



# NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

## THESIS

**WHY FAILING TERRORIST GROUPS PERSIST  
REVISITED: A SOCIAL NETWORK APPROACH TO  
AQIM NETWORK RESILIENCE**

by

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December 2017

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NETWORK APPROACH TO AQIM NETWORK RESILIENCE**

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## **ABSTRACT**

To date, most analyses of the Al Qaeda in the Islamic Maghreb (AQIM) network have focused on qualitative analysis to determine trends and patterns in the group's evolution over time. Seldom has a combination of quantitative tools been used to derive inferences about the nature of the organization and its changing strategy. In this paper, the author draws on a combination of geospatial analysis and social network analysis in order to explore how the network has changed over time in response to efforts from local and international security forces to disrupt it. The analysis enables the community of interest to draw conclusions with regard to the resiliency of the network and its long-term goals in the Sahel region. Evidence indicates that AQIM is evolving into a less dense but more ethnically diverse organization that is rapidly restoring the operational capacity it lost during the 2013 French intervention in Mali. Despite major Western military efforts to suppress it, AQIM is increasingly able to conduct spectacular attacks across west Africa, further destabilizing an already precarious security environment. The thesis concludes with recommendations for crafting a strategy tailored to degrading and containing the threat from AQIM and its affiliates.

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## LIST OF ACRONYMS AND ABBREVIATIONS

ACLED	Armed Conflict Location and Event Data Project
AFRICOM	United States Africa Command
AAD	Ansar Dine
AQ	Al-Qaeda
AQIM	Al-Qaeda in the Islamic Maghreb
GIA	Armed Islamic Group
GIS	Geographic Information System
GSPC	Group for Salafist Preaching and Combat
HCUA	High council for the Unity of Azawad
IS	Islamic State
JNIM	Group to Support Islam and Muslims
MIA	Islamic Movement of Azawad
MINUSMA	United Nations Multidimensional Integrated Stabilization Mission in Mali
MLF	Macina Liberation Front
MUJAO	Movement for Oneness and Jihad in West Africa
QAP	Quadratic Assignment Procedure
SNA	Social Network Analysis
SOCAFRICA	United States Special Operations Command Africa
TSCTP	Trans-Sahara Counterterrorism Partnership
UNOCI	United Nations Operation in Cote D'Ivoire
VEO	Violent Extremist Organizations

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# I. INTRODUCTION

## A. OVERVIEW

Perhaps because of the attention lavished on the Islamic State's (IS) operations in Syria and Iraq, Al Qaeda continues to pose a threat to weak and unstable governments around the globe, particularly in West Africa. As of September 2017, Al Qaeda and its affiliates in Africa have conducted over 100 attacks in 2017, with most occurring in Mali.<sup>1</sup> Additionally, following the March 2017 formation of the Supporters of Islam and Muslim Groups (JNIM) between the four main Islamist Groups in Mali—Ansar Dine (AAD), Al-Murabitun, the Macina Liberation Front (MLF), and the Sahelian elements of Al-Qaeda in the Islamic Maghreb (AQIM)—terrorist groups in the Sahel have conducted over 25 attacks against government and security targets in Mali alone.<sup>2</sup> The resurgence of Islamist violence in the Sahel parallels the recovery and expansion of the Al-Qaeda in the Islamic Maghreb network.

## B. BACKGROUND

Following its failure to seize control of Mali in 2012, Al Qaeda in the Islamic Maghreb (AQIM) lost many fighters and much of its combat capability to the French forces that intervened to stop the Islamist advance on Bamako, Mali's capital. However, in the five years since the French intervention AQIM has managed to largely regain their numbers and capacity while expanding

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<sup>1</sup> Caleb Weiss, "Over 100 Al Qaeda-Linked Attacks in West Africa So Far in 2017." *FDD's Long War Journal* (May 26, 2017): 1–2. Accessed November 06, 2017. <http://www.longwarjournal.org/archives/2017/05/over-100-al-qaeda-linked-attacks-in-west-africa-so-far-in-2017.php>.

<sup>2</sup> Clionadh Raleigh, Andrew Linke, Håvard Hegre, and Joakim Karlsen. "Introducing ACLED—Armed Conflict Location and Event Data," *Journal of Peace Research*, 4, no. 5 (September 2010): 651–660.

operations in Mali, Burkina Faso, Niger, Mauritania, and Cote D'Ivoire as depicted in Figure 1. Since the inception of its predecessor, the Group for Salafist Preaching and Combat (GSPC), which was previously known as the Armed Islamic Group (GIA), AQIM has principally consisted of ethnic Arabs of Algerian nationality. AQIM's exile to the Sahel after sustained losses to Algerian security forces in the early 2000s precipitated an organizational evolution that incorporates a greater share of Sub-Saharan ethnicities in both its front-line forces and its leadership positions. AQIM is a resilient and adaptable terrorist group that has repeatedly demonstrated an extraordinary capacity to reconstitute its operational capabilities in the face of state repression and is now making efforts to better exploit and mobilize Salafist elements in new and ethnically diverse regions of Africa.



