Water Quality Agreements of 1972 in the Great Lakes region (Ludwig, 2013), and the Rhine Action Program 1987 in the Rhine River (Thomas and Mow, 2017). The Commissions created by these agreements became more complicated. The International Commission for the Protection of the River Rhine against Pollution, for example, has an assembly, a secretariat and various groups working for it (ICPR, 2017). Various institutions, staffed by sub-national actors, also developed. These included the Comite Tripartite and Comite Bipartite in the Upper Rhine Valley, the Fronteras de las Californias in the US-Mexico borders, the Border Environmental Commission and the North American Development Bank, among others.

International disputes over transboundary natural resources

Regional level: Case studies

Nile river basin: The Nile river is known as the longest river in the world - about three million kilometres - and is a very important source of water for about 160 million people. The river runs through ten basin countries in the North Eastern region of African continent that include Egypt, the Democratic Republic of Congo (DRC), Sudan, Ethiopia, Kenya, Rwanda, Tanzania, and Uganda, Burundi and Eritrea (El-Fadel et al., 2003), as shown in Figure 1. The importance of the Nile River cannot be overstated. Being located in the populous African continent known for its arid and hot climate, the Nile River is a critical river basin (Mohamoda, 2003). Many of the countries within its path are 'water scarce' and some are involved in various forms of conflicts further aggravating the necessary cooperation required to effectuate a successful TNRM (Di Nunzio, 2013).

Nile River has two major tributaries: the White Nile, which begins in Burundi, and the Blue Nile, which emerges from Ethiopia. The White Nile flows from Lake Victoria in Burundi and into Rwanda and Congo. The Blue Nile, on the other hand, also flows through Eritrea and Sudan. Both of these tributaries merged with the Atbara River, located in Khartoum, Sudan, to form the main body of the River (Oestegaard, 2002). Egypt relies mainly on the Nile River for its water needs, such as irrigation, but Ethiopia with its fast rising population is seen as potentially needing more from the River in the near future than today (Paisley and Henshaw, 2013). The Nile River Basin had been subjected to various agreements, most of which benefitting Egypt. Under the supervision of the British, Egypt entered into an agreement, called the Anglo-Ethiopian Treaty with Ethiopia over the use of the Nile River in 1902 (Kimenyi and Mbaku, 2012). The vital participation of Great Britain in these agreements was underpinned by its interests in

