

THE NECESSITY OF A SECURITY BARRIER IN THE NORD-KIVU AND  
ITURI BORDER PROVINCES OF THE DEMOCRATIC  
REPUBLIC OF THE CONGO

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MASTER OF MILITARY ART AND SCIENCE  
General Studies

by

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

## ABSTRACT

THE NECESSITY OF A SECURITY BARRIER IN THE NORD-KIVU AND ITURI BORDER PROVINCES OF THE DEMOCRATIC REPUBLIC OF THE CONGO, by Captain Celestin Mbayo Lupungu, 94 pages.

Since the change of political regime in 1997, the overall situation in the eastern part of the Democratic Republic of Congo has been closer to that of a failed state. Taking advantage of the weaknesses of the nascent power, Rwanda and Uganda troops that supported the revolution continued to support new rebellions and militant groups. Regardless of the ongoing war crimes, they found the opportunity of plundering mineral resources. Meanwhile, the use of hard and soft power have succeeded, but without a durable solution. Given the porosity of international borders and to solve their security problems, some countries such as China, have built barriers like the Great Wall. Others have built fences, minefields, and other deniability capabilities. They inspired this research that, as a result, evaluates options and informs and recommends that the Congolese decision maker and stakeholders build a fence as the last resort. A fence is feasible, acceptable, and suitable, but the last word still belongs concurrently to the chief decision maker and stakeholders.

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## ACRONYMS

CBP	Customs and Border Protection
CDM	Chief Decision Maker
COA	Course of Action
DHS	Department of Homeland Security
DMZ	Demilitarized Zone
DRC	Democratic Republic of Congo
FARDC	<i>Forces Armees de la Republique Democratique du Congo</i> [Democratic Republic of Congo Armed Forces]
FY	Fiscal Year
GDP	Gross Domestic Product
IDP	Internally Displaced Persons
JSA	Joint Security Area
M23	<i>Movement du 23</i>
MDL	Military Demarcation Line
UN	United Nations
USBP	U.S. Border Patrol

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# CHAPTER 1

## INTRODUCTION

Mr. Gorbachev, Open this Gate; Tear Down this Wall!<sup>1</sup>  
— Ronald Reagan, *Remarks at the Bradenburg Gate*

### Background

Current Situation of the Democratic Republic of the Congo



Figure 1. Map of the Democratic Republic of the Congo

*Source:* Encyclopedia Britannica, “The Democratic Republic of Congo,” accessed January 24, 2016, <http://www.britannica.com/place/Democratic-Republic-of-Congo>. Note: The line along the international border of the provinces of Ituri and Nord-Kivu is the potential barrier location.

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<sup>1</sup> American Rhetoric, “Remarks at the Bradenburg Gate,” accessed June 1, 2016, [www.americanrhetoric.com/speeches/ronaldreaganbrandenburggate.htm](http://www.americanrhetoric.com/speeches/ronaldreaganbrandenburggate.htm).

### Essential Information

Congo gained independence from Belgium in 1960. From 1971 to 1997, the country was officially the Republic of Zaire, a change made by then ruler General Mobutu Sese Seko to give the country what he thought was a more authentic African name. “Zaire” is a variation of a term meaning “great river” in local African languages; like the country’s current name, it refers to the Congo River, which drains a large basin that lies mostly in the republic. Unlike Zaire, however, the name Congo has origins in the colonial period, when Europeans identified the river with the kingdom of the Kongo people, who live near its mouth. Following the overthrow of Mobutu in 1997, the country’s name prior to 1971, the Democratic Republic of the Congo (DRC), was reinstated. Congo subsequently was plunged into a devastating civil war; the conflict officially ended in 2003, although fighting continued in the eastern part of the country.<sup>2</sup>

With 77,433,744 inhabitants according to July 2014 Index Mundi estimates, the DRC is located in central Africa. The second largest country in Africa after Algeria, with 905,355 square miles (2.34 million square kilometers), it is surrounded by nine countries along 10,481 kilometers of boundary. These neighboring countries are: the Republic of Angola (2,646 kilometers) in the west and southwest; the Republic of Congo (Brazzaville, 1,229 kilometers) in the northwest; the Central African Republic (1,747 kilometers) in the north; the South Sudan Republic (714 kilometers) in the northwest; the Republic Uganda (877 kilometers) in the northeast; the Republics of Rwanda (236

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<sup>2</sup> Encyclopedia Britannica, “The Democratic Republic of Congo,” accessed January 24, 2016, <http://www.britannica.com/place/Democratic-Republic-of-Congo>.

kilometers), Burundi (236 kilometers), and Tanzania (479 kilometers) south of Uganda; and the Republic of Zambia (2,332 kilometers) in the southeast.<sup>3</sup>

The DRC is one of the richest countries in the world with a long list of mineral resources like diamond, copper, gold, cobalt, wood products, crude oil, coal, zinc, manganese, coltan, uranium, a flourishing flora, and a diversified fauna. The DRC's geological potentiality exposes the country to foreign jealousies, and by the way, put its security at the stake.<sup>4</sup>

The capital city, Kinshasa, located in the northwest part of the country is also the administrative capital of twenty-six provinces. These provinces are: the Congo central, Kinshasa, Equateur, Sud-Ubangi, Nord-Ubangi, Mongala, Bas-Uele, Haut-Uele, Tshopo, Tshuapa, Inongo, Kwilu, Kasai, Sankuru, Maniema, Sud-Kivu, Kasai central, Kasai oriental, Lomami, Haut-Lomami, Tanganyika, Lualaba, Haut-Katanga, and Nord-Kivu and Ituri, the two provinces covered in this thesis.

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<sup>3</sup> Encyclopedia of Earth, "The Geography of the Democratic Republic of Congo," accessed January 24, 2016, [www.eoearth.org/view/article/151683](http://www.eoearth.org/view/article/151683).

<sup>4</sup> Encyclopedia of Earth, "The Democratic Republic of Congo," accessed January 24, 2016, <http://www.eoearth.org/view/article/151683>.

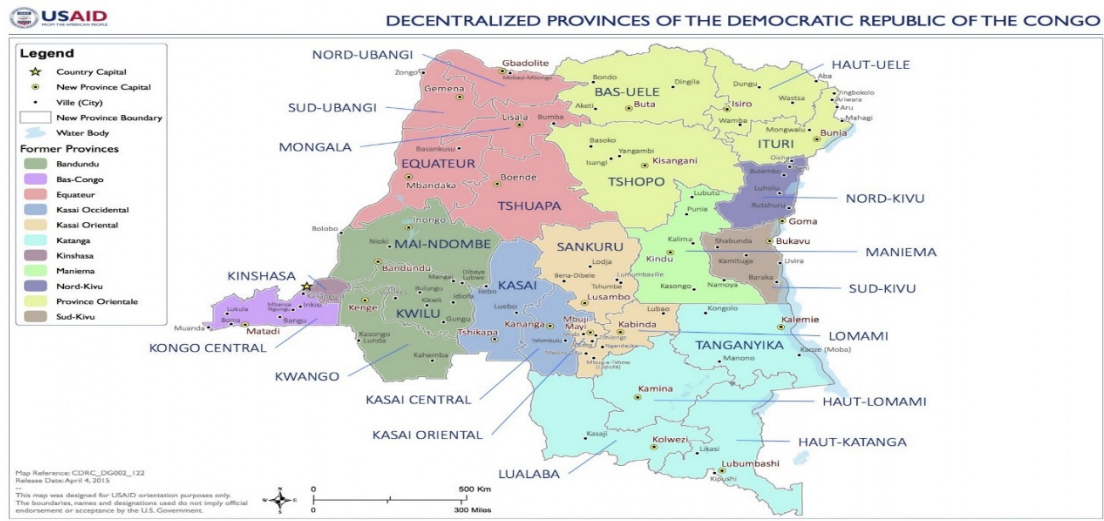


Figure 2. Province of the Democratic Republic of the Congo

Source: Encyclopedia of Earth, “The Democratic Republic of Congo,” accessed January 24, 2016, <http://www.eoearth.org/view/article/151683>.

### The Internal Conflict

After the Cold War, Zaire ceased to be of interest to the United States. Thus, when in 1997, neighboring Rwanda invaded it to flush out extremist Hutu militias, it gave a boost to the anti-Mobutu rebels, who quickly captured the capital, Kinshasa, installed Laurent Kabila as president and renamed the country DRC.

A vast country with immense economic resources, the DRC has until recently been at the center of what some observers call “Africa’s world war,” with widespread

civilian suffering the result.<sup>5</sup> The five-year conflict pitted government forces, supported by Angola, Namibia, and Zimbabwe, against rebels backed by Uganda and Rwanda.

Nevertheless, DRC's troubles continued. A rift between Mr. Kabila and his former allies sparked a new rebellion, backed by Rwanda and Uganda. Angola, Namibia and Zimbabwe took Kabila's side, turning the country into a vast battleground. Coup attempts and sporadic violence heralded renewed fighting in the eastern part of the country in 2008. Rwandan Hutu militias clashed with government forces in April, displacing thousands of civilians. Despite a peace deal and the formation of a transitional government in 2003, people in the east of the country remain in fear of continuing death, rape, or displacement by marauding militias and the army.

The war claimed an up to six million lives, either as a direct result of fighting or because of disease and malnutrition. The war had an economic as well as a political side. Fighting was fueled by the country's vast mineral wealth, with all sides taking advantage of the anarchy to plunder natural resources, and some small militias still fight.<sup>6</sup>

#### The Provinces of Ituri and Nord-Kivu

The provinces of Ituri and Nord-Kivu share a 1,098 kilometers porous boundary with the Republics of Uganda and Rwanda in the north and northeast of the DRC. These two provinces are the most volatile of the eastern part of the country and thus require more focus from the international community and the Congolese leadership in order to

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<sup>5</sup> BBC News, "The Democratic Republic of Congo," accessed January 25, 2016, <http://www.bbc.com/news/world-africa-1328212>.

<sup>6</sup> IRIN, "Armed Groups in Eastern DRC," October 31, 2013, accessed January 24, 2016, [http://www.irinnews.org/report/99037/briefing\\_armed](http://www.irinnews.org/report/99037/briefing_armed).

bring stability and allow the fragile population to work for their development and preserve a part of the second ecosystem in the world after the Amazon. Moreover, they are rich in mineral resources which explains to some extent the volatility of this part of the country, which is one of the topics of this thesis. The ongoing conflict in Ituri, DRC, has led to more than 50,000 deaths, more than 500,000 displaced civilians and continuing, unacceptably high, mortality since 1999.<sup>7</sup> The fighting, which began on October 25, uprooted 250,000 civilians—bringing the total of people displaced by the Kivu conflict to more than two million.<sup>8</sup>

Ituri, in the north of Nord-Kivu, with 65,658 square kilometers, and 4,241,236 inhabitants, is located in the equatorial zone and as a consequence, the equatorial forest is the dominant vegetation that covers its plateau, mountains, and disparate savannahs. Its fauna is one of the most important in the world with the Okapi, a rare antelope found only in the DRC. In former times of peace, tourists came from all over the world to visit this precious species and contributed to the prosperity of the economy of the country. In this province, the Office of Kilo and Moto, exploits the gold mines of Kilo Moto.

Nord-Kivu, with 59,483 square kilometers, and 231,952 inhabitants also benefits the equatorial climate and vegetation in the north, but the south is located in the tropical zone with savannah landscapes and tropical forests on high lands where herds of mountain gorillas live. Likewise, the gorillas attract tourists and the coltan mineral

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<sup>7</sup> NBCI, “Victims of Conflict in Ituri,” accessed January 24, 2016, <http://www.nbc.nlm.nih.gov/pubmed/19153907>.

<sup>8</sup> Free Encyclopedia, “Idps Nord Kivu,” accessed January 24, 2016, <http://en.wikipedia.org/wiki/2008-Nord-Kivu-com>.

dealers in this province for its development and that of the DRC. As state previously, these two provinces are very important and need more and more effort to stabilize and thus contribute to the prosperity of the DRC.

### Purpose

The purpose of this research is to provide an additional approach to the military activities the Forces of the Democratic Republic of Congo (FARDC) conduct in Ituri and Nord-Kivu. The research hypothesis is in order to improve the security, they need to build a barrier to deter hostile activities to and from neighboring Uganda and Rwanda. This will also deter any support of rebellions and local militias from these countries, leading to their defeat and ensuring the stability of the eastern part of the DRC. Stability and peace will put people to work. Work will allow them to satisfy their vital needs. On the other side, it will end or mitigate arms and economic goods smuggling along the border with the two countries. It will also address the question of blood minerals, and improve the economy of the DRC.

### Main Issues

The resources that the government of the DRC allocates for military operations could be invested for the economic or social development of the country. The physical and social trauma caused by war crimes including the killings, rapes, casualties, and internally displaced persons (IDPs), and refugees make this an important social and political problem to solve. The systematic plunder of mineral resources at the detriment to the economy of the DRC illustrates the economic imperative to solve this border defense problem. The diplomatic and social tension between the DRC, Rwanda, and

Uganda remains a persistent impediment to long-term political stability in the region. Lastly, the uncertainty for the future compounds the need to find an effective resolution.

### Problem Statement

Research will address the complex security environment of the northeastern part of the D R C. This complex security environment comprises foreign rebel groups, local militias, sporadic insurgencies against the central government, and Rwandan and Ugandan support and troops incursions, making the control of the eastern part of the country almost impossible for more than a decade. Taking into account the spectrum of offensive operations that the regular forces conduct, and peace talks at the national level and diplomatic meetings at the international level, a defensive barrier would be necessary to positively affect the social, diplomatic, military, economic, and ecological aspects.

### Research Questions

The primary question is, is a strategic barrier at the international border with the DRC feasible, suitable, and acceptable in order to improve security in the northeastern part of the DRC?

The secondary questions are: (1) What are the advantages and the disadvantages of the different sort of barriers; (2) What are the screening criteria and how do they apply; (3) What are the evaluating criteria for feasibility, suitability, and acceptability; (4) What are the feasible, suitable, and acceptable types of barriers; (5) How long is the barrier and where should the barrier be located; and (6) What are the resource requirements for the various barrier options; (7) Who are the chief decision maker (CDM) and the stakeholders and how are they affected by the problem?