Figure 1. Areas of AQIM and Affiliate Operations.<sup>3</sup>

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<sup>3</sup> ESRI African Countries Shapefile, accessed 21 November 2017, <https://www.arcgis.com/home/item.html?id=16da193d9bcd4ae0b74febe39730658a>.

### **C. RESEARCH QUESTION**

This research project explores how AQIM, originally a movement designed to overthrow the Algerian government, is expanding its network into non-Arab regions in the Sahel. Specifically, it aims to examine the methods by which AQIM successfully embeds within target populations to overcome setbacks brought on by consistent counter-terrorism efforts from the international community. This topic highlights two critical research questions: Is the AQIM network, in fact, a resilient organization in the face of state pressure? Second, what is the impact of AQIM's recruitment of new ethnic groups in its evolution? The answers to these questions will provide insights into crafting better U.S. and partner nation responses to terrorist networks in West Africa.

### **D. STRUCTURE OF THE THESIS**

The next chapter (Chapter II) discusses the background and evolution of AQIM into its current form, as well as a brief overview of the affiliates that have emerged under its auspices over the past decade in the Sahel. This chapter offers a general understanding of the political, environmental, and social dimensions of AQIM and its current state. Chapter III provides a literature review of relevant, social network theories, as well as an evaluation of the current literature on terrorist network resiliency. It will provide a theoretical overview for exploring what factors contributed to AQIM's survival and expansion. Chapter IV outlines the approach and methods used in this analysis to organize, analyze, and explore the geospatial, statistical, and social network data regarding AQIM and its affiliates in pursuit of answering the research question. Chapter V explores the results of the analysis and the general conclusions that can be derived from the data. Chapter VI offers policy recommendations for U.S. military and civilian agencies to deter, degrade, and defeat AQIM and its affiliates in the Sahel, and Chapter VII provides a summary of findings and recommendations for future research on the topic.

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## II. BACKGROUND

### A. INTRODUCTION

AQIM, a trans-national terror group operating across the Sahel, has undergone multiple, organizational evolutions since its inception during the Algerian Civil War (1991-2001). The long history of AQIM's previous incarnations and the history of its migration are more thoroughly covered in other academic treatments of the organization.<sup>4</sup> The purpose of this chapter is to provide an abbreviated history about AQIM's organizational evolution.

### B. THE ALGERIAN CIVIL WAR AND THE GIA

Following a seven-year war for Independence against France, Algeria obtained its independence and set about building a modern nation-state where one had never existed. Consequently, the country saw numerous power struggles throughout the 1970s and 1980s, which led to an economically depressed and centrally controlled state. This combination of factors, along with political repression and excessive use of force against counter-state protestors, led to a government that rapidly lost its legitimacy in the eyes of the public.<sup>56</sup> The successfully government co-opted the nascent, Islamist movement in Algeria

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<sup>4</sup> See Richard Nessel, "Why Failing Terrorist Groups Persist: The Case of Al-Qaeda in the Islamic Maghreb" (master's thesis, Naval Postgraduate School, 2012) for a chronological breakdown of AQIMs establishment and organizational structure. See Khalifa Hajji, "The Origins and Strategic Objectives of the Al Qaeda Organization in the Islamic Maghreb (master' thesis, Naval Postgraduate School 2009), for an analysis of AQIM's predecessor, the Group for Salafist Preaching and Combat (GSPC), See also Mohammed Hafez's works on the Islamic Armed Group (GIA) during the Algerian civil war for a comprehensive understanding to the historical antecedents of AQIM, "Fratricidal Rebels: Ideological Extremity and Warring Factionalism in Civil Wars," in *Terrorism and Political Violence*, 2017 and "Armed Islamist Movements and Political Violence in Algeria" in *The Middle East Journal*, Autumn 2000.

<sup>5</sup> Michael J. Willis, *Politics and Power in the Maghreb Algeria, Tunisia and Morocco from Independence to the Arab Spring* (London: Hurst & Company, 2014), 162.

<sup>6</sup> Graham E. Fuller, *Algeria, the Next Fundamentalist State?* (Santa Monica: Rand, 1996), 24–28.

until the late 1980s, during which an independent Islamist movement began to emerge.<sup>7</sup>

Out of fear of losing control of the country to powerful competing political groups, the Algerian government initiated efforts at political liberalization by holding regional elections and permitting religiously-affiliated political parties to form. The Islamic Salvation Front (FIS) rapidly emerged as a mass movement that posed a significant threat to the continued power of the secular ruling government party and the military leadership.<sup>8</sup> During the first round of regional elections in 1990, the FIS gained over half the votes cast and emerged as a legitimate challenger to the state's legitimacy. To preempt their inevitable loss to the FIS in the national elections, the military leadership intervened in 1991 to cancel voting, outlawing the FIS as a political party, and imprisoning thousands of FIS members.<sup>9</sup>

In response to the state's heavy-handed repression of activists, independent armed movements emerged across the country with the goal of overthrowing the government and establishing an Islamic state. These bands of fighters consisted of a mixture of veterans of the Soviet-Afghan War that had returned to Algeria, opportunistic criminal elements, and home-grown Algerian Salafists.<sup>10</sup> The Armed Islamic Group (GIA) became the most violent of these groups to emerge.