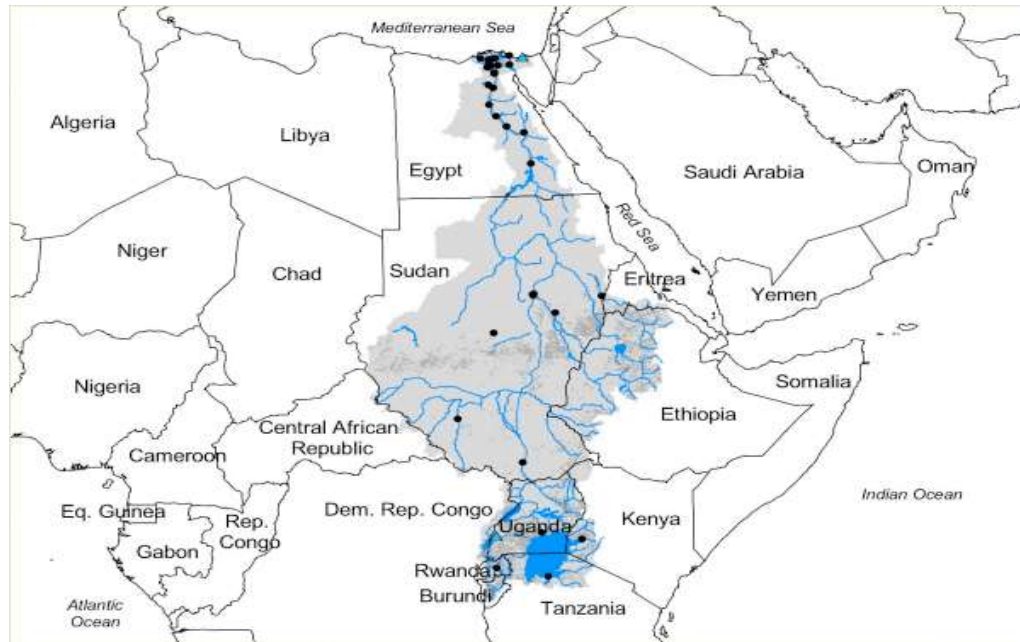


Figure 1. Nile River Basin

Egypt where it had established cotton plantations (Abdo 2004). The 1902 Treaty prohibited Ethiopia from building any structure that would impede the flow of water downstream into Egypt. Ethiopia agreed to this in exchange for obtaining its independence from British rule (Wood and Alsharhan, 2003). However, it later on repudiated the agreement. In 1929, Britain again power-brokered another agreement called the Nile Waters Agreement in which Egypt was given the prerogative to reject any future hydroelectric projects along the River in any of the British colonies that included Sudan, among others (Kendie, 1999). Even after Britain had given up its rule over these African states, Egypt was able to enforce its riparian advantage over the River by invoking the principle of state succession under international law (Wendl, 2016). In 1959, Egypt and Sudan entered into the Agreement for the Full Utilization of the Nile Waters, which basically gave them right over the entire flow of the River in the Aswan Dam. Unsurprisingly, the other riparian states objected to the agreement causing tension in the region.

At present, the major regional regulatory agreement involving the Nile River is the Nile Basin Initiative.. The NBI is an informal dialogue process between and among the riparian states of the Nile River (Steven). It was signed by the majority of riparian states along the Nile River for the purpose of institutionalizing a mechanism for the management and cooperative actions among the states in a way that would benefit them all (UNEP, 2005). These countries took a step further in 2008 with the signing of the Khartoum Declaration, which expanded cooperation among the states establishing for that

purpose a permanent Nile River Basin Organization. This was, however, non-binding. However, in 2010 Egypt refused the proposal of seven Member States to open the Agreement for signature (IWG 2017). In 2015, Egypt, Sudan and Ethiopia entered into another agreement in Khartoum in which they agreed to abide by principles in dealing with the Nile River, among them cooperation, development and avoidance of significant damage (Sumer, 2016).

The Grand Ethiopian Renaissance Dam Project: This project named the Grand (or Great) Ethiopian Renaissance Dam Project is located in Ethiopia, with the Ethiopian Electric Power authority as the client. The total value of the project is estimated to cost Euros 3,377.05 million. Works started in December, 2010 and was expected to be completed in 78 months. The project is located approximately about 500 km north west of the capital Addis Ababa, within the Benishangul - Gumaz region that straddles the Blue Nile. On completion the Grand Ethiopian Renaissance Dam will be the largest dam in Africa, measuring 1,800m long, 155 m high and with a total volume of 74,000 million m³. The project involves the construction of a major dam encompassing Roller Compacted Concrete (RCC), housing two power stations which are situated on the right and left banks of the river. It consists of sixteen Francis turbines with 6,000 MW installed power which is expected to produce 15,000 GWh annually. The Grand Ethiopian Renaissance Dam (GERD) project involves Egypt, Ethiopia and Sudan which countries have signed an agreement on the Nile

waters.

The cooperation agreement over the GERD project on the tributary of the river Nile is expected to “ease tensions over regional water supplies”. The agreement on Nile dam “would pave the way for further diplomatic cooperation on the Grand Renaissance Dam, which has stirred fears of a regional resource conflict”. Ethiopia has however assured Egypt and Sudan “that the dam will not significantly cut the river’s flow to its rapidly growing population”. The country which is the source of the Blue Nile which joins the white Nile in Khartoum and flows in to Egypt, has stated that the dam will not disrupt the river’s flow” and hopes the project will transform it into a power hub for the electricity hungry region”.

The GERD project is expected to resolve conflicts over water resources among Ethiopia, Egypt, Sudan and other downstream users that rely on the Nile river for farming, industry and drinking water.