## Facts and Assumptions

### Facts

The northeastern border of the DRC is porous. As a result, some foreign armed groups and local militias spread terror and chaos on their paths. These include the Democratic Forces for the Liberation of Rwanda, the Allied Democratic Forces, Lord Resistance Army, and the Mai-Mai groups. They operate in a volatile area which comprises the provinces of North Kivu and Ituri.

Not only do these negative forces destabilize this area, but more often than not, Rwandan and Ugandan troops have violated the integrity of the country in support of rebel groups such as the *Rassemblement Congolais pour la Democratie*, the National Congress for the Defense of the People, and the *Movement du 23* (M23; 2,000 combatants) against the central government. In addition to the M23, which is the metamorphosis of the *Rassemblement Congolais pour la Democratie* Goma and the National Congress for the Defense of the People, numerous armed groups have been active in North Kivu, including the Democratic Forces for the Liberation of Rwanda (1,500 combatants), Ugandan Allied Democratic Forces (1,200-1,500 combatants), Hutu-led armed groups such as Mai-Mai Nyatura, Local Defence Forces Busumba (fifty combatants), and others like the Nduma Defence of Congo (150-180 combatants), Mai-Mai Hilaire (300 combatants), Mai-Mai Kifuafua, and Raiya Mutomboki.<sup>9</sup>

In Ituri the bulk of approximately 15,000 members of armed groups includes the *Front des Nationalistes Intégrationnistes*, the *Union des Patriotes Congolais*, the *Parti*

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<sup>9</sup> IRIN, “The Armed Groups in Eastern DRC.”

*de l'Unité et la Sauvegarde de l'Intégrité du Congo*, the *Forces Armées du Peuple Congolais*, the *Front Populaire pour la Démocratie au Congo* and the *Front de Résistance Populaire de l'Ituri*.<sup>10</sup>

In early 2013 the United Nations (UN) secured a regional agreement to end the M23 rebellion in eastern areas, and the group's alleged founder Bosco Ntaganda surrendered to the International Criminal Court to face war crimes charges. Rwanda and Uganda denied UN accusations that they had supported the M23 group, but the region remains volatile.<sup>11</sup> Despite the gigantic efforts of regular forces, the FARDC supported by UN troops to restore peace and security in that area, the situation remains so critical that it requires creative initiatives and inspirations in defensive warfare to address it.

#### Assumptions

In order to proceed with the development of this argument, the following assumptions are made. They are both necessary and sufficient in order to proceed with the inquiry.

1. A wall or a fence along that border would improve the security conditions, given that in space and time, some people have addressed the similar problem by building the Great Wall of China, the U.S./Mexico fence, the Berlin Wall, the Korean Demilitarized Zone (DMZ), the Ho Chi Min Trail electric fence, and in Mozambique and Cambodia, the mine warfare deniability.

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<sup>10</sup> NBCI, "Victims of Conflict in Ituri," accessed January 24, 2016, <http://www.nbc.nlm.nih.gov/pubmed/19153907>.

<sup>11</sup> BBC News, "The Democratic Republic of Congo."

2. The barrier will restrict or deter illegal activities such as Ugandan and Rwandan military incursion and support to armed groups, and arms and economic goods smuggling. Trade may drop in the beginning as illegal activities drop and legal trading slowly increases.
3. Helicopter, foot, and mounted patrols, and sensors will improve the effectiveness of either the fence or the wall made of concrete materials or against the DNZ at the border.
4. Without regime change in Rwanda and Uganda, they will constitute a threat to the DRC.
5. The relationship between the DRC and Rwanda and Uganda may improve, and the barrier may be destroyed or dismantled.
6. The project of the barrier will draw Rwanda and Uganda to respond to a durable solution.
7. Rwanda, Uganda, and the DRC may constitute a powerful regional organization like the former Community of Countries of the Great Lakes.
8. As neighbors, it is advantageous for these countries to improve their relationship.

#### Definition of Terms

These terms are defined here as they will be used throughout the paper.

Barrier: a fence or other obstacle that prevents movement or access.<sup>12</sup>

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<sup>12</sup> Thesaurus.com, “Barrier,” accessed January 25, 2016, [www.thesaurus.com/browse/barrier](http://www.thesaurus.com/browse/barrier).

Border: the part of a surface that is nearest to its boundary, although it may also refer to the boundary line itself.<sup>13</sup>

Security: the state of being protected or safe from harm; things done to make people or places safe.<sup>14</sup>

### Limitations

To conduct the study on this thesis, the researcher has encountered time constraints due to the rigor and academic requirements of the U.S. Army Command and General Staff College. The lack of books dealing with the situation in the eastern part of the DRC in the Combined Arms Research Library is a limiting factor. In his research, he has also been limited by a lack of experience with the English language. Poor knowledge of informatics has also limited the speed of research. Finally, the complexity and ambiguity of the problem, and the insistence on building a barrier may seem a bias to many people, whereas theoretically there are other solutions such as using diplomacy, but it proved to be a failure for many political reasons that are not evoked.

### Scope and Delimitations

Physically, this study includes only the provinces of Ituri and Nord-Kivu which share borders with Rwanda and Uganda. These international borders are the most volatile and dangerous in the eastern part of the country. It will thus assess the feasibility, suitability, and acceptability of a wall, an electrified fence, or a DMZ. Their cost and the

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<sup>13</sup> Thesaurus.com, “Border.”

<sup>14</sup> Thesaurus.com, “Security.”

time to build as well as other factors such as the advantage and inconvenient of destroying or dismantling it if relationships improve in the long term are used as criteria of selection of the likely barrier to build. The barrier will exclude the water boundary of Lakes Albert and Edward, which are natural water obstacles. This study will not describe or assess the political aspect of the problem because of its sensitiveness.

### Significance of the Study

Even with strong internal popular support, insurgencies cannot survive without external support. Thus, the results of this study could be used to improve military effectiveness in providing a way, a barrier to deter foreign incursions and covert support to rebellions and militias within the northeastern part of the DRC. The barrier will help the Congolese security forces monitor foreign troops movements along the borders through foot, mounted, and air patrols, sensors, and radars. As a result, the armed groups will be isolated and defeated, and the barrier will provide long-term stability to the area.

In solving the problem of minerals plunder, arms and economic goods smuggling, stability will help return IDPs and refugees to their villages and work and improve their economic conditions. Finally, the results will advance scholarship in providing an additional source or reference to further research.

### Summary and Conclusions

The Ituri and Nord-Kivu international borders are porous, so Rwanda and Uganda conduct military incursions and support illegal armed groups in these provinces. As a result, mineral the plunder of mineral resources and the humanitarian conditions are so critical that it needs a creative approach in addition to offensive operations to defeat them

and stabilize the area. A barrier at the border of Ituri and Nord-Kivu would improve the security in the northeastern part of the DRC by deterring incursions and support from Rwanda and Uganda to Armed groups. It would cut their retreat to have safe havens and reorganize in these two countries. Without external support, these groups will be defeated by the FARDC and the UN multinational forces. As will be demonstrated in chapter 4, a fence would be the best barrier in this case, because in addition to the low cost and the short amount of time for building, it can be dismantled if the relationship improves for the long term and the materials may be used for other missions. A wall would be expensive, take a long time to build, and either stay permanently or be destroyed once the relationship improves. Its destruction would constitute a deficit and loss of resources that were used in the construction. A DMZ will also be very expensive because it will require numerous resources for the UN military observers to stay indefinitely in the country.

## CHAPTER 2

### LITERATURE REVIEW

#### Introduction

The purpose of this research is to provide an additional approach to the military activities the FARDC conduct in Ituri and Nord-Kivu. The research hypothesis is that in order to improve security, they need to build a barrier to deter hostile activities to and from neighboring Uganda and Rwanda. This will also deter any support of rebellions and local militias from these countries, leading to their defeat and ensuring the stability of the eastern part of the DRC. Stability and peace will put people to work. Work will allow them to satisfy their vital needs. On the other side, it will end or mitigate arms and economic goods smuggling along the border with the two countries. It will also solve the question of blood minerals, and improve the economy of the DRC.

This chapter is organized into three sections. The first section presents is the introduction. The second section will provide the background of the problem and information on barriers that have been built to address the problem. The Great Wall of China and the Berlin Wall and inter-German border will be discussed first, followed by the Ho chi Min Trail electric fence, and the Mozambique and Cambodia mine warfare deniability. The third type of barrier discussed will be the United States/Mexico fence or wall and Israeli-Palestinian border fence. The final section will provide a summary and conclusions that will help frame chapter 4, which describes the results of the analysis.

## Background

Landmark peace agreements signed in 2002 by eleven African governments and various non-state armed groups were meant to end seven years of war that had ravaged Africa's Great Lakes region. A decade later, instability, tightly intertwined with regional geopolitics, persists. Recurring conflict has killed tens of thousands, mostly civilians, and displaced millions of others. The extended instability has also led to a collapse of basic social services and economic activity in parts of the DRC, resulting in many more deaths due to malnutrition, lack of access to basic healthcare, and scarce opportunities for livelihood. Amid this breakdown, barbaric forms of violence have emerged. During one four-day period in the summer of 2011, nearly 400 women, men, and children were raped by militia fighters. Since 1996, there have reportedly been more than 200,000 rapes, which are mostly attributed to armed militias.

Sponsored militias in the eastern DRC, feed the proliferation of armed groups, and remain a persistent security threat. Nearly all of the illicit traffic in Congolese minerals that funds armed groups transiting Burundi, Rwanda, and Uganda. Despite numerous initiatives and agreements, no comprehensive framework to end this complex conflict has been forged. Rather, international engagement has continued to be fragmented with an emphasis on symptoms. Costs to the international community in peacekeeping and humanitarian assistance alone total more than \$2 billion annually. The persistent state of crisis, similarly, constrains economic investment in Burundi, Rwanda, and Uganda. Moreover, instability in the Great Lakes hinders other security challenges in the region, including state building efforts in South Sudan and defeating the Lord's Resistance Army militia. "Rwanda's 1996 invasion of the eastern Congo set a pattern of

conflict that has since repeated itself . . . [Various state] actors have had little incentive to end their reliance on short-term military responses and proxy militias to meet their immediate security and economic interests . . . Nor can the peace process in the DRC be separated from the broader context of democratization in the Great Lakes region.”<sup>15</sup>

The prospects for peace in the DRC will fundamentally depend on the development of an inclusive approach that combines the security and economic interests of the various local and regional actors in the Great Lakes. A fire cannot be extinguished without bothering to identify the arsonist, understand his intentions, ascertain his plan and his methods, or institute measures to ensure he does not repeat his crime. Moreover, none of this work can succeed without a sustained effort to rebuild a functioning, legitimate state in the DRC. At the end of the day, it is up to the Congolese to assume leadership over their territory so as to ensure security in the Great Lakes.<sup>16</sup>

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<sup>15</sup> Bihuzo, Rigobert Minani. “Unfinished Business: A Framework for Peace in the Great Lakes,” *Africa Center for Strategic Studies* (2012): 8, accessed January 24, 2016, [https://www.files.ethz.ch/isn/147787/AfricaBriefFinal\\_21.pdf](https://www.files.ethz.ch/isn/147787/AfricaBriefFinal_21.pdf).

<sup>16</sup> Ibid.

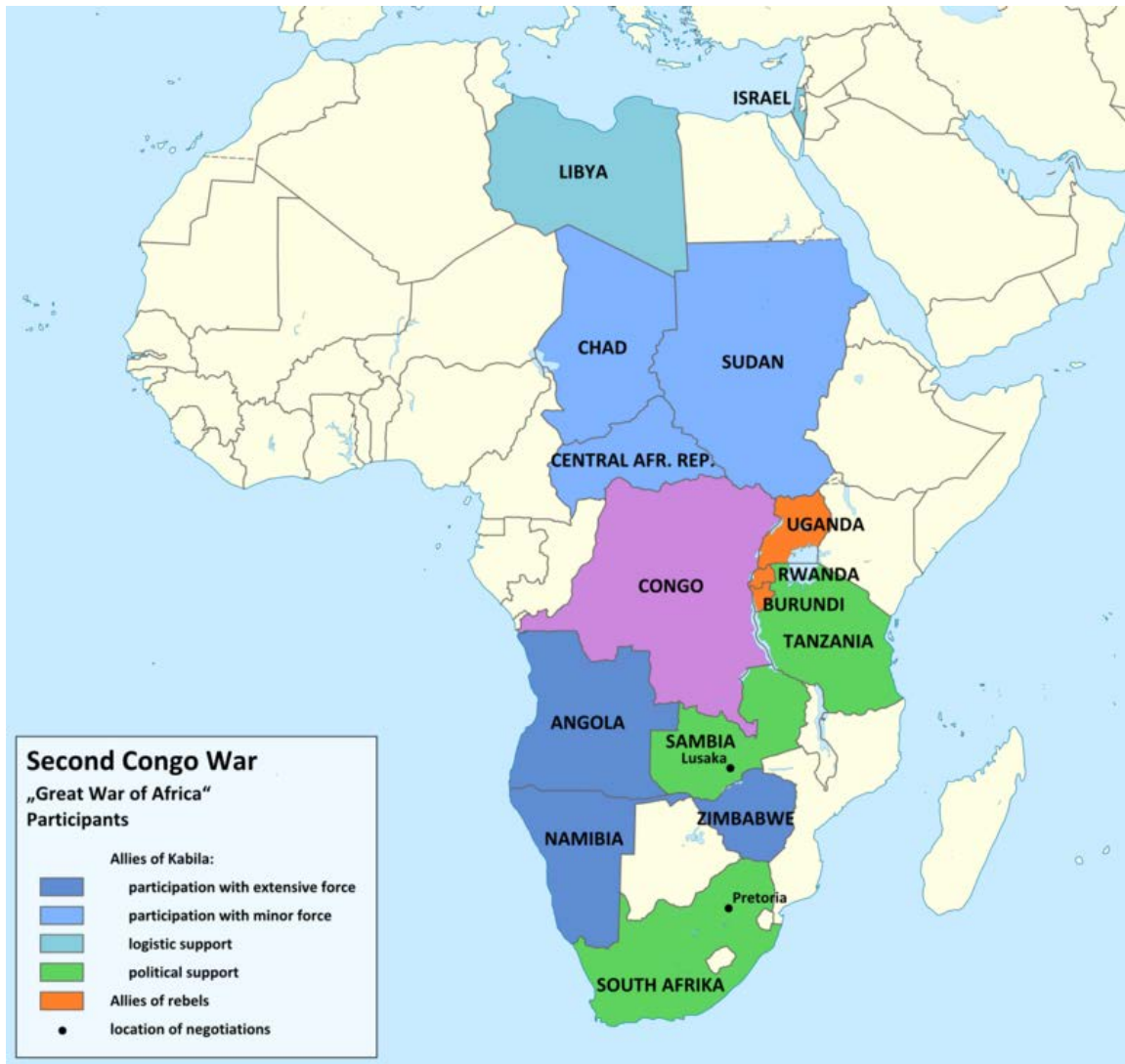


Figure 3. Historic Barriers

Source: Bihuzo, Rigobert Minani. “Unfinished Business: A Framework for Peace in the Great Lakes,” *Africa Center for Strategic Studies* (2012), accessed January 24, 2016, [https://www.files.ethz.ch/isn/147787/AfricaBriefFinal\\_21.pdf](https://www.files.ethz.ch/isn/147787/AfricaBriefFinal_21.pdf).