Rather than targeting military and political leadership exclusively, as other armed groups did, the GIA was notable for targeting civilians, journalists, foreigners, and secularists, as well as competing groups.<sup>11</sup> During this time, the GIA rapidly evolved into an increasingly extreme and violent organization due to

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<sup>7</sup> Willis, *Politics and Power*, 169.

<sup>8</sup> *Ibid.*, 169.

<sup>9</sup> *Ibid.*, 171.

<sup>10</sup> *Ibid.*, 173.

<sup>11</sup> *Ibid.*, 175.



the rapid loss and replacement of experienced leaders, and its focus on recruiting members of urban criminal groups. GIA maintained strongholds in densely populated cities, and thus, were able to recruit from a large pool of unemployed young men, which enabled it to maintain its strength and replace losses inflicted by the security forces.

Additionally, the rapid loss of unit leaders at the hands of the Algerian military meant that GIA bands essentially operated independently of one another, creating a lack of organizational cohesion, but also protecting them—for a time—from security forces. This independence also meant that the bands were much more focused on local issues and fundraising rather than a more coherent national strategy that is indicative of more successful insurgent groups.

The GIA ideology during this time reflected the concept of *Jahili*, popularized by Sayyed Qutb, but with a *takfir* approach to attacking the population and government targets.<sup>12</sup> The GIA eventually internalized the doctrine of *takfir* and the *al-Muwahiddun* approach, indicating that they viewed Algerian society and government as un-Islamic and a legitimate target for attack.<sup>13</sup> The indiscriminate nature of GIA attacks against civilians and other Islamist groups led to a further alienation from the public and a gradual breakup of the remaining organized Islamist armed groups in Algeria.

GIA's message portrayed Algeria and its population as being persecuted by the world, framing France as the “far enemy” and the government of Algeria as an apostate regime, responsible for Algeria's economic and social decay.<sup>14</sup>

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<sup>12</sup> Luis Martinez, *The Algerian Civil War, 1991–1998*. (London: Hurst in association with the Centre d'Etudes et de Recherches International, Paris, 2000), 208. The term *Jahili* refers to the willful ignorance of the Muslim world toward complying with the requirements of Islamic law.

<sup>13</sup> *Takfir* is the process of declaring a Muslim an apostate and a legitimate target for violence. Modern Salafists have expanded the definition to allow for entire countries and groups to be declared unbelievers. *Al Muwahiddun*, literally “the people of monotheism” in Arabic, is a term that modern Salafists use to describe their movement, as well as their goal of restoring a golden age of Islamic civilization free of western innovation.

<sup>14</sup> Martinez, *The Algerian Civil War*, 209.

Notable within the GIA's approach to attacks, was an emphasis on targeting the economic means of Regime survival, such as its oil and natural gas export hubs.<sup>15</sup> The location of the GIA was optimal for a guerilla war, with 'complex topography, closeness to major urban centers, access to the sea, natural hiding places, and a population that had grown familiar with war.'<sup>16</sup>

Finally, high-levels of membership turnover along with an emphasis on recruiting unemployed youth resulted in rapid radicalization among its members, which subsequently led to ever greater levels of violence than seen in previous years.<sup>17</sup> The spiral of violence led to widespread public condemnation of the GIA, and the financial exploitation of the urban population eventually led to a loss of support for the GIA, especially following the qualified amnesty for fighters offered by the Algerian government in 1999.<sup>18</sup> The Fracturing of the GIA and the GSPC

In 1998, one of the remaining armed bands within the GIA, the GSPC, disavowed the GIA's indiscriminate tactics, and vowed to return to a focus on regime targets rather than perpetrating further *takfir* violence. To survive, the GSPC began to expand its operations into the Sahel to evade security forces and generate revenue to continue the fight against the Algerian state.<sup>19</sup> Despite the change in locale and its evolving targeting practices, the GSPC's goals and formal, organizational structure remained similar to the GIA's.

The GSPC faced renewed pressure from the Algerian military following September 11, 2001, and ultimately suffered a series of significant defeats. The United States' renewed interest in counter-terrorism from the United States as well as a general amnesty for combatants, sapped much of the GSPC's strength,

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<sup>15</sup> Ibid., 210.

<sup>16</sup> Ibid., 212.

<sup>17</sup> Willis, *Politics and Power*, 174, 187.

<sup>18</sup> Ibid., 187–188.

<sup>19</sup> Ibid., 195.

forcing them to migrate virtually all operational elements into the Sahel.<sup>20</sup> This migration had an unintended effect for counter-terrorism operations: the operational area of the group from approximately 86,000 square miles along the coastal region of Algeria, to over 1 million square miles in the vast ungoverned spaces of the Sahel.