The GERD is very significant for Ethiopia, a country that is readily known for persistent drought, will definitely revive Ethiopia’s economy, and will affect other countries that rely on the Nile river. However, despite Ethiopia’s assurances, this article argues that the GERD “carries significant risk” for its downstream users such as Egypt and Sudan, which countries depends on the flow of water from Ethiopia’s high lands. But the “do-no-harm” agreement signed between Ethiopia, Egypt and Sudan appears to be a very good cooperative move that will work out a settlement” and “... commitment to a peaceful resolution” of conflicts over water resources. With coordinated management the GERD would benefit downstream users “provided everyone works together”. The agreement signed by the three countries shall be operated in such a manner as to guarantee “a minimum annual release”. If effectively managed, the GERD would definitely benefit Egypt, Sudan and other downstream, though without proper management, countries downstream could face flooding if too much water is released and the dams in such downstream countries are not prepared for a sudden increase in their own water levels. The solution to making the GERD benefit Sudan, Egypt and other downstream users remains committed management, cooperation and coordination.

Southern African Community Development (SADC)

Region: Southern Africa is one of those regions in which state-level management of natural resources is not adequate. Many of the region’s natural resources, such as rivers and wild life, are shared and are straddled in many states in the region (Turton, 2003). Transboundary management is so important in the region because of the importance of water in this region (Dellapenna and Gupta, 2009). Many forms of livelihood in the region are dependent on these natural resources because of the lack of employment opportunities putting so much pressure on biodiversity. More than half of the GDP of the region comes from natural resources in the form of agriculture, mining and forestry (Falk, 2008). For example,

the region thrives on wildlife-based tourism and this becomes pivotal when other forms of economic activities are not possible (Wily and Dewees, 2001). The World Tourism Organization forecasted a 5.4% annual growth of tourism in the region, while the World Travel and Tourism Council were more upbeat with a 5.9% prediction over the next decade. All these, however, are contingent on the implementation of effective measures to ensure the correct utilisation, preservation and management of the region’s natural resources, particularly wildlife.¹

Towards this end, South African states established the South African Development Community Treaty in 1992, which has roots in the 1980 Southern African Development Co-ordination Conference or SADCC.² It is constituted by the states of Angola, South Africa, Mauritius, Mozambique, Democratic Republic of Congo, Botswana, Lesotho, Tanzania, Zimbabwe, Swaziland, Namibia, Malawi, Seychelles, Zambia and Madagascar.³ The purpose of the Treaty is to foster a more meaningful “sustainable and equitable economic growth,”⁴ among others.

The Waterton-Glacier International Peace Park: The Waterton-Glacier International Peace Park is a park where diverse species of plants and mammals, as well as features like alpine, forest and prairie can be found. It is located in the Rocky Mountains of North America and is actually a combination of the Waterton Lakes National Park of Alberta, Canada and the Glacier National Park of Montana, United States. The natural resources merger was made in 1932 to form the first international park in the world.⁵ The natural resources that can be found in the Park and are shared by the US and Canada are diverse wildlife, panoramic and scenic view, sparkling waters and pure and pristine state of ecological processes, among others.⁶

While the two parks belonging to different states are merged as one, the parks continue to be regulated by the laws of their respective governments.

¹ Yemi Katerere, Ryan Hill and Sam Moyo, ‘A Critique of Transboundary Natural Resource Management in Southern Africa’ (Paper No 1, IUCN-Rosa Series on Transboundary Natural Resource Management, 2001) <<https://portals.iucn.org/library/sites/library/files/documents/2001-046-1.pdf>> accessed 27 July 2017.

² USAIBP, Southern African Development Community Business Law Handbook’ (International Business Publications, 2009).

³ SADC, ‘Member States’ (South Africa Development Community, 2017) <<http://www.sadc.int/member-states/>> accessed 28 July 2017.

⁴ SADC, ‘SADC Objectives’ (South Africa Development Community, 2017) <<http://www.sadc.int/about-sadc/overview/sadc-objectiv/>> accessed 28 July 2017.

⁵ UNESCO, ‘Waterton Glacier International Peace Park’ (United Nations Educational, Scientific and Cultural Organization, 2017) <<http://whc.unesco.org/en/list/354>> accessed 26 July 2017.