### The Great Wall of China and the Berlin Wall and Border Fence

In circa 220 BC, under Qin Shi Huang, sections of earlier fortifications were joined together to form a united defense system against invasions from the north.

Construction continued up to the Ming Dynasty (1368-1644), when the Great Wall became the world's largest military structure. Its historic and strategic importance is matched only by its fame. The Great Wall was continuously built from the third century BC to the seventeenth century AD on the northern border of the country as the great military defense project of successive Chinese empires, with a total length of more than 20,000 kilometers. The Great Wall begins in the east at Shanhaiguan in Hebei province and ends at Jiayuguan in Gansu province to the west. Its main body consists of walls, horse tracks, watch towers, and shelters on the wall, and includes fortresses and passes along the wall.

The Great Wall reflects collision and exchanges between agricultural civilizations and nomadic civilizations in ancient China. It provides significant physical evidence of the far-sighted political strategic thinking and mighty military and national defense forces of central empires in ancient China, and is an outstanding example of the superb military architecture, technology, and art of ancient China. It embodies unparalleled significance as the national symbol for safeguarding the security of the country and its people.

The Great Wall of the Ming is, not only because of the ambitious character of the undertaking but also the perfection of its construction, an absolute masterpiece. The only work built by human hands on this planet that can be seen from the moon, the wall constitutes, on the vast scale of a continent, a perfect example of architecture integrated into the landscape.

During the Chunqiu period, the Chinese imposed their models of construction and organization of space in building the defense works along the northern frontier. The

spread of Sinicism was accentuated by the population transfers necessitated by the Great Wall.

The Great Wall bears exceptional testimony to the civilizations of ancient China. It illustrates the rammed-earth sections of fortifications dating from the Western Han that are conserved in the Gansu province as by the admirable and universally acclaimed masonry of the Ming period. This complex and diachronic cultural property is an outstanding and unique example of a military architectural ensemble which served a single strategic purpose for 2000 years. It has a construction history that illustrates successive advances in defense techniques and adaptation to changing political contexts.

The Great Wall has an incomparable symbolic significance in the history of China. Its purpose was to protect China from outside aggression, but also to preserve its culture from the customs of foreign barbarians. Because its construction implied suffering, it is one of the essential references in Chinese literature, being found in works like the “Soldier’s Ballad” of Tch’en Lin (circa 200 AD) or the poems of Tu Fu (712-770) and the popular novels of the Ming period.

The Great Wall integrally preserves all the material and spiritual elements and historical and cultural information that carry its outstanding universal value. The complete route of the Great Wall over 20,000 kilometers, as well as elements constructed in different historical periods which constitute the complicated defense system of the property, including walls, fortresses, passes and beacon towers, have been preserved to the present day. The building methods of the Great Wall in different times and places have been integrally maintained, while the unparalleled national and cultural significance of the Great Wall to China is still recognized today. The visual integrity of the wall at

Badaling has been impacted negatively by construction of tourist facilities and a cable car.

The various components of the Great Wall have all been listed as state or provincial priority protected sites under the Law of the People's Republic of China on the Protection of Cultural Relics. The Regulations on the Protection of the Great Wall promulgated in 2006 is the specific legal document for the conservation and management of the Great Wall. The series of Great Wall Conservation Plans, which is being constantly extended and improved and covers various levels from master plan to provincial plans and specific plans, is an important guarantee of the comprehensive conservation and management of the Great Wall. China's national administration on cultural heritage, and provincial cultural heritage administrations where sections of the Great Wall are located, are responsible for guiding the local governments on the implementation of conservation and management measures for the Great Wall.

The Outstanding Universal Value of the Great Wall and all its attributes must be protected as a whole, so as to fulfill authentic, integral and permanent preservation of the property. To this end, considering the characteristics of the Great Wall, including its massive scale, trans-provincial distribution and complicated conditions for its protection and conservation, management procedures and regulations, conservation interventions for the original fabric and setting, and tourism management shall be more systematic, scientific, classified, and prioritized. An efficient comprehensive management system, as well as specific conservation measures for the original fabric and setting will be established, while a harmonious relationship featuring sustainable development between heritage protection and social economy and culture can be formed. Meanwhile, the study

and dissemination of the rich connotation of the property's Outstanding Universal Value shall be enhanced, so as to fully and sustainably realize the social and cultural benefits of the Great Wall.<sup>17</sup>

The Iron Curtain refers to the boundary that divided Europe politically and militarily from the end of World War II until the end of the Cold War. Geographically, the borderline ran from Estonia in the north to Yugoslavia in the south. Churchill's famous 1946 address, which is sometimes referred to as the "Iron Curtain Speech," is regarded as marking the commencement of the Cold War between the democratic Western world and the Communist Eastern bloc with the Soviet Union as its political center. Between 1946 and 1989, the existence of this symbolic boundary forced many Central and Eastern European countries to join the Communist bloc under the control of the Soviet Union. These countries—Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, and (until the 1960s) Albania—were labeled "Iron Curtain countries."

The Iron Curtain was manned and defended militarily against the West by the Warsaw Pact, which combined the Soviet Red Army and troops from the new Communist one-party states after the end of World War II. It also served as a wall to prevent citizens of Eastern bloc countries from migrating west. In Berlin, the section of the iron curtain dividing West from East Germany took the form of the Berlin Wall, a long concrete wall separating Berlin into democratic and Communist parts; many East Germans lost their lives trying to escape over the wall to the West. In other areas, the iron

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<sup>17</sup> United Nations Educational, Scientific and Cultural Organization, "The Great Wall-UNESCO World Heritage Center," accessed March 9, 2016, <http://whc.unesco.org/en/list/438>.

curtain was constructed of nearly impenetrable steel fencing, creating a long and narrow strip of no-man's-land of untouched wildlife.

The Iron Curtain was finally lifted on June 27, 1989, at the border between Austria and Hungary by the foreign ministers Gyula Horn (Hungary) and Alois Mock (Austria), forty-three years after Churchill's historic speech. This first crack in the long border between the free world and the Communist world was the beginning of the final collapse of communism in November and December 1989, and the first sign of the fall of the Soviet Union in 1991. The fall of the Iron Curtain coincided with the end of the Cold War, signifying the end of a crucial and dramatic period of European and world history.<sup>18</sup>

The Great Wall of China and the Iron Curtain are good examples for this thesis because they both represent an imposing physical barrier built at great cost to society. They allowed for the application of screening criteria and then feasible / acceptable / suitable (FAS) evaluation criteria to test for viability of courses of action.

#### The Border Minefield of Mozambique and Cambodia

Between 1974 and 1979, Rhodesia spent almost Rh\$10 million (around US\$76 million today) establishing a series of minefields along its border with Mozambique, to prevent infiltration and attacks from Zimbabwean liberation fighters of the Zimbabwe African National Liberation Army (ZANLA) and Zimbabwe People's Revolutionary Army (ZIPRA) resistance movements, based in Mozambique. The first layer of these barrier minefields, known as the Cordon Sanitaire, were devised to kill, and consisted of

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<sup>18</sup> Encyclopedia.Com, "The Iron Curtain," accessed March 9, 2016, [http://www.encyclopedia.com/topic/Iron\\_curtain.aspx](http://www.encyclopedia.com/topic/Iron_curtain.aspx).

3,000 to 5,000 mines per linear kilometre stretching along great tracts of the Mozambican/Zimbabwean border. While the vast majority of the minefield was laid inside Zimbabwe, significant portions crossed into Mozambique.

From 2012 to 2014, The HALO Trust was tasked with clearing the three largest sections of the Cordon Sanitaire minefield inside Mozambique, in the Magoé and Changara districts of Tete Province; these minefields had long been a source of danger and insecurity for the communities living in their shadow.

Despite the remote nature of these communities, there is extensive agricultural activity in the area. People regularly cross the border for trade, to access resources or simply to visit family. Those living on both sides of the border share deep ethnic and cultural ties that do not recognize international frontiers. In the region that the HALO Trust was tasked with clearing, eleven of the twelve Mozambican communities visited by the HALO Trust's Community Outreach Team reported deaths and injuries caused by the minefield. Nine people died, thirty-five were injured and 1,545 cattle were lost. Many of the deaths occurred as the population was transiting the border to access water, markets or schools, or to reach land for farming and grazing. With one cow costing around US\$200 in Mozambique and almost US\$500 in Zimbabwe, the animal deaths alone can be said to have cost the local population between US\$309,000 and US\$772,500. In Mozambique, where gross domestic product (GDP) per capita was at approximately US\$450 in 2014, such losses drastically reduce the financial security of rural households and can lead to a downward cycle into severe poverty.

Over two years, the HALO Trust cleared 644,477 square miles of minefield and safely destroyed 36,419 mines benefitting more than 28,000<sup>19</sup> local people (54 percent of which were children). The HALO Trust did not only clear minefields. Four boreholes were also installed in the area to support the demining teams. The boreholes have proven to be an invaluable resource, making clean water more accessible for 634 people and 145 cattle. The boreholes, which provide on average 118 litres of water per week for drinking, cooking and washing, also aid sanitation and health practices. To help teams reach the minefields, the HALO Trust repaired canals and bridges and engaged a community team from Muzunga to improve seven kilometres of road. This improved transport links and access to market and resources. Importantly, the completion of clearance by the HALO Trust in November 2014 allowed the Mozambican government to declare Tete Province landmine free at the end of the year.

The HALO Trust's post-clearance monitoring and evaluation processes revealed that eleven of the twelve impacted communities had started using the former minefield within one to two months of clearance. The communities' initial plans for the cleared land are for farming and grazing livestock, which could generate an annual income ranging from US\$142,510-US\$354,750. The value is higher when activities where the numerical benefit is harder to calculate such as housing and foraging are included.<sup>20</sup>

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<sup>19</sup> This number does not take into consideration those living on the Zimbabwe side of the border.

<sup>20</sup> The HALO Trust, "Mozambique-Clearing Mined Borders/halo Trust," accessed March 9, 2016, <http://www.halo-trust.org/case/Mozambique-clearing-mine-border/>.

Today, the government in Mozambique announces that the country is now ‘mine free.’ Mozambique’s fifteen-year civil war claimed around one million lives. Approximately five million people fled their homes and Mozambique became one of the most mined countries in the world. As a result, hundreds of people were injured and killed by landmines in the 1990s. More than two decades later, Mozambique is now free of this dangerous legacy. The HALO Trust has been clearing mines in Mozambique for twenty-two years. During that time, there have been employed 1,600 Mozambican men and women. Using both manual and mechanical demining methods, there have been cleared over 171,000 landmines from over 1,100 minefields. That’s approximately 80 percent of all the landmines destroyed. Extensive clearance work has unlocked agricultural land, lifted rural communities out of poverty and enabled the development of major infrastructure. Mozambique is now ‘mine free’ but there are many other countries still suffering the legacy of landmines.

Thailand is one of the most popular tourism destinations in the world, yet few people are aware of the extensive landmine problem along the Cambodia, Lao, Malaysian, and Myanmar borders. In addition to the direct implications for victims, the presence of mines prevents access to agriculture land. There is also a threat to food security, which causes an increased pressure on the natural environment.

Thailand’s 700-kilometer-long border with Cambodia, used as a base by Cambodian non-state armed groups in the 1980s and 1990s, is the worst affected, accounting for three-quarters of the estimated contamination and fifty-one of its sixty-nine high-impacted communities. More than half of the mine incidents in Thailand have occurred on this border. A 2001 Landmine Impact Survey identified 530 communities in

twenty-seven of Thailand's seventy-six provinces and more than 500,000 people as mine-affected. The Landmine Impact Survey estimated the total area of mine contamination at 2,557 kilometers. Thailand's revised Article 5 deadline extension request, submitted in 2008, claimed it had released 1,355 kilometers of this area, leaving a total of 1,202 kilometers of suspected hazardous areas to be released, including an estimated 528.2 kilometers of "real minefield" requiring manual clearance.<sup>21</sup>

The costs of laying mines are low, as little as US\$3 per mine, but the costs of removal are very high, US\$1000 per mine or more. One study, cited on a UN website, noted a particular project in Cambodia where forty-five de-miners worked seven months. They found 265 mines and 943 units of unexploded ordinance. The cost of the project was about US\$378,000, or about US\$1,400 per mine or US\$5 for every square meter of cleared land. About one-third of this money went for international salaries and benefits, 27 percent for radios, computers and other equipment, and 20 percent for metal detectors. Only about 4.5 percent went for local salaries, and 8 percent for local administration.

Minefields were researched as potential border barriers because they represented a different type of barrier with a lower cost. They also are a hidden barrier and are associated with a psychological fear of the unknown. This barrier type also allowed for the application of screening criteria and then feasible / acceptable / suitable (FAS) evaluation criteria to test for viability of courses of action.