### **C. THE TRANSITION FROM GSPC TO AQIM**

In an effort to revitalize their flagging organization, the GSPC rebranded itself as Al Qaeda in the Islamic Maghreb in 2006.<sup>21</sup> In an attempt to reinvigorate its operations in Algeria, AQIM pursued a campaign of terrorism in northern Algeria, conducting over 600 attacks in 2007 alone.<sup>22</sup> However, even this level of effort could not overcome the military advantages of the Algerian security forces, which slowly pushed AQIM out of the urban areas of Algeria and confined the network to the Sahel and a small pocket of mountains wilderness to the east of Algiers. As a result, AQIM's leadership, in the form of a Shura council and Emir Abdelmalik Droukdel, was confined to Algeria, while the remaining operational units were forced to move south to find funding, resources, and manpower to continue the fight. This outcome was no small feat, as the distance from Algiers to Timbuktu, a major northern city in Mali, is approximately 1,400 miles, equivalent to the straight-line distance from New York City to Dallas, Texas. In comparison, the distance within the Islamic State's territory from Mosul, Iraq to Raqqa, Syria was less than 400 miles.

It was at this point that AQIM became infamous for its kidnapping for ransom (KFR) operations. The profit from KFR of European hostages from 2008

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<sup>20</sup> Lianne K. Boudali "The GSPC: Newest Franchise in al-Qaida's Global Jihad." 2007, 6–9, DOI:10.21236/ada466539.

<sup>21</sup> Ibid., 1.

<sup>22</sup> Bennett Seftek, "Al Qaeda Thrives Across Weak West African States." *The Cipher Brief*. November 06, 2017. Accessed November 07, 2017. <https://www.thecipherbrief.com/article/africa/al-qaeda-thrives-across-weak-west-african-states>.

to 2014 is estimated to be upwards of 91 million dollars. AQIM elements, particularly Mokhtar Belmokhtar's contingent, began cultivating close ties with drug traffickers in the region to generate additional revenue.<sup>23</sup> These relationships would eventually grow into the close partnership between the Arab tribes in northern Mali, such as the Tilemsi Arabs, that participated in trafficking and AQIM's efforts to control the region.

Concurrent with the cultivation of relationships with drug trafficking organizations in the Sahel, AQIM leaders developed close ties to elements within the Tuareg community of northern Mali. The Tuaregs, a nomadic group common across Algeria, Mali, Niger, and southern Libya, have been traditionally excluded from state power and have periodically rebelled against state control over the past sixty years. Brutal state repression by Sahelian states left many in the Tuareg populations ripe for radicalization and recruitment by AQIM. Over time, Tuareg members were incorporated into AQIM units, with some even assuming leadership positions. This gradual inclusion of Tuareg members resulted would result in the establishment of Ansar Dine, an indigenous Tuareg Jihadist group aligned with AQIM. Several other locally establish Jihadist groups, which are outlined in the following section, also become patrons of AQIM.

Since its inception as AQIM in 2006, the organization has undergone four major schisms that have shaped the way it operates today. The first split occurred when the "Algerianist" jihadis of the GSPC abandoned the group between 2005 and 2007, as the GSPC leadership embraced the ideology of Al Qaeda and its global Jihadist movement over the national struggle against the Algerian government. The next major schism occurred in 2011, when many of the regular members of the AQIM Sahelian units formed MOJWA as a means of establishing an indigenous force led by local members rather than Algerian

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<sup>23</sup> Kathleen Caulderwood, "Drugs And Money In The Sahara: How The Global Cocaine Trade Is Funding North African Jihad." *International Business Times*. June 05, 2015. Accessed November 07, 2017. <http://www.ibtimes.com/drugs-money-sahara-how-global-cocaine-trade-funding-north-african-jihad-1953419>.

nationals. At around the same period, Mokhtar Belmokhtar broke with AQIM and established the group, Those Who Sign with Blood, as a means of maintaining his independence from central AQIM control, taking many of AQIM's best fighters with in the process. Finally, the most recent schism occurred when several subunits of AQIM and affiliates defected to the Islamic State in 2014, forming the group Soldiers of the Caliphate under Abdelmalek Gouri, and again later in 2016 with the establishment of the Islamic State in the Greater Sahara under Adnan Al-Sahrawi.<sup>24</sup> Each of these incidents precipitated an internal revelation of the organization and influenced the operational approach of AQIM over the past five years.

#### **D. THE ESTABLISHMENT OF THE SAHELIAN AFFILIATE NETWORK**

##### **1. AQIM Sahelian Units**

AQIM's forces in Mali consist of a loose association of armed bands which exploit the historic trade routes in the region to traffic goods and people to generate revenue for operations. The exact number of fighters and bands operating in the region is uncertain, but Yahya Abou Hamman, the Saharan Emir of AQIM, is known to supervise these efforts. Hammam is reportedly a close and a trusted advisor to AQIM leader, Abdelmalek Droukdel, and he serves as his direct representative in Mali.<sup>25</sup> Historically, AQIM viewed Mali as a resource area rather than a target; however, following the fall of Qaddafi in Libya, AQIM attempted to topple the weak Malian government with the help of Ansar Al Dine. While this effort failed, it increased the international profile and legitimacy of the group, lending AQIM additional prestige as the leader of the Islamist movement in Africa.

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<sup>24</sup> Mencherif Abid, "From Resilience to Fragmentation: Al Qaeda in the Islamic Maghreb and Jihadist Group Modularity," *Terrorism and Political Violence* (10 August 2017): 1–19.