⁶ Ifan Thomas and Jeff Mow, ‘Waterton-Glacier International Peace Park’ (Natural Resources, 2017) <http://naturalresourcespolicy.org/docs/Hands%20Across%20Borders/TBC%20Profiles/TBC%20Profile_Waterton%20Glacier%20International%20Peace%20Park_Freimund.pdf> accessed 26 July 2017.

There is no unified or universal management plan that is imposed over the entire park. Thus, the Waterton Park is being managed under the Canadian law Canada National Parks Act, while the Glacier Park part of the Peace Park is being managed under the auspices of the Organic Act of 1916.⁷ The management of the Park is, therefore, cooperative in nature and is practiced in programs, such as those for invasive plant species and even in emergence responses in search-and-rescue measures or fire-fighting.⁸

Due to the nature of the management of the Park, issues have cropped up in the past that affected its management. Some of these issues include security, especially along the border, that was highlighted especially in the wake of the 9/11 incident.⁹ Some emergency incidents also affect the management of the Park because these are episodic and unpredictable, like fire control and invasive vegetation.¹⁰ In these cases, the need for effective and immediate communication between the managers and staff of both sides of the Park become of vital importance. The broader cooperation between the two parties involved in the Park has been set in formal terms through the creation of the Crown Management Partnership that was set up by the respective supervisors of both sides in 2001. Since then, the partnership became a yearly convention participated by relevant agencies from both countries at the federal, state and local levels.¹¹

National Level: Case studies

US-Mexico transboundary water resources: The US and Mexico are next door neighbours and as such, share many water resources along the borderlines. These countries have two major transboundary basins, namely the Rio Grande in the Mexico side and the Colorado River in the United States' side.¹² Despite the transboundary nature of the two basins, the waters between them are not shared. Thus, the negotiation by the two countries at the beginning of the 20th century did not include the waters of the two basins and were negotiated separately. However, as the US had a higher

riparian vantage over Mexico, it could control the amount of water that Colorado River can release to the lower riparian state. Realizing this, Mexico demanded that a trade-off should be negotiated between the two countries in which Mexico would provide more water to the US from Rio Grande and the US would provide more water to Mexico from the Colorado River.¹³

In 1944, an agreement was drawn and entered into by both states. The agreement was called "Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande" and established certain elements of the transboundary relations between the states.¹⁴ First, the treaty laid out the amount of water that each state should allocate to the other, the specific dates for the delivery and the process of estimating the volume of the allocated water. Second, the treaty also set out the structures that should be built on both sides to regulate and manage the water resources including dams, water reservoirs, and flood control mechanisms. Lastly, it also designated the International Boundary and Water Commission as the specific body that would act as the settlement agency in the event any issues would crop up between the two countries regarding the transboundary water resource.¹⁵

"W" National Park or "W" Regional Park: This national park is located in West Africa and straddles the River Niger criss-crossing Niger Republic, Benin Republic and Burkina Faso. The park is administered by the three countries, which managed them under the name "W" Transborder Park. It is a UNESCO World Heritage designated site. Officially the park is known as the "WAP" park complex and belongs to the International Union for Conservation of Nature protected areas. Prior to the independence of the three countries, the "WAP" park complex was managed under one body by the colonialists. Thereafter, when the countries secured independence from their colonial masters, each assumed the management of the park located within its jurisdiction.

In 1984, the three countries entered into a regional agreement to end poaching and "slow down the loss of biological diversity, through the installation of an effective and sustainable system of transboundary management of ecosystems and natural resources". Realistically, the only concrete way to manage the "WAP" Park Complex and avoid conflicts is to entrench a viable regional co-operation of resource management. With increase in population and diversification of economy, agricultural and peasant populations have settled "around the periphery of the park", thus creating conflicts as they

⁷ NPS, 'Periodic Report on the Application of the World Heritage Convention' (National Park Service, 1995) <https://www.nps.gov/oia/topics/Waterton_Glacier.pdf> accessed 30 July 2017.

⁸ Paul Dingwal, 'Waterton-Glacier International Peace Park' (UNESCO World Heritage Centre, 2009) <<file:///C:/Users/acer/Desktop/TransboundaryNatres/828unescowatertonmissionreportfinal.pdf>> accessed 30 July 2017.

⁹ Saleem Hassan Ali, *Peace Parks: Conservation and Conflict Resolution* (MIT Press, 2007).