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<sup>21</sup> Thailand Detection Landmines Rat-Apopo, accessed March 10, 2016, <https://www.apopo.org/en/mine-action/projects/thailand>.

## The Ho Chi Min Trail

In 1959, The Lao Dong Party's (Communist Party) Central Committee decided to increase support to the Communist insurgency in South Vietnam. On the occasion of Ho Chi Minh's birthday on May 19, 1959, Major General Nguyen Van Vinh instructed the establishment the 559th Transportation Group, under the command of Major Vo Bam. Its objective was to open a supply route beginning in the North, running throughout the country, and ended at the South of Vietnam

Using ancient footpaths that connected North and South Vietnam for centuries, Vo Bam began to construct necessary staging areas, depots, and command posts along the roads. In August 1959, the first supplies from the North containing twenty boxes of rifles and ammunition were delivered to Viet Cong insurgents in Thua Thien Hue. By the end of the year, about 1,800 men had infiltrated into South Vietnam by using the trail. By early 1960s, Hanoi continued to expand the trail. The need for secrecy compelled the North Vietnamese to develop a new route along the western side of Truong Son Range in Laos territory. Training centers were also established at Xuan Mai and Son Loc to instruct soldiers how to camouflage while moving along the roads. Bicycles was introduced and replaced porters on foot; with this change, transport soldiers can carry three or four times the load and move at 1.5 times the speed. At the end of 1963, about 5,000 troops plus an engineering regiment were assigned to maintain the trail, which now stretched for more than 600 miles of well-hidden roads.

In 1965, Hanoi conducted a massive effort to improve the trail. Engineers widened footpaths into flat roads and strengthened bridges to be capable of supporting truck movement. By using truck convoys at night, Hanoi could increase a significant

amount of men and material supplies to South Vietnam. During the dry season of 1965, the United States estimated that more than ninety tons of supplies were transferred to the Viet Cong per day. In 1966 and 1967, as the war became more fierce, the role of Ho Chi Minh Trail became more important. Supplies were now generally transported by trucks moved from station to station at night. During daylight, trucks were hidden and camouflaged. At vulnerable points between stations, People's Army of Vietnam (PAVN) personnel were positioned to repair and maintain the trail and trucks. Refueling facilities were located at every third to fifth station. This system was able to guarantee the continued use of the trail. The increase of supplies being transferred to South Vietnam obviously made U.S. planners think of conducting a major effort to cut off the supply route.

In September 1966, Secretary of Defense, Robert McNamara wrote to President Lyndon B. Johnson describing Ho Chi Minh Trail as "one of our most serious unsolved problems."<sup>22</sup> Beginning with Operation Leaping Lena in 1964, Operation Prairie Fire in 1965, and ending with Operation Shining Brass in 1966, many attempts to disrupt the flow of supplies by using small ground unit proved ineffective. In 1964 and 1965, aerial bombardments of the trail were also conducted as part of Operation Barrel Roll and Operation Rolling Thunder. Nonetheless, those bombings could not slow down the rate of infiltration. After President Johnson announced to suspension of the bombings in North Vietnam, American bombardment began to focus on interdiction. On November 15, 1968, Operation Commando Hunt was conducted as a massive effort to prevent the

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<sup>22</sup> The Vietnam War, "The Ho Chi Minh Trail," accessed March 9, 2016, <http://thevietnamwar.info/ho-chi-minh-trail/>.

transit of PAVN personnel and supplies on the Ho Chi Minh Trail. Over the next five years, more than three million tons of bombs were drop on Laos. Commando Hunt's main target was the truck traffic along the trail. In 1969, 9,012 trucks were destroyed according to the U.S. Air Force; the number grew to 12,368 in the following year.

However, at the same time, the Central Intelligence Agency estimated the total number of trucks in all of North Vietnam was only 6,000. To protect the continuation of the trail, the North Vietnamese increased the number of anti-aircraft artillery, 85-millimeter and 100-millimeter guns were deployed to defend the system. By the end of Operation Commando Hunt, the number of anti-aircraft guns along the trail increased to 1,500. By late 1970, despite heavy bombardments, 8,000 men and 10,000 tons of war material continued to move southward monthly. In the end, none of the U.S. efforts to sever the trail were successful. This meant the war could unlikely be won.

In 1971 and 1972, Operation Lam Son 719 and Operation Commando Hunt VII ended as failures. After the Paris Peace Accords was signed in early 1973, interdiction efforts significantly declined and the trail was extensively improved. By 1973, it became a two-lane highway that ran from the mountain passes of North Vietnam to the Chu Pong Massif in South Vietnam. By 1974, the trail was a four-lane wide route and also boasted four oil pipelines. From 1965 to 1975, Hanoi moved about 1.8 million tons of supplies down the trail. They had won the battle of supply in which the Ho Chi Minh trail had played the vital role.

The Ho Chi Minh Trail represented a third type of barrier with electronic sensors and monitoring by long-range patrols. Having many types of barriers provided much

choice and allowed for the application of screening criteria and then feasible / acceptable / suitable (FAS) evaluation criteria to test for viability of courses of action.

### The Korean Demilitarized Zone

The Korean DMZ, a strip of land running across the Korean Peninsula, serves as a buffer zone between North and South Korea. The DMZ cuts the Korean Peninsula roughly in half, crossing the 38th Parallel on an angle, with the west end of the DMZ lying south of the parallel and the east end lying north of it. The most heavily armed border in the world, the DMZ extends 248 kilometers/155 miles long and approximately four kilometers/2.5 miles wide.

The Berlin Wall and the Korean DMZ along the 38th Parallel have symbolic and practical similarities. While the Berlin Wall stood, the standoff between the Soviet Union and the North Atlantic Treaty Organization remained firm. Once the Berlin Wall collapsed, the Soviet Union and Chinese Communist governments quickly crumbled. North Korea watched the crumbling of the Communist world around it with Russian and China turning from staunch supporter to reluctant historical allies. North Korea has a firm determination to keep the DMZ intact as a guarantee to its dictatorial control of the North and hope of conquering the South.

The 38th Parallel north, which cuts the Korean Peninsula roughly in half, stands as the original boundary between the U.S.-controlled and Communist-controlled areas of Korea at the end of World War II.

Upon the creation of the Democratic People's Republic of Korea and the Republic of Korea in 1948, the DMZ became a de facto international border and one of the tensest fronts in the Cold War.

The North and the South remained heavily dependent on their sponsor states, the Soviet Union and the United States, respectively, from 1948 through the outbreak of the Korean War. The devastating conflict, which claimed over three million lives and saw the Korean Peninsula effectively divided along ideological lines, commenced on June 25, 1950, with a Soviet-sponsored Democratic People's Republic of Korea invasion across the DMZ, and ended in 1953 after international intervention pushed the front of the war back to near the 38th Parallel. In the ceasefire of July 27, 1953, an armistice agreement created the DMZ as each side agreed to move their troops back 2,000 meters from the front line, creating a buffer zone four kilometers wide. The Military Demarcation Line (MDL) goes right down the center of the DMZ and indicates the exact location of the front upon the signing of the agreement. A peace treaty never followed the armistice agreement, leaving the two Koreas technically still at war.

Owing to that stalemate, and genuine hostility between the North and the South, large numbers of troops face each other along both sides of the line. The armistice agreement explains exactly the number of military personnel, and weapons, the South and North may maintain within the DMZ itself. Soldiers from both sides may patrol inside the DMZ, but they may not cross the MDL.

Panmunjom, home of the Joint Security Area (JSA), sits inside the DMZ near the western coast of the peninsula. That constitutes the only place where North and South connect. A number of buildings exist on both the north and the south side of the MDL, a few built right on top of the MDL. The JSA has been the location where all negotiations since 1953 have been held, including a number of statements of Korean solidarity, which have generally amounted to little except a slight decline of tensions. The MDL goes right

through the conference rooms, right down the middle of the conference tables where the North Koreans and the United Nations Command (primarily South Koreans and Americans) meet face to face.

Though generally calm, the DMZ has been the scene of much saber-rattling between the two Koreas over the years. A number of small skirmishes have occurred within the Joint Security Area since 1953. The Axe Murder Incident in August 1976 involved the attempted trimming of a poplar tree which resulted in two deaths and Operation Paul Bunyan. Prior to that, both sides permitted soldiers to go back and forth across the MDL inside of the JSA, a privilege since revoked as a result of that incident.

Another incident occurred later when a Soviet dignitary, part of an official trip to the JSA (hosted by the North), ran across the MDL yelling that he wanted to defect. North Korean troops opened fire and chased him across the line. South Korean troops, protecting the defector, fired back and eventually surrounded the North Koreans. One South Korean soldier died in the incident. The defector expressed joy in his successful attempt, but sadness at the loss of life. Since that incident, the North Korean soldiers face one another so defectors cannot come upon them from behind. They have orders to shoot anyone who attempts to defect before they get to the line.

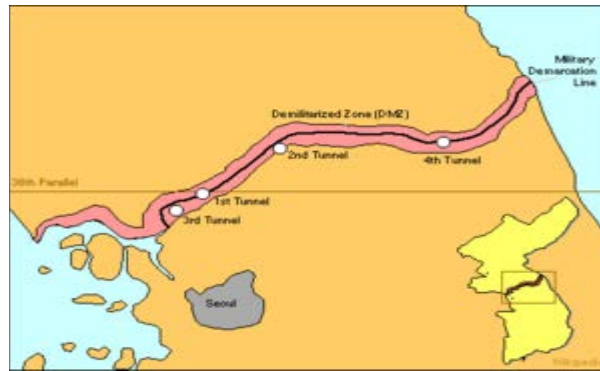


Figure 4. Map of the Korean Demilitarized Zone

*Source:* The Free Encyclopedia, “Korean Demilitarized Zone,” accessed March 10, 2016, [https://en.wikipedia.org/wiki/Korea\\_Demilitarized\\_Zone](https://en.wikipedia.org/wiki/Korea_Demilitarized_Zone). Note: The DMZ is given in red. The demarcation line runs in the middle of the DMZ (black line).

Starting on November 15, 1974, the South discovered four tunnels leading under the DMZ, by use of water-filled pipes dug vertically into the ground near areas of suspected tunneling activity. The first of the tunnels runs forty-five meters below the surface for about 3.5 kilometers, penetrating over 1,000 meters into the DMZ. The first tunnel discovered featured electric lines and lamps, as well as railways and paths for vehicles. The second, discovered on March 19, 1975, runs the same length, laying between fifty and 160 meters below ground. The discovery of the third tunnel occurred on October 17, 1978, as the result of, like the previous two, a tip from a North Korean defector. That tunnel runs about 1,600 meters, laying about 150 meters below ground. The fourth tunnel, discovered on March 3, 1990, has an almost identical structure as the second and the third tunnel.

The north-south directions of the four tunnels, the fact that they do not branch, the progressively more advanced planning of each one (for example, the third tunnel slopes

upward slightly as it progresses southward, so that water does not stagnate), and the orientation of the blasting lines within each one indicate that North Korea dug the tunnels, for the purpose of invasion, and not coal mining, as the North claimed upon their discovery (no coal can be found in the tunnels, dug through granite, but some of the tunnel walls at some point had been painted black to give the appearance of coal). The tunnels have enough room to permit the passage of an entire division in one hour. Today, tourists can visit some of the tunnels as part of guided tours from the South, including the famous tunnel tour, Third Tunnel of Aggression, discovered in the 1970s.

Apart from Panmunjom, the JSA and two model villages, the DMZ serves as home to a wide variety of wild life and countless landmines. Proposals have been forwarded that, following the reunification of Korea, the DMZ remain a wildlife nature preserve. Both Koreas deploy the majority of their military personnel and technology within 160 kilometers of the MDL that runs through the middle of the DMZ. In practical terms that represents over one million troops on either side, plus large numbers of tanks, long-range artillery, and armored personnel carriers. Arguably, the DMZ is the last front of the Cold War.<sup>23</sup>

### The Israeli-Palestinian Barrier

Israel's Separation Barrier, has been dubbed the "Apartheid Wall" or "Berlin Wall" by Palestinians. It has increasingly attracted international media attention, largely due to the hard-to-ignore scale of the project. The most obvious historical parallel to the

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<sup>23</sup> The Free Encyclopedia, "Korean Demilitarized Zone," accessed March 10, 2016, [https://en.wikipedia.org/wiki/Korea\\_Demilitarized\\_Zone](https://en.wikipedia.org/wiki/Korea_Demilitarized_Zone).

barrier is the Berlin Wall, which was ninety-six miles long (155 kilometers). Israel’s barrier, still under construction, is expected to reach at least 403 miles in length (650 kilometers). The average height of the Berlin Wall was 11.8 feet (3.6 meters), compared with the maximum<sup>24</sup> current height of Israel’s Wall—twenty-five feet (eight meters). Israel’s barrier is therefore planned to be four times as long and in places twice as high as the Berlin Wall. It is a dominating architectural artifact that makes a persistent statement about the political tension in the area.

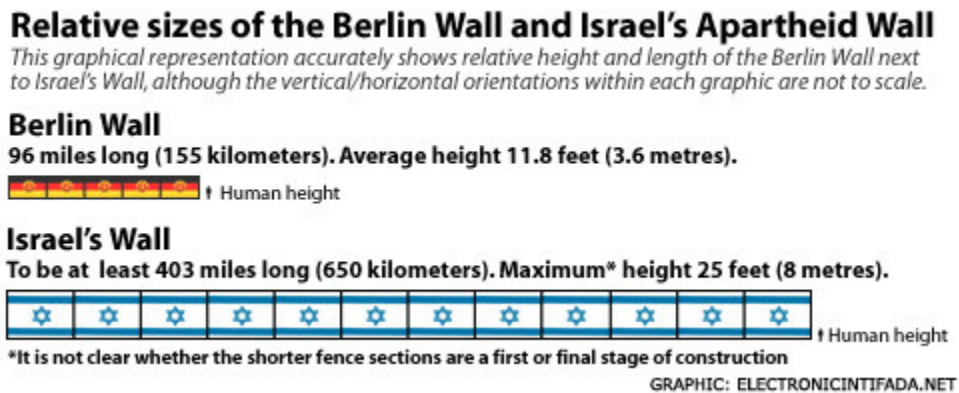


Figure 5. Relative size of Berlin and Israel walls

*Source:* Nigel Parry, “Is it a Fence? Is it a Wall? No, It’s a Separation Barrier,” The Electronic Intifada, accessed January 24, 2016, <https://electronicintifada.net/content/it-fence-it-wall-no-its-separation-barrier/4715>.