<sup>25</sup> Counter Extremism Project. Press Release—November 2, 2017, Press Release—November 1, 2017, and Press Release—October 31, 2017. "Yahya Abu Hammam." January 12, 2017. Accessed November 07, 2017. <https://www.counterextremism.com/extremists/yahya-abu-hammam>.

## 2. Malian Jihadist Groups

The unique geographic position of Mali as the crossroads of multiple historic trade routes and waves of migration has led to a diverse ethnic composition which forms the underlying differences among Jihadist groups. Each group, while ideologically similar, is distinguished by their ethnic makeup as well as different geographic centers of power. The specific backgrounds of the major Malian groups are outlined in the subsequent discussion. The main groups are categorized by ethnic origin and year established in Table 1.

Table 1. AQIM and Affiliate Groups

Group	Leader	Primary Ethnic Group	Year Founded
AQIM	Abdelmalik Droukdel	Arab (Algerian)	2006
MUJAO	Hamada Ould Mohamed Kheirou	Multiple (non-Arab)	2011
Ansar Dine	Iyad Ag Ghaly	Tuareg	2012
Those Who Sign With Blood	Mokhtar Belmokhtar	Arab, Fulani, Tuareg	2012
Al Murabitoun	Mokhtar Belmokhtar	Arab, Fulani, Tuareg	2013
Ansar Din Sud	Souleymane Keita	Fulani	2015
MLF	Amadou Koufa	Fulani	2015
JNIM	Iyad Ag Ghaly	Arab (Malian), Arab (Algerian), Tuareg, Fulani	2017

## 3. Ansar Al-Dine

Established after Iyad Ag-Ghaly was denied a leadership position in a secular nationalist Tuareg militia, Ansar Dine represents elements of the Malian Tuareg population that are ideologically aligned with AQIM and are unwilling to

negotiate with the Malian authorities in Bamako.<sup>26</sup> Dedicated to establishing Shariah law in Mali, Ansar Dine terminated a tentative peace agreement with the nationalist Tuareg militias in 2012 and partnered with AQIM to extend Jihadist control over northern Mali in order to establish an Islamic state.<sup>27</sup> Despite the loss of their strongholds in Timbuktu, Kidal, and Gao in Mali due to the French intervention in 2012, Ansar Dine has managed to rebuild much of the capacity it lost over the past three years.<sup>28</sup> Amadou Koufa is a close ideological acolyte of Ghaly, and Koufa's MLF is reputed to have been established to extend the operational reach of AD into the densely populated southern heartland of Mali, where Tuaregs are found in much smaller numbers.<sup>29</sup>

#### **4. Movement for Oneness and Jihad in West Africa**

As AQIM integrated greater numbers of non-Algerians into AQIM, tensions arose between the Arab leadership and the different Sahelian ethnic groups such as the Fulani and Berabiche Arabs. These members broke away from AQIM and formed an allied group named the Movement for Oneness and Jihad in West Africa (MOJWA). MOJWA was the first black African Jihadist group to emerge outside of Boko Haram, and mirrored many of AQIM's operational styles, such as KFR operations and suicide attacks against military targets. MOJWA worked closely with Belmokhtar's Those Who Sign in Blood to plan and coordinate attacks in the aftermath of France's invasion of Mali, as well as coordinate operations into other countries in the Sahel. Eventually, the leaders of both

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<sup>26</sup> Daniel Cassman, "Ansar Dine." Mapping Militant Organizations. Accessed November 07, 2017. <http://web.stanford.edu/group/mappingmilitants/cgi-bin/groups/view/437>.

<sup>27</sup> Ibid.

<sup>28</sup> Ibid.

<sup>29</sup> Caleb Weiss, "Ansar Dine's branch in southern Mali releases first video." *FDD's Long War Journal*, (May 18, 2016): 1–2, accessed November 07, 2017. <http://www.longwarjournal.org/archives/2016/05/ansar-dines-branch-in-southern-mali-releases-first-video.php..>

MOJWA and Those Who Sign in Blood chose to merge their respective forces into a single organization, which became Al Murabitun.

## **5. Al Murabitun**

Al-Murabitun, or “The Sentinels,” is perhaps the most capable and experienced group operating in Mali. Led by veteran AQIM leader Mokhtar Belmokhtar, and composed of a mixture of remnants of Belmokhtar’s previous armed band, Those Who Sign with Blood, and bolstered by elements of MUJAO, Al-Murabitun has conducted multiple spectacular attacks against Western targets in Mali while continuing to engage in trafficking and kidnapping operations to generate revenue. Al Murabitun gained international notoriety after it perpetrated the In Amenas attack in Algeria, in which over 800 hostages were taken, and 37 killed during the subsequent Algerian rescue attempt. Belmokhtar’s Islamist credentials and ability to work with different ethnicities in Mali have enabled him to operate in areas that the Tuareg dominated Ansar Dine forces are unable to access. Belmokhtar’s tenuous relationship with AQIM’s senior leadership has precipitated his frequent defection and subsequent rejoining of AQIM over the past decade, leaving his loyalty to AQIM’s overall goals and strategic leadership in question.<sup>30</sup>

## **6. The Macina Liberation Front**

The MLF, established by the extremist Islamic preacher Amadou Koufa in 2015, represents the radicalized elements within the Fulani population of Mali. Relying upon exploiting Fulani grievances with other ethnic groups and the central Malian government, the MLF has rapidly emerged as a growing Islamist force in the south of the country, bypassing much of the international security