¹⁰ NPC, 'State of the Park Report' (National Park of Canada, 2008) <file:///C:/Users/acer/Desktop/TransboundaryNatres/REP_SPR_e.pdf> accessed 29 July 2017.

¹¹ CMP, 'History' (Crown Management Partnership, 2011) <<http://crownmanagers.org/history/>> accessed 30 July 2017.

¹² UNESCO, *Free Flow: Reaching Water Security through Cooperation* (UNESCO 2013).

¹³ Itay Fischandler and Eran Feitelson, 'The short-term and long-term ramifications of linkages involving natural resources: the US ^Mexico transboundary water case' (22 Environment and Planning C: Government and Policy 2004: 1-18).

¹⁴ Harlan Koff, *Deceiving (Dis)appearances: Analyzing Current Developments in European and North American Border Regions* (Peter Lang, 2007).

¹⁵ Aaron Wolf, 'Transboundary Water Conflicts and Cooperation' In D Kenney, ed, *In Search of Sustainable Water Management* (Edward Elgar, 2005).

struggle to harness the scarce natural resources to support lives. In 1999, Convention No. 6135/REG was signed between the three countries in order to facilitate a development project “for contiguous area and environmental management” initiated by the European Communities Commission in 1987. Apart from the two mutual agreements signed by the three countries in 1984 and 1999, other regional conservation projects were undertaken “for contiguous protected areas in the “W” park” for the conservation of biodiversity which were financed by the IUCN and the European Union. The aims of the 1984 agreement and the 1999 Convention were to harmonize existing policies “among all parks in the complex, and joint operations along with the creation of one, inter-state committee”. However, these aims have not been achieved as each country appears content with drawing up its own “management policies”. This has led to poor or no communication and cooperation among the three countries, thus, the management of the “WAP” park complex has failed to attain its ultimate goals.

The Dzanga-Sangha River Tri-National Protected Areas: The Sangha River Tri-National Protected Area, situated in the Northwest Congolian Moist Lowland Forest eco-region consists of the Dzanga-Ndoki National Park, the Dzanga – Sangha Dense Forest Special Reserve, the Central African Republic, the Nouabale-Ndoki National Park, the Republic of Congo, the Lobeke National Park, the Republic of Cameroon and the “Zone Peripherique” (which is a buffer zone of the Nouabale - Ndoki). The Sangha River Tri-National Protected Area was the outcome of mutual cooperation between the three countries with the main objective of conserving “the second largest rain forest area of the earth”, which is a product of the Central African Forest Commission (COMIFAC). The conservation project of these countries that are involved in these protected areas is to protect the animal species that are dependent on the “extensive habitats”. Such animal species are elephants, gorillas, forest buffalos and Bongo Antelope. There are also tri-national institutions established under this cooperation to plan and implement the management of these protected areas in order to enhance research, promotion of eco-tourism and discourage poaching.

To effectively manage these protected areas, the three countries involved meet regularly. There is also a “conjoint multinational patrols” to secure the three protected areas from poachers, smugglers of fauna and flora, illegal fishing, ivory and arms. These protected areas are not without conflicts. The entire area has been put under the pressure of natural resource “usage” and “competition over resources” by the several human populations that occupy the areas. This human population usually adopt “different approaches to resource use and management”. This has caused disruption of “historical land use patters (sic) and activities”. Conflicts abound as a result of natural resource use exploitation and inefficient response by the

governments of these three countries. Enforcement agencies of the countries involved in the management of these protected areas often disagree which most times result in armed conflicts.

In an effort to stem the tide of conflicts over resource use and management, the three countries which involved the Central African Republic, the Republic of the Congo and Cameroon have negotiated and signed two agreements. Furthermore, other central African countries on March, 1999 at Yaoundé signed what is now known as the Yaoundé Declaration and on December, 2000 the Sangha River Trinational Agreement was signed.