Photographs of the barrier available on the wire services show two main types of section—a wall made of concrete or concrete/fence combination, and a fence-only version of the barrier. Some references in the media suggest that the two main forms of

<sup>24</sup> It is not clear whether the shorter fence sections, about six meters in height, are the first or final stages in Israel’s construction of the barrier.

the barrier correspond to differing levels of implementation of security by Israel, with the wall sections reserved for areas perceived as “especially vulnerable,” the fence sections for areas less so.

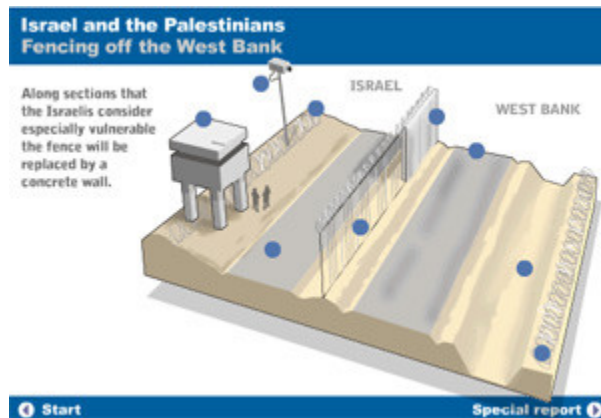


Figure 6. Interactive Wall Graphic

*Source:* Nigel Parry, “Is it a Fence? Is it a Wall? No, It’s a Separation Barrier,” The Electronic Intifada, accessed January 24, 2016, <https://electronicintifada.net/content/it-fence-it-wall-no-its-separation-barrier/4715>.

It is not so simple. In addition to the concrete wall and fencing materials used in the construction of the structure, sections of Israel’s Separation Barrier additionally include electrified fencing, two-meter-deep trenches, roads for patrol vehicles, electronic ground/fence sensors, thermal imaging and video cameras, unmanned aerial vehicles, sniper towers, and razor wire.

At this point in time it is not known exactly what proportions of the length of the barrier is fence versus wall. Furthermore, it is not known if the fence is merely a temporary state until a wall can be built in all areas; but nonetheless, the wall unquestionably represents a considerable portion of the visible manifestation of the

barrier Similarly, in looking at the Palestinian-compiled map of the Israeli barrier plans from the Palestinian Hydrology Group and the Land Research Center,<sup>25</sup> and looking at the route of Israel's Wall, it is clear that the wall does not run along the Green Line that separates Israel proper from the West Bank, but it clearly runs through the West Bank, on Palestinian land.

Both the Korean DMZ and the Israeli-Palestine barriers represented mixed barrier types that employed several obstacle types like fences, mines, sensors, and physical observation and patrolling. Having these types of barriers provided more choice and allowed for the application of screening criteria and then feasible / acceptable / suitable (FAS) evaluation criteria to test for viability of courses of action.

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<sup>25</sup> Nigel Parry, "Is it a Fence? Is it a Wall? No, It's a Separation Barrier," The Electronic Intifada, accessed March 10, 2016, <https://electronicintifada.net/content/it-fence-it-wall-no-its-separation-barrier/4715>.

## The U.S./Mexico Fence



Figure 7. The San Diego Fence

*Source:* U.S. Department of Homeland Security; Environmental Statement for the Completion of the 14-mile Border Infrastructure System in San Diego, California, July 2003.

Within the Department of Homeland Security's (DHS) Customs and Protection (CBP), the U.S. Border Patrol (USBP) is charged with securing the nation's land and maritime borders between official ports of entry to deter and interdict terrorists, weapons of mass destruction, and aliens attempting to enter the country unlawfully. In order to discharge its duties, the USBP deploys personnel, technology, and tactical infrastructure such as vehicle barriers and fencing. Fencing is erected on the border to impede the illegal entry of unauthorized aliens, while vehicle barriers are designed to impede the entry of vehicles but do not impede the entry of individuals. This report will analyze the barriers that are currently being constructed and maintained along the border by the USBP, including historical and future cost estimates and the policy issues involved. Because the current debate has largely focused on the deployment of fencing to the

border, this report will focus on the policy issues surrounding the construction of border fencing. However, information concerning the kinds of vehicle barriers being deployed at the border will be provided where available.

Using the broad powers granted to the Attorney General to control and guard the U.S. border,<sup>1</sup> the USBP began erecting a barrier known as the “primary fence” directly on the border in 1990 to deter illegal entries and drug smuggling in its San Diego, California sector.<sup>2</sup> The San Diego fence formed part of the USBP’s “Prevention Through Deterrence” strategy,<sup>3</sup> which called for reducing unauthorized migration by placing agents and resources directly on the border along population centers in order to deter would-be migrants from entering the country. The San Diego primary fence was completed in 1993, covering the first fourteen miles of the border from the Pacific Ocean. The fence was constructed of ten-foot-high welded steel Army surplus landing mats<sup>4</sup> with the assistance of the Corps of Engineers and the California National Guard. In addition to the fourteen miles of primary fencing erected in its San Diego sector, the USBP maintains stretches of primary fencing in several other sectors along the southwest border, including Yuma and Tucson, Arizona, and El Centro and El Paso, Texas. In 1996, Congress passed the Illegal Immigration Reform and Immigrant Responsibility Act which, among other things, explicitly gave the Attorney General broad authority to construct barriers along the border and authorized the Immigration and Naturalization Service to construct a secondary layer of fencing to buttress the completed fourteen mile primary fence.<sup>5</sup> Construction of the secondary fence stalled after 9.5 miles had been completed due to environmental concerns raised by the California Coastal Commission. In 2005, Congress passed the REAL ID Act which, among other things, authorized the

Secretary of the DHS to waive all legal requirements in order to expedite the construction of border barriers.<sup>6</sup> In addition to border fencing, the USBP deploys both permanent and temporary vehicle barriers at the border. Vehicle barriers are meant to stop the entry of vehicles, but not people, into the United States. Temporary vehicle barriers are typically chained together and can be moved to different locations at the USBP's discretion. Permanent vehicle barriers are embedded in the ground and are meant to remain in one location. The USBP is currently erecting a 150-mile stretch of vehicle barriers in conjunction with the National Park Service near Yuma, Arizona.

The USBP currently uses three main types of barriers along the border: primary fencing immediately on the international border, Sandia fencing behind the primary fencing, and vehicle barriers meant to stop vehicles, but not people on foot, from traversing the border. While other forms of primary fencing, such as bollard fencing<sup>36</sup> and picket fencing,<sup>37</sup> have been constructed in limited areas,<sup>38</sup> to date the agency has largely focused on using the landing mat fencing as a primary fence and the Sandia fence as a secondary fence.

Landing mat fencing is composed of Army surplus carbon steel landing mats which were used to create landing strips during the Vietnam War. The landing mats form panels twelve feet long, twenty inches wide, and one-quarter inch thick, which are welded to steel pipes buried eight feet deep every six feet along the fence. Each mile of fencing requires the use of 3,080 panels. There are about five miles of surplus landing mat fencing remaining as of 2006.<sup>40</sup> According to the USB, sites that feature landing mat fencing include the following USBP stations: Campo, California; Yuma, Nogales, and Naco, and Douglas, Arizona; and El Paso.<sup>41</sup> There are sixty-two miles of landing mat

fencing currently constructed.<sup>42</sup> In a 1999 study, the Corps of Engineers predicted that construction costs for the landing mat fencing would range from \$388,005 to \$431,117 per mile.<sup>43</sup> This estimate includes the cost of materials, despite the fact that the landing mat fencing constructed to date has been comprised of Army surplus panels acquired by CBP at no cost. As previously noted, however, only about five miles of surplus landing mat fencing material remains available. Maintenance costs per year could vary widely depending on the number of breaches the fence undergoes. Low levels of damage to the fence would result in low annual repair costs, while a large number of breaches could result in stretches of fencing needing to be replaced. The Corps of Engineers estimated that yearly maintenance costs would probably range from \$1,742 to \$17,753 per mile.<sup>44</sup> The Corps of Engineers noted that the net present value<sup>45</sup> of the fence after twenty-five years of operation, would range from \$5.4 million and \$8.3 million per mile depending on the amount of damage sustained by the fencing each year.

The secondary fence proposed by the Sandia study has only been constructed over roughly 9.5 miles of the fourteen miles in the original plan due to environmental concerns voiced by the California Coastal Commission. As previously discussed, Public Law 109-13 included language that will allow waiver of all legal requirements determined necessary by the Secretary of DHS for the expeditious construction of authorized barriers and only allows judicial review for constitutional claims. On September 14, 2005, DHS announced it is applying its new waiver authority to complete the San Diego fence.<sup>46</sup> However, construction has not begun on the remaining four miles of the San Diego fence because DHS is in the process of acquiring the necessary land.<sup>47</sup> DHS is currently estimating that it will cost an additional \$66 million to finish the San Diego fence,

bringing overall costs for this fourteen-mile-long project to \$127 million. Additionally, DHS notes that it will use a mix of Department of Defense resources and private contractors to finish the fence, and that the cost of using contractors is included in the request.<sup>48</sup> The Sandia fence, as it has been constructed in the San Diego sector, is a secondary fence constructed behind the primary fence. Enough space is left between the two fences to accommodate an access road. The secondary fence is an angled two-piece fence. The fence is vertical up to ten feet high, and then extends out at an angle towards the climber. This prevents climbing by using gravity and the weight of the climber against them. The Corps of Engineers estimated that Sandia fencing costs would range from \$785,679 to \$872,977 per mile for construction and \$953 to \$7,628 per mile yearly for maintenance. Additionally, the Corps of Engineers study notes that the Sandia fence would possibly need to be replaced in the fifth year of operation and in every fourth year thereafter if man-made damage to the fence was severe and ongoing. For this reason, the Corps of Engineers study noted that the net present value of the fence after twenty-five years of operation would range from \$11.1 million to \$61.6 million per mile.<sup>49</sup>

The USBP utilizes various types of barriers to impede vehicles from crossing into the United States from Mexico. Some of these barriers are temporary and can be moved to different locations when needed, others are permanent barriers. The main purpose of vehicle barriers is to prevent smugglers from easily driving their vehicles across the border.

Permanent vehicle barriers, as their name suggests, are not designed to be moved but rather are permanent installations. Permanent vehicle barriers are typically steel posts, or bollards, that are excavated five feet deep and inserted into a poured concrete base.

The posts alternate in aboveground height in order to dissuade individuals from forming a ramp over the barrier. They are spaced so as to allow foot and animal traffic but not vehicular traffic. The USBP recently began building permanent vehicle barriers in the Yuma sector, with a substantial stretch slated to be built along the Organ Pipe Cactus National Monument. When linked with the thirty miles of vehicle barriers built by the National Park Service, a USBP spokesman reportedly noted that the total 123-mile length of the project “will form the largest continuous physical barrier along the border in the nation.”<sup>50</sup> In the Fiscal Year (FY) 2007 DHS Congressional Budget Justifications, DHS notes that the Yuma vehicle barrier project would take until at least 2010 (and possibly longer) to complete if CBP continued to use the Corps of Engineers and other military personnel to construct the barriers. Instead, CBP proposes hiring commercial contractors to build thirty-nine miles of vehicle barriers in the Yuma sector, or almost half of the project’s 93 mile total.<sup>51</sup> CBP is projecting that the project will be completed by FY2011, and that the overall project costs will be \$116 million.<sup>52</sup> This means that, overall, the project will cost roughly \$1.25 million per mile. The National Park Service has spent \$11.1 million to construct eighteen miles of permanent vehicle barriers in Organ Pipe Cactus National Monument, and has obtained additional \$6.6 million in FY2005 funding to complete the remaining thirteen miles of the project.<sup>53</sup> DHS currently has roughly fifty miles of vehicle barriers deployed along the border.<sup>54</sup> Vehicle barriers have been used in the El Centro, Yuma, Tucson, and El Paso sectors.<sup>55</sup>

Temporary vehicle barriers are typically built from welded metal, such as railroad track, but can also be constructed from telephone poles or pipe. These barriers are built so that they cannot be rolled or moved manually; they can only be moved with a forklift or a

front-end loader. They are usually built at USBP stations and transported to areas of high vehicle entry, where they are placed and chained together.<sup>56</sup> The main advantage of the temporary vehicle barriers is their ability to be redeployed to different areas to address changes in smuggling patterns. The main disadvantage of these barriers is that they are easier to compromise than permanent vehicle barriers.



Figure 8. Examples of U.S. Border Patrol Border Fencing

*Source:* U.S. Department of Justice, “Environmental Assessment for Infrastructure Within U.S. Border Patrol Naco-Douglas Corridor Cochise County, Arizona,” August, 2000, accessed March 4, 2016, [https://www.dhs.gov/xlibrary/assets/nepa/Mgmt\\_NEPA\\_FEA-FONSInfrastructureNacoDouglasaugust2000.pdf](https://www.dhs.gov/xlibrary/assets/nepa/Mgmt_NEPA_FEA-FONSInfrastructureNacoDouglasaugust2000.pdf), 1-13.

There are a number of policy issues that Congress may consider concerning the construction of barriers along the border, including, but not limited to: their effectiveness; their overall costs compared with their benefits; their possible diplomatic ramifications; their unintended consequences; and the locations in which they are to be constructed.

Although these issues apply to all potential barriers at the border, due to the focus on border fencing in the current congressional debate this section will focus its analysis on the potential policy issues surrounding the construction of fencing at the border.