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<sup>30</sup> Counter Extremism Project. Press Release—November 2, 2017, Press Release—November 1, 2017, and Press Release—October 31, 2017. “Al-Mourabitoun.” Accessed November 07, 2017. <https://www.counterextremism.com/threat/al-mourabitoun>.



presence that is preoccupied with pacifying the north of the country.<sup>31</sup> The MLF tentatively allied with AAD in 2016, but parted ways by the end of the year due to ethnic tensions between the groups. The group's participation in the formation of the new terror group indicates that these concerns were, at least temporarily, allayed.<sup>32</sup> Because the Fulani population spans multiple borders, the group can conduct operations and generate resources in regions denied to the Tuareg and Algerian elements in the Jihadist forces.<sup>33</sup> Due to the relatively recent appearance of the MLF, there is insufficient data on subordinate actors to include in the network for this analysis.

## **E. THE MALIAN UPRISING AND FRENCH INTERVENTION**

Until 2011, the international community viewed AQIM as a regional threat, but one that appeared limited to kidnapping and criminal activities in the Sahel. The expansion of AQIM's regional area of operations is depicted in Figure 2. This view changed after the fall of Qaddafi's Libya and the exodus of several thousand armed, Tuareg mercenaries back to northern Mali. These fighters, armed with large caches of Libyan arms and ammunition, returned to Mali with the intent of establishing an independent Tuareg homeland in northern Mali.<sup>34</sup> The secular independence group, the National Movement for the Liberation of the Azawad (MNLA), sensing an opportunity to expand their control over territory, AQIM, MOJWA, and Ansar Dine established a tenuous alliance with the MNLA to drive out the Malian government from the north. In rapid succession, their

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<sup>31</sup> Emily Mellgard, "The Return of the Malian Islamists?" *Centre on Religion and Politics* (1 September 2015): 1–4, accessed 5 June 2017, <http://www.religionandgeopolitics.org/mali/return-malian-islamists>.

<sup>32</sup> Andrew McGregor, "The Fulani Crisis: Communal Violence and Radicalization in the Sahel," *The Combating Terrorism Center Sentinel*, (22 February, 2017): 34–39. Accessed 5 June, 2017, <https://www.ctc.usma.edu/posts/the-fulani-crisis-communal-violence-and-radicalization-in-the-sahel>.

<sup>33</sup> Ibid.

<sup>34</sup> Christopher Chivvis, *The French War on Al Qaeda in Africa* (New York: Cambridge University Press, 2016), 61–62.

combined forces seized much of the Tuareg heartland, while routing Malian Army garrisons. The advance of the rebel forces led to a mutiny and subsequent coup in Bamako, which left the Malian military unable to effectively resist the Jihadist advance. Sensing victory, AQIM and its allies turned on the secular Tuareg forces, driving them out of the seized cities and enforcing Sharia law on the population.<sup>35</sup> By the end of 2012, AQIM and its allies secured a haven that was larger than the entirety of Iraq, and the group was poised to attack the capital and take control of the entire state.

In early January 2013, France launched Operation Serval to defend Mali and stop AQIM's advance to the capital. French military forces in West Africa conducted multiple attacks on Jihadist military forces approaching southern Mali. In a rapid series of engagements, French forces decimated masses of AQIM, Ansar Dine, and MOJWA convoys, and eventually forced them out of the major population centers in the north by the end of the year. French special operations forces drove AQIM and its allies from their strongholds along the Algerian border, driving them away from their logistics bases and access to recruits. After six months of combat operations, France transitioned to Operation Barkhane, a smaller footprint counter-insurgency task force spread across Mali, Chad, Niger, Burkina Faso, and Mauritania, which has been operating since 2014.

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<sup>35</sup> Ibid., 70–71.