Judicial disputes over transboundary natural resources

The Trail smelter case

Air is a natural resource that comes within the ambit of the definition in that it is a valued raw material existing in nature. The Trail Smelter case concerns transboundary air shared in the borders of the United States and Canada. Trail is a small town in British Columbia and is located near the international borders that separate Canada from the United States. It was also the site of the Trail smelter - the Consolidated Mining and Smelting Company, which refined low-grade zinc ores. Trail was the smelting capital of British Columbia in the early 1900s and this literally caused the small town to be covered in smoke emanating from the stacks of the smelting company. As a result, agriculture within the area, on both sides of the fence suffered. Local farmers sued the company, but a local judge awarded them only \$60,000 and the smelting company continued to operate.¹⁶ As company operations expanded, the company dealt with it by constructing a 409-ft smokestack. The tall structure caused polluted air from the smelter to be brought a longer distance and into the other side of the fence in the US jurisdiction, particularly in Stevens County, Washington. As the Company continued to ignore complaints from these farmers, the latter were compelled to bring the case for judicial settlement in 1926 and also after direct negotiations between the farmers and the Company collapsed. The US and the Canadian governments, which also interceded but were unable to compel the parties to a settlement, sent the case to the International Joint Commission (IJC). The IJC, however, merely offered a compensation settlement, but not a punitive or regulatory measure against the Company to the disgust of the farmers.¹⁷

The US and Canada entered into an agreement in 1935 for the creation of a tribunal that will settle the matter. The agreement provided that the chairman of the

¹⁶ Rebecca Bratspies and Russell Miller, ‘Transboundary Harm in International Law’ (Cambridge University Press, 2006).

¹⁷ Ibid.

Tribunal will neither be an American or Canadian citizen and that it should settle the following issues: whether damage was sustained by the farmers due to the smelting operation in Trail; if damage is established, the indemnity for such damage and the measures should be established to prevent the smelting company from doing more damage and the extent of the limitation. The parties also agreed that the law to be followed in settling the case was the law of the US and international law.¹⁸

The tribunal ruled in favour of the farmers. In deciding the case, the tribunal relied on the law of the US and international law, which states to the effect that a state is prohibited in using or acting within its territory in such a manner as to pose harm to the territory of another. The Tribunal also established a strict standard of liability to be followed in the future concerning transboundary harm. For its part, Canada adopted measures to prevent similar events from happening in the future. It also indemnified the farmers USD 420,000 and agreed to control emission in the future.¹⁹

The Skagit River/Ross Dam case

The Skagit River/Ross Dam controversy is another environmental conflict that involves the United States and Canada. The Skagit River is a 162.3 foot-river the length of which is unevenly divided between British Columbia and Puget Sound in Washington. The headwater of this river starts from Manning Provincial Park of British Columbia, moves downstream to pool into the Ross Lake reservoir before Ross Dam and pools again further down in the Diablo and Gorge Reservoirs before traversing further into United States territory.²⁰

The Ross Dam was one of the three dams constructed by the Skagit Power Company, and later by the Seattle City Light, along the Skagit River. The other two were Gorge Dam and Diablo Dam. These dams provide Seattle with ¼ of its power needs.²¹ Seattle made an application to the International Joint Commission to allow flooding part of the British Columbia by 1725 ft. Elevation within the High Ross flood zone after talks with British Columbia bogged down. The IJC granted the application to Seattle, provided it compensates any damage to BC due to the increase in water levels at the Skagit River.

However, with the changing of administration hands, the resulting negotiated agreement between Seattle and BC was not ratified. In 1967, the two parties entered into an agreement in which BC agreed to be compensated for \$34,566 annually for a 99-year lease by Seattle of the relevant portion of the High Ross zone.²² The three-dam system proposed by Seattle Light was aimed at the maximisation of power output as well as control flooding in the lower portion of the Skagit Valley. The proposal also called for the flooding of a portion of BC, as well as for raising the height of the Ross dam by 122.5 feet so that it will have a total height of 662.5 feet or an elevation of 1,725 above sea level.²³