Proponents of border fences point to the substantial reduction in apprehensions along the San Diego sector as tangible proof that fences succeed in reducing cross-border smuggling and migration where they are constructed.<sup>58</sup> Opponents attribute part of the decrease in apprehensions to the increase in manpower and resources in the sector and, pointing to the increase in apprehensions in less-populated sectors, contend that the fence only succeeds in re-routing unauthorized migration and not in stopping it.<sup>59</sup> The USBP, for its part, states that border fencing is a force multiplier because it allows its agents to focus enforcement actions in other areas. The USBP has also stated that the fencing constructed in urban areas has helped reroute unauthorized migration to less populated areas where its agents have a tactical advantage over border crossers. As previously noted, the number of USBP apprehensions in 2004 were almost identical to the number of apprehensions in 1992; the main difference is that while San Diego accounted for the majority of apprehensions in 1992; in 2004, the Tucson and Yuma sectors accounted for the majority of apprehensions. A possible issue for Congress concerns the overall effectiveness of border fencing, especially if it is not constructed across the entire border in question. In the limited urban areas where border fencing has been constructed, it has typically reduced apprehensions. However, there is also strong indication that the fencing, combined with added enforcement, has re-routed illegal immigrants to other less fortified areas of the border. Additionally, in the limited areas where fencing has been erected there have been numerous breaches of the border fencing and a number of tunnels

discovered crossing underneath the fencing. It stands to reason that even if border fencing is constructed over a significant portion of the land border, the incidences of fence breaches and underground tunnels would increase. Possible policy options to address these issues could include mandating that border fencing be highly tamper-resistant or directing CBP to invest in tunnel-detection technologies.

Because border fencing is a relatively new and limited phenomenon along the U.S.-Mexico border, there is a limited amount of information concerning its overall costs and benefits. The Corps of Engineers study predicted that the costs of constructing a double layer fence consisting of primary fencing and Sandia fencing would range from \$1.2 million to \$1.3 million a mile. The Corps of Engineers also predicted that the twenty-five-year life cycle cost of the fence would range from \$16.4 million to \$70 million per mile depending on the amount of damage sustained by the fencing.

If significant portions of the border were to be fenced, reducing the areas along which individuals could cross the border, it may stand to reason that the fencing will be subjected to more breaches and other attempts to compromise than the fencing that has already been constructed. This may mean that the costs of maintaining border fencing that is widely deployed in the future will be higher than they have been thus far for the limited deployment. The corps estimates do not include the costs of acquiring the land or most labor costs, since construction would be done by the Department of Defense; these could well turn out to be significant expenses. The Congressional Budget Office has estimated that border fencing would cost \$3 million a mile to construct.<sup>60</sup> However, the Congressional Budget Office does not elaborate on what is included in that estimate. DHS predicts that the San Diego fence will have a total cost of \$127 million for its

fourteen-mile length when it is completed—roughly \$9 million a mile. However this cost may be somewhat misleading due to the following factors: construction of the fence was delayed for an extended period of time; the remaining construction involves filling a relatively large gulch which may be more complex than the average stretch of border; and DHS is proposing to use private contractors to expedite the construction process which will increase the labor costs and thus the project costs. Some have argued that building fences on the border is too expensive and would consume funding that would be better spent on hiring additional agents or deploying additional technologies to the border.<sup>61</sup> Others maintain that the costs of fencing are negligible compared to the costs of illegal immigration, and that fencing has been proven effective at decreasing illegal immigration in those areas where it has been deployed.<sup>62</sup> The USBP has testified that “for border control, for border security, we need that appropriate mix. It’s not about fences. It’s not about Border Patrol agents. It’s not about technology. It’s about all of those things.”<sup>63</sup> At issue for Congress is how best to allocate scarce border security resources while safeguarding homeland security. Does border fencing represent the best investment of border security funding, and what is the appropriate mix of border security resources? How much will maintaining border fencing cost in the future, and which agency will be responsible for this maintenance? Will using private contractors to expedite the construction of border fencing increase the costs?

Congress mandated the design of the border fence in San Diego in IIRIRA. Many of the bills being considered in the 109th Congress that include fencing provisions also identify the kind of fencing—typically double or triple fencing—that should be constructed. There are many different fence designs that could be deployed to the border,

and each have their relative strengths and weaknesses. Concrete panels, for example, are among the more cost-effective solutions but USBP agents cannot see through this type of fencing; the USBP has testified about their preference for fencing that can be seen through, so as to identify the activity occurring on the Mexican side of the border and thus preserve their tactical advantage over potential border crossers, and to better avoid potential rockings<sup>64</sup> or other violent incidents. Sandia fencing has been effective in San Diego and can be seen through, but is among the more expensive fencing options. Bollard fencing has been effective in its limited deployment and can also be seen through, but is also expensive to install and maintain. Chain link fencing is relatively economical, but more easily compromised.<sup>65</sup> If fencing is to be constructed along the border, an issue concerns what kinds of fencing should be constructed in order to maximize its deterrent effect and its utility to the USBP while minimizing the costs associated with its construction and maintenance.

The USBP has testified that border fencing is most effective for its operational purposes when deployed along urban areas.<sup>66</sup> In these areas, individuals crossing the border have a short distance to cover before disappearing into neighborhoods; once they have entered neighborhoods it is much more difficult for USBP agents to identify and apprehend unauthorized aliens. Additionally, from populated areas it is relatively easy for unauthorized aliens to find transportation into the interior. For these reasons, all of the border fencing constructed by the USBP to date has been built in urban areas abutting the border, such as San Diego, Nogales, and El Paso. In rural areas, the USBP has testified that it has a tactical advantage over border crossers because they must travel longer distances before reaching populated areas. According to CBP, fencing is manpower

intensive because agents must continually check the fence for breaches and for illegal activity. This does not represent a problem in urban areas, because the USBP stations are typically located near the border in those areas. In some of the more rural areas of the border, where the nearest towns and USBP stations may be many miles away from the border, this would mean that agents would need to spend much of their work day commuting from the nearest USBP station to the fence location.<sup>67</sup> Additionally, because the border fencing constructed to date has been built along urban areas it has been relatively easy to house the individuals involved in its construction. If border fencing is extended into the more remote areas of the border, the costs of its construction may increase due to the need to bring the individuals and goods required to build the fence to these areas for extended periods of time. A very practical issue concerns what areas of the border should be fenced. Should fencing be restricted to urban or semi-urban areas in order to give the USBP a tactical advantage over border crossers, or should fencing be constructed along any geographical area of the border that features large numbers of unauthorized immigration? In rural areas, should fencing be limited to areas of high illegal entry in order to impede individuals from crossing the border, or should fencing be constructed as a deterrent in any area, even those featuring low levels of illegal entry? Should fencing be deployed in sectors where the distance between the nearest USBP station and the fence requires agents to spend most of their day commuting? Should fencing be deployed to the northern border as well as the southwest border? Will building fencing along more remote areas of the border increase the construction costs?

There are a number of issues associated with the acquisition of the land that would be required for border fencing. Much of the land along the California and Arizona

border is owned by the federal government, however most of the land along the Texas border is owned by private individuals. What will the costs of acquiring the land to construct border fencing be, and have these costs been factored into estimates of border fencing costs? Will eminent domain be used to confiscate land from individuals who do not wish to have fencing built on their lands?

A corollary issue may involve DHS' authority to construct border fencing along tribal lands. The Arizona desert along the Tohono O'odham reservation has become one of the most heavily trafficked border areas in the country, and the USBP has been restricted in its operations in the reservation due to tribal concerns.<sup>68</sup> The Tohono O'odham have reportedly vowed to fight the construction of fencing on tribe-owned land, citing environmental and cultural concerns.<sup>69</sup> Whether the expanded waiver authority that was given to the Secretary of DHS by the REAL-ID Act would allow the department to override the jurisdiction of tribal governments along the border remains an open question.

The governments of Mexico and Canada have both voiced concern about the United States constructing barriers along the international border. Mexican President Vicente Fox has come out strongly against the construction of border barriers on numerous occasions, stating his belief that these projects isolate the two nations, create frustration and misunderstandings, and do not solve the underlying problems that lead individuals to enter the United States illegally. Mexican Press Secretary Rubén Aguilar Valenzuela stated his government's belief, "history has also taught us that a wall is never the solution to problems and that all walls eventually get torn down."<sup>70</sup> The Mexican government has reportedly forwarded numerous diplomatic notes to the White House

registering its complaints against the possible expansion of border fencing. The Canadian government has also reportedly voiced concern over language that was inserted into H.R. 4437 that would require a study of fencing options along the northern border, citing the impracticality of fencing the northern border and the fact that the U.S. government has never discussed such a plan with Canadian authorities.<sup>71</sup> Deputy Assistant Secretary for Immigration and Customs Enforcement, John P. Clark reportedly stated during congressional testimony that the proposed expansion of border fencing “harkens back to the Chinese wall and the Berlin Wall, not the message we want to send to the Mexican government, the Canadian government, and the rest of the world.”<sup>72</sup> There are a number of possible issues for Congress to consider involving the potential diplomatic ramifications of constructing barriers along the border: (1) do the gains in border security outweigh the risk of alienating Mexico and Canada? (2) should the Mexican or Canadian government’s opinions or wishes be taken into account when border fencing is concerned; (3) given the need to coordinate intelligence and law enforcement activities at the border, should maintaining cordial working relationships with Mexico and Canada take precedence over sealing the border with physical barriers?

There is considerable evidence that the USBP’s historical strategy of “Prevention through Deterrence,” whereby agents and resources including border fencing and other barriers have been concentrated along urban areas and areas traditionally featuring high levels of illegal entry, has succeeded in changing the flow of illegal migration. While San Diego and El Paso were historically the two sectors that featured the most apprehensions and the highest levels of illegal immigration, since the mid-1990s and the advent of Operations Gatekeeper and Hold the Line in those sectors, the more remote geographical

areas of the Arizona border have become the hot-spots for illegal migration into the United States. One unintended consequence of this enforcement posture and the shift in migration patterns has been an increase in the number of migrant deaths each year; on average 200 migrants died each year in the early 1990s, compared with 472 migrant deaths in 2005. Another unintended consequence of this enforcement posture may have been a relative increase, compared to the national average, in crime along the border in these more remote regions. While crime rates in San Diego and El Paso have declined over the past fifteen years, the reduction in crime rates along the more rural areas of the border have lagged behind the national trends. Another unintended consequence of the border fencing has been the proliferation of tunnels dug underneath the border. In San Diego, where the double-layer Sandia fencing has been constructed, smugglers have dug a number of tunnels underneath the border fence. One of these tunnels was almost a kilometer long and was built from reinforced concrete—evidence of a rather sophisticated smuggling operation. A possible issue for Congress to consider as it debates expanding the existing border fencing concerns what the unintended consequences of this expansion could be. Given the re-routing of migration flows that have already occurred, are DHS and the relevant border communities prepared to handle the increased flow of illegal migration to non-reinforced areas? Is DHS prepared to deal with an increase in the phenomenon of cross-border tunnels and other attempts to defeat the purpose of the fencing? What will the impact on crime rates be along the unreinforced areas of the

border? Will USBP agents be required to spend some of their patrolling time guarding the fence?<sup>26</sup>

### Conclusion

The information gathered through the literature review about border barriers is of great importance to this inquiry. It constitutes the core of the inspiration in the process of addressing the problem. Border barriers are not new, so this literature review shows some different types that have been built in time and space. They range from walls, fences, and minefields to interdiction air bombing. People built them for defense or either purpose, but have they been necessary? Yes, as courses of action or options to address threats such as foreign invasions, border disputes, and cross-border irregular movements of troops and civilian populations.

In these regards, building a barrier on the international border between the DRC, Rwanda, and Uganda can also be a way to improve security in that area. The question remains about the effectiveness of these barriers. There are different answers, opinions, as well as different interpretations depending on the side of the builder or the threat against which it was built. Obviously, no human solution is perfect, but the matter is whether or not the solution mitigates the initial risks.

Again, what matters is the balance between the advantages and the disadvantages. On the one hand, the list of advantages is not exhaustive and range from a short period of time to build, prevention against terrorism, deterrence of foreign interference or

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<sup>26</sup> Neto, Blas Nunez, and Stephen Vina, *Border Security: Barriers Along the U.S. International Border* (Washington, DC: Congressional Research Service, 2006), accessed January 24, 2016, <http://trac.syr.edu/immigration/library/P1065.pdf>.

incursions, and contraband of weapons and goods. To these, are added the control of the movement of people across the border, use as diplomatic weapon and for touristic, cultural and economic goals, and non-lethality for civilians. On the other hand, the disadvantages are a longer period to build, higher cost and lethality for civilians, diplomatic issues, and isolation of the country.

These will apply as factors in chapter 4 for the analysis and determination of the feasibility, acceptability, and suitability of a barrier at the international boundary between the DRC, Rwanda, and Uganda. The U.S./Mexico fence is recent, so the information provided will be incorporated into the analysis in chapter 4.

## CHAPTER 3

### RESEARCH METHODOLOGY

#### Introduction

The purpose of this research is to provide an additional approach to the military activities the FARDC conduct in Ituri and Nord-Kivu. The research hypothesis is in order to improve the security, they need to build a barrier to deter hostile activities to and from neighboring Uganda and Rwanda. This will also deter any support of rebellions and local militias from these countries, leading to their defeat and ensuring the stability of the eastern part of the DRC. Stability and peace will put people to work. Work will allow them to satisfy their vital needs. On the other side, it will end or mitigate arms and economic goods smuggling along the border with the two countries. It will also solve the question of blood minerals, and improve the economy of the DRC.

This chapter comprises two sections. The first section deals with steps one to thirteen which have been taken in order to obtain information to address the primary and secondary questions. It also deals with the criteria which have been developed to determine feasibility, suitability or relevance of examples, and credibility of sources. The second section is the summary and conclusion, leading into chapter 4.