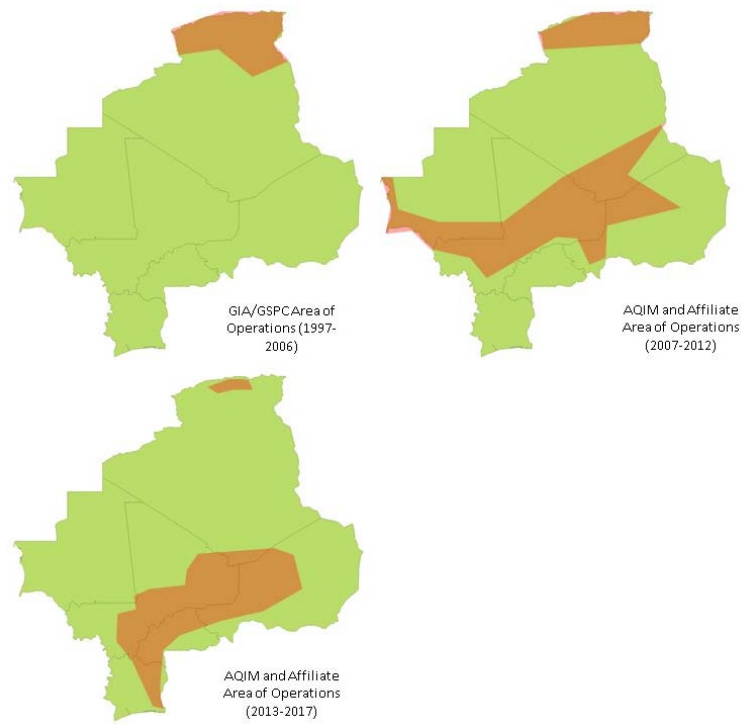
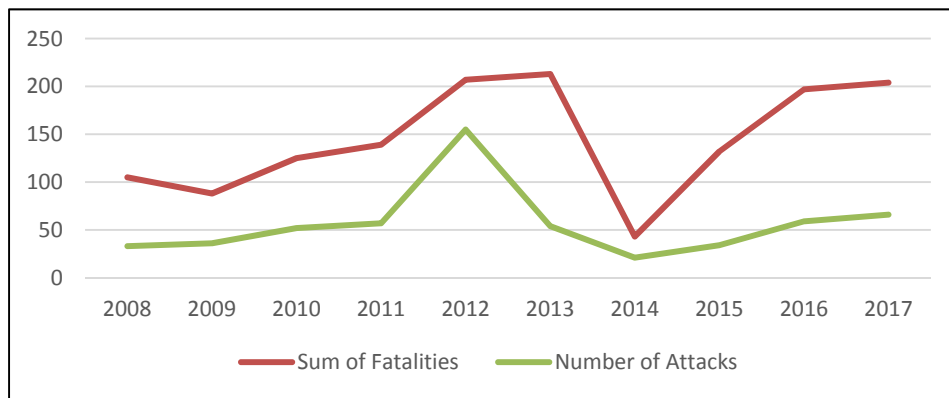


Figure 2. AQIM and Affiliate Area of Operations from 1997–2017.<sup>36</sup>



The decline in 2013 is due to Operation Serval. France transitioned to Operation Barkhane in 2014.

Figure 3. History of AQIM Attacks and Fatalities from 2008–2017.<sup>37</sup>

<sup>36</sup> Raleigh, Linke, Hegre, and Karlsen. "Armed Conflict Location and Event Data."

<sup>37</sup> Ibid.

Despite the continuous presence, and robust international commitments to defending Mali, AQIM and its affiliates has continued to conduct attacks on military and civilian targets in Mali, and the number of fatalities inflicted in these attacks have returned to pre-Operation Serval levels as depicted in Figure 3. This trend has accelerated recently, indicating the increasingly robust capabilities of AQIM despite the presence of western forces in the region.

## **F. CONCLUSION**

From its inception in the 1991 Algerian Civil War to the present, AQIM's network has continuously evolved and adapted to new environments and new opportunities. Few terrorist networks have managed to survive outside of their original environments, and fewer have managed to operate over such a vast, geographic distance. The inherently decentralized nature of AQIM operations, while a disadvantage during the Algerian civil war, has become one of the network's greatest strengths in the Sahel. Despite AQIM's major losses against French forces in 2012 and 2013, the network continues to expand across West Africa into new countries, while modifying its recruitment tactics to exploit local grievances within vulnerable minority populations.

### III. LITERATURE REVIEW

#### A. LITERATURE ON AL-QAEDA IN THE ISLAMIC MAGHREB

Despite AQIM's long and dynamic history, much of the literature is qualitative in nature and revolves around defining the component elements of the terrorist group, its ideology, its tactics, as well as larger security struggles between the group and the security forces of west Africa. Most authors endeavor to present a chronology of AQIM's history, with Andrew Lebovich and Anneli Botha representative of this regional security affairs approach to AQIM and the consequences on state stability in the region.<sup>38</sup> Other authors, such as Jean-Luc Marret, have interpreted AQIM's activities as indication that it is a hybrid "glocal" organization, where the group embraces both the local aspect of popular grievance in Africa, while continuing to espouse the international Jihad ideology of Al-Qaeda.<sup>39</sup>

Much of the remaining literature analyzes the organization as a uniform entity operating according to rational and pragmatic decision-making by the senior leadership operating in a monolithic block. Other authors such as Jean-Pierre Filiu, mindful of AQIM's rapid embrace of trafficking and smuggling operations in the Sahel, have focused on the relationship between AQIM and criminal organizations, and how that dynamic has influenced AQIM operations and even its member composition.<sup>40</sup> In this body of literature, AQIM is a security threat, rather than a political threat to instability in the region. This segment of

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<sup>38</sup> Anneli Botha, "Terrorism in the Maghreb: The Transnationalisation of Domestic Terrorism" *Institute for Security Studies Monographs* 144, 2008; Andrew Lebovich, "The Local Face of Jihadism in Northern Mali," *Counterterrorism Center Sentinel* 6, no. 6, (2013): 4–10.

<sup>39</sup> Jean-Luc Marret, "Al-Qaeda in Islamic Maghreb: A "Glocal" Organization," *Studies in Conflict and Terrorism*, 31, no. 6 (2008): 541–552.