By 1969, however, opposition to the Seattle proposal started to snowball. Concerned organisations, such as the Sierra Club, the North Cascades Conservation Council and other environmentalists from both sides of the fence began to voice out their objections to the proposal.²⁴ Later, even the BC Legislature and the Canadian Parliament, as well as the Washington State Ecology Commission and the Washington Department of Ecology, joined the voices of dissent. Developments appeared to have forced a stalemate: the Federal Power Commission granted Seattle's application for the construction of the High Ross Dam and the IJC rejected the BC application for the annulment of its 1942 order. Changes in the IJC composition, however, gave BC a second chance as the Commission granted the latter its application for review of the ruling. In 1982, the IJC issued a Supplemental Order in which it ordered Seattle to maintain the status quo pending the renegotiation between parties under the supervision of a Board to be created by the IJC.²⁵

ANALYSIS AND EVALUATION

Drawing from the discussion in this article, it is argued that population is a strong factor in conflicts arising out of natural resource use that transcend and straddle international borders. In Africa, which is regarded as the world's least developed region (or least developed countries (LDCs)), population increase has exacerbated conflicts over natural resource use and their management. In African continent, the processes of managing transboundary natural resources have recorded a downturn result due to poverty, traditional and religious idiosyncrasies, over population, lack of funds and lack of modern equipment and facilities to delimit and demarcate regional boundaries. All these, particularly, over population has put so much pressure on land and natural resources, hence armed conflicts and over-

¹⁸ 'Claims: Damages Resulting from Operation of Smelter at Trail, British Columbia' (United States and United Kingdom, 1935) <<https://www.loc.gov/law/help/us-treaties/bevans/b-ca-ust000006-0060.pdf>> accessed 29 July 2017.

¹⁹ Marie-Louise Larsson, 'The Law of Environmental Damage: Liability and Reparation' (MartinusNijhoff Publishers, 1999).

²⁰ Jacqueline KroloppKim, 'The Skagit River-High Ross Dam Controversy: A Case Study of a Canadian-U.S. Transboundary Conflict and Negotiated Resolution' (Skagit Environmental Endowment Commission, 2017) <<http://skagiteec.org/skagit-research-library/sp-files/sec-1987-4.pdf/view>> accessed 26 July 2017.

²¹ Rich Landers, Dan Hansen, Verne Huser and Douglass North, *Paddinton Washington: Flatwater and Whitewater Routes* (The Mountaineer Books, 2008).

²² Kim, 'The Skagit River...'

²³ Jackie KroloppKim and Marion Marts, 'TheSkagit-High Ross Controversy: Negotiation and Settlement' (26 Natural Resources 2 1986: 261-289).

²⁴ Philip van Huizen, 'Panic Park': Environmental Protest and the Politics of Parks in British Columbia's Skagit Valley' (170 BC Studies 2011: 67-92).

²⁵ Ibid.

exploitation which invariably leads to environmental damage and dehydration. It follows that what works for the developed countries in the management of transboundary natural resources would definitely not work for these LDCs. For these reasons, there appears to be a backlash on these LDCs as they become vulnerable to conflicts as they struggle to access the available natural resources. The management of transboundary natural resources raises several issues: resource management, biodiversity, conservation, water resource, promotion of regional economic development, regional and transborder cooperation, peace building and conflict resolution between nations and local communities. Given this situation, the international comity of nations has initiated, negotiated and signed several agreements, conventions, protocols and treaties to govern each or a collection of issues. Remarkably, water has become a common transboundary resource which has a much greater body of law and agreements than other natural resources. This is so, because water is an internationally shared resource which is vital for economic growth, food production and human survival. Water crosses national borders in the nature of groundwater, lakes, rivers, oceans and tributaries. Conflict often occurs when nations try to allocate water, thus, the need for international law and agreements to manage them. More so, a greater percentage of world's human and animal population depend on fresh water from international rivers for daily sustenance of life. This has therefore not only generated conflicts and cooperations but an extensive body of international agreements to manage them. Because of the importance of water to life, disputes involving violence usually occur over water. Water can either be a source of joy and benefit to countries or of bitter conflict, countries therefore, work cooperatively to promote peaceful creation of water agreements that benefit everyone.

Water as a common resource, suffers "the dilemma of the tragedy of the commons", in that countries are inclined to use water resources without due regard to the neighbouring states' needs and interests. Most times, countries prevent others from gaining access and using the water. It all boils down to competition, and raises the issue of laws and agreements, which in itself is not self-executing as one country with shared water resource may cooperate and the other would not, in which case the co-operating country loses. But if both countries cooperate, conflicts are avoided, therefore, the goal of the international comity of nations remain "to promote cooperative international agreements concerning transboundary bodies of water using international law".