#### Steps Taken to Obtain Information and to Address Problem

To address the primary and secondary questions, the researcher has used Long's case study research design. This methodology has consisted in the following steps that the researcher used in chapter 4:

1. Decide on purpose: to inform.

2. Describe the intended audience/CDM (chief decision maker) that the case study will inform.
3. What are the CDM's key concerns?
4. Describe the range of policy decisions the case study will inform.
5. Summarize the broader context for the analysis to establish the settings.
6. Describe the conceptual models that will be used to evaluate the case study content to the stakeholders.
7. Identify decision process models that the stakeholders will use to make sense of the case study recommendations). This implies the use of Field Manual 6-0 (Commander and Staff Organizations and Operations), chapter 5, and the following tasks: (1) to develop criteria, by using the advantages and disadvantages as criteria; (2) to generate possible solutions by collection of data concerning each option or course of action (COAs). Group these COAs in three COA groups. These COAs include walls, as COA group one; fences are COA group two; minefields are COA group three; and Ho Chi Minh Trail is COA group four.; to define the characteristics for feasibility, suitability, and acceptability to be applied to these COAs; (3) analysis of COAs by applying the evaluating criteria of feasibility, suitability, and acceptability to these COAs; (4) choice of the best COA in terms of feasibility, acceptability, and suitability to suggest to the CDM.
8. To identify the stakeholders' environment in terms of level of interest and capacity to shape the environment.

9. To describe the analytical approach that will persuade the CDM and stakeholders and which will be appropriate to the information gathered.
10. To describe the range and sample of sources that will be sufficient and convincing to the CDM and stakeholders (due diligence).
11. To describe the necessary and sufficient assumptions, limitations, and delimitations that must be made in order to proceed; revise and adjust as needed.
12. To describe the evaluating criteria the stakeholders and CDM will use to assess your recommendations if your purpose is to persuade.
13. How might sociology and politicization influence the message/content of the researcher's argument; how will the researcher account for it or address it?<sup>27</sup>

Considering the case study as the research method, there are many criteria developed to determine feasibility of method, suitability or relevance of examples, and credibility of sources. The first criteria is the complexity of the human and security issues related to the eastern part of the DRC as presented in chapters 1 and 2. The second criteria is the goal of this subject, which is to inform the decision maker about the COA to take to improve the situation. The third criteria is the wide applicability beyond the boundaries of the chosen setting so that any other country facing the same scenario can

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<sup>27</sup> Kenneth Long, Research Methods Seminar: Case Studies in MMAS Program (Instructor lecture, US Army Command and General Staff College, Ft Leavenworth, KS, 2015); Kenneth Long, "Case Studies in Action: A Practical Method for Gaining Useful Insight in Military Masters of Arts and Sciences Program" (Proceedings of the Forty Third Annual Conference of the Association for Business Simulation and Experimental Learning ABSEL), in *Developments in Business Simulation and Experiential Learning*, ed. William Wellington (Pensacola, FL: 2016).

be inspired to solve its border security problem. Finally, on the one hand, the relevance of examples and credibility of sources have been determined by the evidence and choice of the existing barriers as presented in chapters 1 and 2. On the other hand, the information has been collected from official sources including the HALO Trust and Congress, and while using Wikipedia.

### Summary and Conclusion

In conclusion, the third chapter provides the methodology used in this thesis. The researcher chose the case studies methodology, namely Dr. Kenneth Long's case study design to conduct this research. This research model consists of thirteen key elements intended to satisfy the purpose of informing or persuading policy decision makers. In addition, it also helps the researcher in the analysis that provides the key elements to answer the primary and secondary questions.

These thirteen key elements are divided into the first two sections which precede the conclusion of this chapter. The first section deals with steps one to seven. The second section deals with steps eight to thirteen. Finally, the conclusion leads to the analysis in chapter 4.

## CHAPTER 4

### ANALYSIS

#### Introduction

##### Purpose

The purpose of this research is to provide an additional approach to the military activities the FARDC conduct in Ituri and Nord-Kivu. The research hypothesis is that in order to improve security, they need to build a barrier to deter hostile activities to and from neighboring Uganda and Rwanda. This will also deter any support of rebellions and local militias from these countries, leading to their defeat and ensuring the stability of the eastern part of the DRC. Stability and peace will put people to work. Work will allow them to satisfy their vital needs. On the other side, it will end or mitigate arms and economic goods smuggling along the border with the two countries. It will also address the question of blood minerals, and improve the economy of the DRC.

##### Organization of Chapter

Chapter 4, which comprises three sections, constitutes the analysis of the researcher. Subsection One is the introduction. It provides the purpose of the research and the organization of the chapter. Subsection Two provides information and answers to the questions using Long's case study research design, as described in chapter 3. Subsection Two goes from step one to step thirteen and provides:

1. The purpose of this research (informative or persuasive); this helps delineate the range that the analysis will cover.

2. The description of the intended audience and CDM (chief decision maker) that this case study will inform.
3. The key concerns of the CDM.
4. The range of policy decisions the case study will inform.
5. The summary of broader context for the analysis to establish the setting boundaries.

The research methodology is covered in steps six and seven. It includes:

6. The description of the conceptual models of the stakeholders that will be used to evaluate the case study (for case study that inform);
7. The identification of the decision process that will be used to make sense of the case study recommendations (for case studies that persuade); this includes: (1) the advantages and disadvantage of the different groups of barriers that will be used as screening criteria of the different options or COAs; (2) the definitions the characteristics of feasibility, suitability, and acceptability; (3) the analysis by applying the screening criteria to the evaluation criteria of feasibility, suitability, and acceptability of these COAs; (4) the best COA to recommend to the CDM.

The final steps from eight to thirteen focus much on stakeholders and therefore it includes:

8. The identification of the stakeholders in terms of level of interest and capacity to shape the environment.
9. The description of the analytical approach that will be persuasive to the CDM and stakeholders and which will be appropriate to the information gathered.

10. The description of the range and sample of sources that will be sufficient and convincing to the CDM and stakeholders (due diligence).
11. The description of the necessary and sufficient assumptions, limitations, and delimitations that must be made in order to proceed; revise and adjust as needed.
12. The description of the evaluation criteria the stakeholders and CDM will use to assess the recommendations of the researcher if his purpose is to persuade.
13. The way sociology and politicization might influence the message/content of the argument of the researcher and the way it was addressed and accounted for.

Subsection Three provides the Summary and Conclusions to chapter 4.

### Findings and Answers to the Questions

#### Step One: Purpose

The purpose of the study is mainly to inform the Congolese authorities, namely the minister of defense that as long as the international border with Rwanda and Uganda is porous, they will interfere in the DRC internal affairs. A step to stabilize the provinces of Ituri and Nord-Kivu is first to prepare a barrier to deter interference. Such a project could produce effects on these two countries, which may compel them to seek a diplomatic and durable solution to this issue. This solution might consist of the will to stop creating and supporting rebel groups, the isolation of the existing rebel groups and interstate actor groups from these two countries. This will require security cooperation through a regional organization which will reinforce security measures along the borders.

If soft power fails, the decision maker will build the barrier as the last resort to improve border security. Many countries did so in the past and continue to do so. This project will lead to further studies and will comprise the updated and precise cost. It will also assist in gathering and sharpening the social, political, and economic information, and the legal arsenal which will convince the parliament and the supreme court to support the project.

#### Step Two: Intended Audience and Chief Decision Maker

The intended audience consists of those interested in this topic; in particular, the three branches of the DRC, the executive, the legislative, and judicial. They are also stakeholders as their key members play a concurrent role that helps the Congolese state to function.

The executive key players, in relation to this thesis are the president of the DRC, the prime minister, the minister of defense and CDM, and the governors of the Ituri and Nord-Kivu provinces. According to the DRC constitution, the president is the head of the state, the warrant of territorial integrity, and international treaties and agreements, the supreme commander and the symbol of national sovereignty. The prime minister is chief of the government, responsible for the conduct of the national policy and government actions. The minister of defense is the decision maker concerning defense issues. The governors of the provinces of Ituri and Nord-Kivu are also involved in this issue as heads of their provinces.

The legislative key players in relation to this thesis are the national assembly and the senate, as the two chambers of the parliament or congress. They are involved in this research because they vote the national budget after discussion about the feasibility,

suitability, and acceptability of the proposed barrier and other planned national expenses. They also control the actions of the government.

Finally, the judicial branch, namely the supreme court is involved in this research. They are involved in their role of enforcing the laws by delivering land acquisition and expropriation authorizations, as well as right of compensations.

### Step Three: CDM Key Concerns

The key concern of the CDM is the security in the eastern part of the DRC. This, in other words, is the end of foreign interference, isolation, and defeat of rebel groups, illegal armed groups (IAG), and restoration of law and order in the provinces of Ituri and Nord-Kivu.

### Step Four: Range of Policy Decisions

The range of policy decisions this case study will cover are defense, diplomatic, judicial, and financial. Defense policy requires the decision of the defense minister who is in charge of implementing it. It is defined by the government and approved by the vote of the parliament. Diplomatic policy involves the ministry of foreign affairs to advocate for the legitimate right of the DRC to defend the integrity of its territory. The concept of the barrier can involve diplomatic pressure or the opportunity to negotiate with Rwanda and Uganda for a durable peace in the region, as of the time of the defunct Community of the Great Lakes Countries. Judicial involves the supreme court for any legal issue concerning the construction of the barrier, mainly land acquisition and compensations. Last is financial, which involves the decision of ministry of finances in order to allocate

financial resources to the construction of the barrier after vote of the budget by parliament.

#### Step Five: Summary of Broader Context

The research deals with a complex situation or context consisting of social, military, diplomatic, financial (economic), and judicial issues. The analysis will cover all these aspects to address the problem. Setting the boundaries in terms of their specificity is very important in order to solve the conflict between them while conducting the analysis. It will avoid the mistake of providing a simple solution to a complex problem. In this regard, a barrier will assumedly address this complex problem because it provides a solution which balances the social, military, diplomatic, financial, and judicial aspects as it will be shown in the screening criteria discussion in step seven.

#### Step Six: Description of the Conceptual Model of the Stakeholders

The defense minister, as well as the parliament, and the other stakeholders are involved at the strategic level, so the first conceptual model will be Yarger's model of feasibility, acceptability, and suitability.<sup>28</sup> These characteristics will be established in accordance with the advantages and disadvantages. They will be used as screening criteria of the different groups of barriers: walls, fences, minefields, and others. Referring to the Military Decision Making Process, the groups of barriers are considered as options or Courses of Action (COAs). The balance of advantages and disadvantages based on

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<sup>28</sup> Richard H. Yarger, "Towards a Theory of Strategy: Art Lykke and the Army War College Strategy Model," accessed March 5, 2016, <http://dde.carlisle.army.mil/authors/stratpap.htm>, [www.au.af.mil/au/awc/.../stratpap.htm](http://www.au.af.mil/au/awc/.../stratpap.htm).

facts and assumptions will help establish the evaluating criteria of feasibility, acceptability, and suitability.

### Step Seven: Analysis of the Researcher and Decision Process

#### Advantages and Disadvantages

The advantages are based on facts and assumptions about the different barriers in the literature review:

1. Relative cost and time to build.
2. Less lethality and collateral damages on civilians.
3. Use as diplomatic weapon.
4. Reusable and save resources and time to undo.
5. Extremely lethal to the enemy.

The disadvantages are based on facts and assumptions about the different barriers in the literature review:

1. Destroyable and loss of resources.
2. Requires use of sensors and garrisoning.
3. Requires much more time and resources to undo.
4. Unacceptable regarding international standards.
5. Requires important air capabilities.

#### Possible Solutions, Options, or COAs:

1. COA1: Walls (Great Wall of China and the Berlin Wall).
2. COA2: Fences (Israel-Palestine fence, the U.S./Mexico fence, and the Korean DMZ).

3. COA3: Minefields (Mozambique and Cambodia mine warfare deniability).
4. COA4: Other (Ho Chi Min Trail sensors).

COAs	Table 1. Advantages (Screening Criteria)					
	Relative cost and time to build;	Less lethality and collateral damages on civilians	Use as diplomatic weapon;	Reusable and save resources and time to undo	Extremely lethal to the enemy;	Count of advantages
COA1 Walls	Yes	Yes	Yes	No	No	3
COA2 Fences	Yes	Yes	Yes	Yes	No	4
COA3 Mines	Yes	No	No	No	Yes	2
COA4 Sensors	No	Yes	No	?	Yes	2

*Source:* Developed by the author.

COAs	Table 2. Disadvantages (Screening Criteria)					
	Destroyable and loss of resources	Requires use of sensors and garrisoning	Requires much more time and resources to undo	Unacceptable regarding international standards	Requires important air capabilities	Count disadvantages
COA1 Walls	Yes	Yes	Yes	Yes	Yes	5
COA2 Fences	Yes	Yes	No	No	?	2
COA3 Mines	Yes	No	Yes	Yes	No	3
COA4 Sensors	No	Yes	No	No	Yes	2

*Source:* Developed by the author.

Table 3. Result of Screening Criteria

COA	Count advantages	Count disadvantages	Results
COA1 Walls	3	5	$3 - 5 = -2$
COA2 Fences	4	2	$4 - 2 = 2$
COA3 Mines	2	3	$2 - 3 = -1$
COA4 Sensors	2	2	$2 - 2 = 0$

*Source:* Developed by the author.

Note: Screening criteria—if any COA’s advantages minus its disadvantages is neutral (0) or positive (+), the COA is valid.

Analysis of the result: The mathematical difference between COA 1 and COA 3 is negative (COA1 is -2 and COA3 is -1). Therefore, they do not meet the screening criteria, and are invalid. The mathematical difference between COA 2 and COA 4 is neutral of positive (COA2 is +2 and COA4 is 0). They meet the screening criteria, and are therefore valid and will be included in the final COA analysis.

#### Definitions of Feasibility, Suitability, and Acceptability

Feasibility means that there must be adequate resources to implement the strategy. In other words, can the action be accomplished by the means available (relates to concept)?

Acceptability means that the stakeholders of the strategy have to agree to the proposal. In other words, are the consequences of cost justified by the importance of the effect desired (relates to resources/concept)?

Suitability means that the strategy had to have a reasonable chance of attaining the desired political objectives. In other words, will its attainment accomplish the effect desired (relates to objective)?<sup>29</sup>

Table 4. Evaluating Criteria			
COAs	Feasibility	Acceptability	Suitability
COA2	Yes	Yes	Yes
COA4	Yes	Yes	Yes

*Source:* Developed by the author.

COA2 and COA4 are feasible, suitable, and acceptable. Feasible, because the DRC is assumed to be one of the richest countries in mineral resources. As a matter of priority, it can sign a contract for the fence with sensors and garrisoning infrastructure, and pay the cost by means of its GDP or mineral resources. Sensors will include radars, surveillance cameras, and alert systems. Garrisoning will include activities and facilities to shelter the troops that will man the fence, patrols, offices, check points, etc. It is suitable because it can achieve the objective, i.e. prevent or deter foreign interference, and illegal cross border movements. Sensors, alarm systems, and patrols will improve the

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<sup>29</sup> Yarger.

efficiency. They are acceptable because they offer the most advantages and the least disadvantages of all the rest of barriers as shown in tables 1 and 2, above. This is a powerful argument to convince the stakeholders.

COA1 could be feasible, suitable, but not acceptable. For feasible and suitable, the reasons are the same as COA2 and 4. Nevertheless, it is not acceptable because it is subject to destruction if the relationship improves as happened with the Berlin Wall. This constitutes a loss of resources, contrarily to COA2 and 4 which can be dismantled and reused if the relation with the two neighboring countries improves. As an example, former U.S. President, Ronald Regan asked Mr. Mikhail Gorbachev in the Brandenburg speech to tear down the Berlin Wall; it happened, the Cold War ended, and a new order in the world began.

COA3 could be feasible regarding the affordability by means of the mineral resources as for COA1 and 2. It is suitable because it can reach the objective of deterrence. It is even more lethal to the enemy than COA1 and 2, but it is not acceptable due to collateral damages on civilians, mainly IDPs and refugees. Again, a minefield is less expensive to make, but it is very expensive to demine in addition to the risk the deminers face to achieve the task.

The recommended COAs to the CDM are COA 2 and 4: fences and sensors in reference to the data described in tables 2, 3, and 4. The following facts and assumptions are related to the cost of the fence.

1. The length of the international border of the DRC and Rwanda and Uganda is 1,113 kilometers.
2. The length of Lake Albert (Mobutu) is 160 kilometers (99 miles).

3. The length of Lake Eduard (Idi Amin) is 77 kilometers (48 miles).
4. The total water boundary not needing the fence, and requiring only Navy patrols, is 160 kilometers plus 77 kilometers, which totals 237 kilometers.
5. The total length of the fence is the length of the international border minus the total water boundary; therefore, the total length of fence is 1,113 kilometers minus 237 kilometers, which totals 876 kilometers.
6. Considering the cost of the U.S./Mexico fence, the Corps of Engineers predicted that construction costs for the landing mat fencing would range from \$388,005 to \$431,117 per mile;<sup>30</sup> therefore, the 1,113 kilometer border would total US\$274,912,230. Note: This is arrived at using a median cost of USD \$409,561 per mile.
7. The total length of the fence minus the water boundary total US\$274,912,230 multiplied by 876 kilometers, which totals US\$216,462,815.

Given that the GDP of the DRC is US\$9 billion as of 2015, and its important potentiality in mineral resources, the feasibility of the fence is confirmed by the figures. The US\$216,462,815 cost might be spread over a decade. This means in ten years, the DRC can allocate US\$21,646,281.5 or more if it increases its GDP.

Table 5. Estimation of Cost

Fiscal Year	Cost per year in US\$	Number of years	Total cost in US\$
Fiscal Year 1-10	21,646,281.5	10	216,462,815

*Source:* Developed by the author.

<sup>30</sup> U.S. Department of Justice, 1-13.

### Step Eight: Interests of the Stakeholders

The interest of all the stake holders is the security of the eastern part of the DRC, but the capacities differ. The capacity of the minister of defense lies in the decision to build or not to build the barrier. The capacity of the parliament is their vote of the budget which authorizes the allocation of resources for the construction of the barrier. The capacity of the minister of finance (economy) lies in the materialization or the execution of the authorization of the budget voted by the parliament. The capacity of the supreme court is the legalization of land appropriation for public interest and compensations of the disowned individuals. Last, the capacity of the provincial authorities lies on their position power, as top political authorities of their respective provinces. They play an important role in influencing the decision of the minister of defense through the interior minister.

### Step Nine: Persuasive Analytical Approach

The analytical approach that will be persuasive to the CDM and stakeholders consists of three major arguments. First, the information gathered on the conflict in the DRC mentions that in the last ten years of the border conflict, there have been five million dead, 2.2 million IDPs, forty thousand rape victims, hundreds of thousands of refugees, and the extreme hemorrhage of mineral resources plunder (US\$20 million per month), the destruction of wild life (Okapi, species found only in the DRC), the pauperization of the eastern part of the country, and destabilizing effects all over the country, etc.

These facts establish the urgency of the situation, so the project of the fence seems to be a strong weapon for soft power and hard power in order to compel the two

hostile countries to negotiate a durable solution. Nevertheless, its implementation should be the last resort for the country to improve security if soft power fails.

Second, it is important to acknowledge the right to every country to protect its integrity as inalienable. The project of building a barrier may work as diplomatic pressure to lead authorities from Rwanda and Uganda to consider a diplomatic solution to this crisis. The construction of the barrier should be the last resort if other means fail. Last, throughout history many countries have built walls, fences, and other types of barriers as mentioned in the literature review. Currently, the United States is still considering the option of building a fence to deter illegal immigration, smuggling, and terrorism at the Mexican border.

#### Step Ten: Sources of Information

As presented in the literature review, the researcher has used secondary sources. The relevance of these sources relies on the fact that they had been produced by third parties from information provided by participants, or results of analysis or discovery of material. In addition to this, the researcher chose at least two samples for each type of barrier and provided their references in the literature review.

#### Step Eleven: Assumptions, Limitations, and Delimitations

These assumptions pertain to the analysis of the COA options

1. Use of the fence as a weapon of soft power.
2. Implementation of the project as hard power or the last resort to secure the northeastern part of the country.
3. The DRC is able to achieve the project.

4. Soft power can fail, and barriers like the Berlin Wall can fail.
5. Relations may improve and the fence can be dismantled.
6. Soft power will take into account the reestablishment of a regional organization like the former Community of Countries of the Great Lakes, including Rwanda, Uganda, and Burundi in order to supervise the implementation of security decisions.

These limitations pertaining to the analysis of COA options

1. The fence, as well as any human work, is not a perfect solution; there is a need for garrisoning and sensors to improve its efficiency;
2. The reaction of the CDM and stakeholders may or may not be positive.
3. Rwanda and Uganda may or may not react according to the expectations.

These delimitations pertain to the scope of the argument

1. Not all of the eastern part of the DRC is effected by the fence.
2. The international border with Rwanda and Uganda is effected because only these two countries are openly involved in the destabilization of the provinces of Ituri and Nord-Kivu.

Step Twelve: Valuation Criteria

The researcher assumes that the stakeholders and DCM will use the evaluation criteria of feasibility, suitability, and acceptability. The reason for using these evaluation criteria is that the DCM position is located at the strategic level of national decision. The strategy model proposed by Yarger fits this case study.

### Step Thirteen: Influence of Sociology and Politicization on the Message

The conflict in the DRC has made five million dead, two million IDPs, forty thousand rapes, minerals plunder estimated to twenty million dollars per month, and the economic fragility of the population of the eastern part of the DRC.<sup>31</sup> In this regard, the researcher assumes that both the politicians and the population are tired of this protracted war. Given the urgency, this message might be welcome as a good initiative to improve the social conditions of the population and give politicians an opportunity.

### Conclusions and Summary

In conclusion, chapter 4 provides the analysis of the researcher. It is divided into three sections and the conclusion or summary. Section one deals with steps one to five. It provides information about the purpose of this research which is mainly to inform, but also to persuade to some extent. It also describes the intended audience and CDM that this case study will inform as well as the key concerns of the CDM, and the range of policy decisions that the case study will inform. The final section is the summary of the broader context for the analysis to establish setting the boundaries.

Section two provides information from steps six to seven. It describes the conceptual models of the stakeholders that will be used to evaluate the case study which is also that of the researcher. It also identifies the decision process that will be used to make sense of the case study recommendations, including:

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<sup>31</sup> Anup Shah, "The Democratic Republic of Congo," Global Issues, accessed March 5, 2016, <http://www.globalissues.org/article/87/the-democratic-republic-of-congo>.

1. The advantages and disadvantage of the different groups of barriers that will be used as screening criteria of the different options or COAs;
2. The definitions the characteristics of feasibility, suitability, and acceptability.
3. The analysis by applying the screening criteria to the evaluation criteria of feasibility, suitability, and acceptability of these COAs;
4. The best COA to recommend to the CDM.

Section three deals with steps eight to thirteen. It identifies the stakeholders in terms of level of interest and capacity to shape the environment and the description of the analytical approach that will be persuasive to the CDM and stakeholders and which will be appropriate to the information gathered. It also describes the range and sample of sources that will be sufficient and convincing to the CDM and stakeholders, and the necessary and sufficient assumptions, limitations and delimitations that must be made in order to proceed, revise, and adjust as needed. Finally, it describes the evaluation criteria the stakeholders and CDM will use to assess the recommendations of the researcher, and the way sociology and politicization might influence the message/content of the argument of the researcher, and the way it will be accounted for or addressed.

In brief, chapter 4 provides information to answer the primary and secondary questions, and formulate recommendations. Its conclusion leads to chapter 5 which will present conclusions and recommendation.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### Introduction

##### Purpose

The purpose of this research is to provide an additional approach to the military activities the FARDC conduct in Ituri and Nord-Kivu. This means that in order to improve the security, they need to build a barrier to deter hostile activities to and from neighboring Uganda and Rwanda. This will also deter any support of rebellions and local militias from these countries, leading to their defeat and ensuring the stability of the eastern part of the DRC. Stability and peace will put people to work. Work will allow them to satisfy their vital needs. On the other side, it will end or mitigate arms and economic goods smuggling along the border with the two countries. It will also solve the question of blood minerals, and improve the economy of the DRC.

Chapter 5 is organized into four sections. Section one is the introduction. Section two deals with the interpretation of findings described in chapter 4. Section three provides the recommendations. Section four provides the summary and conclusions.

#### Summary of Findings from Chapter 4

Four types of barriers have been submitted for research analysis. They constitute four different COAs to improve security conditions in the provinces of Ituri and Nord-Kivu. COA1 is Walls, COA2 is Fences, COA3 is Minefields, and COA4 is Sensors. After screening and evaluation of these COAs, COA2 and 4, have met the conditions of

feasibility, suitability, and acceptability. The combination of COA2 and 4 more accurately addresses the problem of security in these two provinces.

### Interpretation of the Findings

#### Meaning of the Findings

Since 1997, the DRC has faced security issues. These issues include hostile interference of neighboring Rwanda and Uganda, five million dead, 2.2 million IDPs, forty thousand rape victims, hundreds of thousands of refugees, and the extreme hemorrhage of mineral resources plunder (US\$20 million per month), the destruction of wild life (Okapi, species found only in the DRC), the pauperization of the eastern part of the country, and destabilizing effects over all the country, etc.

This research confirms the hypothesis that in order to improve the security, they need to build a barrier to deter hostile activities to and from neighboring Uganda and Rwanda. Consequently, it will also deter any support of rebellions and local militias from these countries, leading to their defeat and ensuring the stability of the eastern part of the DRC, solve the question of blood minerals, and improve the economy of the DRC. The result of screening and evaluation certifies that a fence reinforced with sensors (COA2 and COA4) is the best recommendation to the CDM and stakeholders. Therefore, it is feasible, suitable, and acceptable.

First, this fence is feasible. This means that the economic capacity of the DRC can afford this type of fence. As shown in table 5, even with its nine billion GDP (2015), the DRC can build it in ten years or less considering that there is a GDP increase every year.

Second, this fence is suitable. This means that it will achieve the end state of improving security. In other words, the fence will stall or delay the enemy from crossing

the border whereas the sensors installed along it will detect and sound the alarm about his presence while garrisons scramble fighting patrols to address the threat. Perfect solutions do not exist; what matters is the effectiveness of the fence to mitigate illegal movements across the border.

Third, this fence is acceptable. This means that with a relative cost of US\$21,646,281.5 per FY for ten years, the CDM and stakeholders will agree to support the decision considering the urgency. It means also that this project is lawful and ethical compared to the mines, payment of compensations to the expropriated people, and companies for their lands.

#### Social, Economic, Ecological, and Political Implications

1. Social: return of displaced persons(refugees and IDPs) back home.
2. Economic: mitigation of border smuggling; conflict minerals will no longer fuel the war, but improve local and national economies; people will work to satisfy their needs.
3. Ecological: fauna preserved, especially the Okapi and mountain gorilla species as well as the flora.
4. Political: people and political leaders will trust each other.

#### The Unexpected Findings

1. Perfect solutions do not exist; how to manage or balance the risks matters in the decision making.
2. Peace or victory is not only the result of offensive operations, but the combination of offense, defense, and diplomatic efforts.

3. Building barriers is good; building bridges is better.

### Recommendations

#### Further Study

Because of time constraints, the purpose of this research has been to inform the DCM about building a barrier in order to improve security in Ituri and Nord-Kivu. Therefore, the researcher recommends further research to persuade him, as persuasion requires elaboration on the topic. Further research will raise the questions of the updated cost, the type of fence, its height, what type of sensors, and the decision process that will be used to make sense of the case study recommendations.

#### Action

The researcher recommends the use of soft power or diplomatic power first to address the problem, but if it fails, building the fence will serve as hard power to bring hostile Rwanda and Uganda to negotiate durable peace in the region.

### Summary and Conclusions

First, the purpose of this research is to inform, not to persuade the CDM that a fence with sensors along the international border of Ituri and Nord-Kivu is necessary to improve their security conditions. Nevertheless, it constitutes the last resort if diplomacy fails.

Second, this research confirms the feasibility, suitability, and acceptability of the fence. The DRC has the resources to afford it and the stakeholders will support the proposal. In case of diplomatic failure with Rwanda and Uganda, the fence will deter

foreign interference and have positive ramifications on the social, economic, and political fields.

Thirdly, the research has been undertaken under several challenges. These challenges include time constraints due to academic rigors, the complexity of the problem, unfamiliarity with the English language, inexperience in informatics, and the ambiguity of a new academic and research environment.

Finally, no human work is perfect. Therefore, the researcher has attempted to produce a better work beyond his limitations and the ambiguity of the problem.

Therefore, any imperfection in this work is solely his own.

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