In the past ten years, several transboundary natural resource management areas, especially the ones discussed in this article has appeared both in the LDCs and the developed world. Internationally, there are 169 adjacent protected areas straddling 113 countries, including 667 private protected areas. Africa hosts 35 of

these in 34 countries with 148 protected areas. However, it remains uncertain how these have impacted successfully on the regional economic development of the continent.

This article argues that the existing literature on management of transboundary natural resources could be categorized into two: resource damage and conflict and their effects on the natural and human environment, whilst there is also the issue of cross-border resource management. Certainly there is a connection between natural resources conflict and environment, because environmental degradation which invariably results in natural resources depletion remains a significant cause of "social turmoil". In this sphere, the LDCs are more prone than the more developed countries, because the former has "less capacity to intervene in order to keep this damage from producing serious social disruption, including conflict".

In their quest for transboundary natural resources exploitation, countries get locked in conflicts and unless properly managed can escalate to armed conflicts. If this happens, populations of human beings are displaced which in part leads to deforestation and environmental damage. Transboundary natural resource management could therefore play an important part in abating conflict and environmental protection.

Conclusion

The management of transboundary natural resources are indeed complicated and in some instances, very difficult as shown in some of the cases discussed in the previous paragraphs. There are many challenges involved in their management and new challenges are cropping up.²⁶ Issues of sovereignty, existing open conflicts and disputed areas are just some of the matters that can complicate their management.²⁷ As shown by some of the examples discussed in the previous pages, the management of transboundary natural resources does not come easy and sometimes, may be the cause of conflicts and clashes. Nonetheless, all efforts must be exerted to meet the challenges because cooperation - the effective kind²⁸ - in managing these resources is vital to its sustainability, safety and security, not to mention its importance to millions of people that continue to directly benefit from these sources. Natural resources, such as water and air, are vital to the existence and survival of man, and thus, must be protected from all forms of degradation and damage that irresponsibility and overuse can bring about. However, legal frameworks for the regulation or joint management of transboundary natural

²⁶ Juliet Christian-Smith, Peter Gleck and Heather Cooley, *A Twenty-First Century US Water Policy* (Oxford University Press, 2012).

²⁷ Luis Garcia, Diego Rodriguez and Marcus Wijmen, *Earth Observation for Water Resources Management* (World Bank Publications, 2016).

²⁸ Andrea Haefner, *Negotiating for Water Resources* (Routledge 2016).

resources are mostly based on broad and rather general legislations regarding the environment. The lack of an effective legal framework is also a hindrance to advances in transboundary resource management.²⁹ The failure to address certain matters regarding the management of transboundary natural resources can be critical not only to the status of the involved states, but also to the involved natural resources. Effective transboundary resource management usually deviate from supply-side management type towards the adaptive type and from unilateralism to multilateralism.³⁰ Nonetheless, an effective legal framework with teeth is also important to guide parties in drafting their respective agreements.

Future research

There is still a great potential for a possible future research in the field of management of transboundary natural resources. Detailed study of conflict resolution mechanism of how countries resolve transborder environmental conflict and the legal approaches they adopt will benefit a purposeful analysis of transboundary natural resource management in mitigating escalation of conflict. Research should also explore a study of mutual relations of states with respect to conflict between local, national and regional groups using transboundary natural resources. Overall, this is likely to rub-off on several areas: conservation, resource management, security, sovereignty, cooperation and peace building. This topic therefore has a great prospect for future research.

CONFLICT OF INTEREST

The author has not declared any conflict of interest.

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²⁹ Winston Yu, Rita Cesti and Ju Young Lee, *Toward Integrated Water Resources Management in Armenia* (World Bank Publications, 2013).

³⁰ Mark Zeitoun, Marisa Goulden and David Tickner, 'Current and Future Challenges Facing Transboundary River Basin Management' (ResearchGate, 2013) <https://www.researchgate.net/publication/264492824_Current_and_future_challenges_facing_transboundary_river_basin_management> accessed 27 July 2017.

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