<sup>40</sup> Jean-Pierre Filiu, "Could Al-Qaeda turn African in the Sahel?" *Carnegie Papers, Middle East Program Number* 112 (June, 2010): 1–10.

this literature often views the network as a collection of competing senior leaders pursuing individual gain while operating in the milieu of Jihadism.

In contrast to Filliu's work, Wolfram Lacher's analysis of the nexus of criminal and terror activity in the Sahel views the dynamic as a complex web of relationships among organizations and individual actors based upon kinship, tribal affiliation, and ethnicity across the Sahel.<sup>41</sup> Neither of these approaches rely upon the formal application of social network analysis to examine and quantify the network's structural characteristics as it relates to its resiliency and effectiveness.

Recently, scholars have begun to examine AQIM and its affiliate network using SNA, most notably by Olivier Walther and Dimitris Christopoulos in their study of the Jihadist and rebel network in Mali.<sup>42</sup> Their work examines the dynamics among known network actors, and it uses exploratory SNA as a means of determining key relations between actors and between subgroups of closely aligned Jihadist organizations in Mali. However, it is a static analysis of the AQIM network rather than a longitudinal one of how the network has changed in the time since the Malian rebellion. The aim of this research, which utilizes both exploratory and confirmatory SNA, is to fill the gaps in existing literature by examining AQIM's structural dynamics as they relate to its resiliency.

## **B. THEORIES OF NETWORK RESILIENCE**

Scant attention has been paid to the factors that influence whether a terrorist network will be resilient to externally or internally caused instability, and how it recovers from losses at the hands of state adversaries. Often, most

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<sup>41</sup> Wolfram Lacher, "Challenging the Myth of the Drug Terror Nexus in the Sahel," West Africa Commission on Drugs, *Background Paper Number 4*, 2013; Wolfram Lacher, "Organized Crime and Conflict in the Sahel-Sahara Region," Carnegie Endowment for International Peace, Washington, DC, 2012. 3–10.

<sup>42</sup> Olivier Walther and Dimitris Christopoulos, "Islamic Terrorism and the Malian Rebellion," *Terrorism and Political Violence*, 27, no. 3 (2015): 1–23.

terrorism analysis regarding organizational failure is centrally focused on the State's counterterrorism strategy, rather than the organization itself.<sup>43</sup> The majority of literature on terrorist groups focuses on the characteristics of the group such as leadership, tactics, and general structure rather than the environment or the way the organization changes and adapts to the environment.<sup>44</sup> For the purpose of this analysis, three models will be evaluated.

It is relevant to the current discussion to first review prominent theories about how and why terrorist groups "end." A host of scholars argue that the initial conditions that give rise to terrorism persist for the life of the group and are directly tied to how the organization ends. This argument is most often attributed to the influence of issues such as economic and social grievances in the state.<sup>45</sup> An alternative explanation focuses on the group's organizational dynamics; the success or failure of the organization is based upon the ability of the group to manage relationships within a hierarchy; to maintain a cohesive vision and ideology; and whether the actions of the group are sufficient to maintain cohesion over time.<sup>46</sup> Critics of this alternative view argue this theory is more applicable to the hierarchical and centrally controlled terrorist and separatist groups of the mid-20<sup>th</sup> century, rather than the new and emerging decentralized groups operating today.<sup>47</sup> It also fails to account for organizations operating in isolation from one another, and free of a logistics and communications network directed by a central authority.

Another theory as to why groups end is that a group's life span is dependent upon its mobilizing ideology. For instance, Cronin argues that terrorist

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<sup>43</sup> Audrey Kurth Cronin, "How Al-Qaeda Ends: The Decline and Demise of Terrorist Groups," *International Security*, 31, no. 1 (Summer 2006): 7–48.

<sup>44</sup> *Ibid.*, 8.

<sup>45</sup> *Ibid.*, 10.

<sup>46</sup> Martha Crenshaw, "Theories of Terrorism: Instrumental and Organizational Approaches." *Journal of Strategic Studies*, 10, no. 4 (1987): 19–27. DOI:10.1080/01402398708437313.

<sup>47</sup> Cronin, "How Al Qaeda Ends," 12.

groups unified by an ethno-nationalist or separatist cause have the longest life span, due partially to the support from the local communities.<sup>48</sup> However, given the limited timeframe of literature available on religiously-inspired terrorist groups, this theory is not well developed and does not have sufficient data to back up competing mobilizing factors such as religious or economic inspirations

According to Audrey Cronin, there are seven broad explanations of why terrorist groups have ended: the capture or killing of the leader, a failure to replace lost manpower, achievement or abandonment of political aims, transition to a legitimate political process, loss of popular support, government repression, and transition from terrorism to other forms of violence.<sup>49</sup> While all of these elements are significant factors in why an organization would end, by themselves, they do not explain why organizations continue to exist after one or several of these were removed. For AQIM, virtually all of these events have occurred at one time or another over the past two decades, and yet, AQIM continues to exist and threaten African states. Additionally, other researchers have found that decapitation strikes of group leadership can increase violence in a conflict, while having the effect of enabling more violent leadership to take its place, especially in religiously motivated organizations.<sup>50</sup>

The first theory of group resilience is Young and Dugan's notion of the "survival of the fittest." Arguing that some elements of terrorist group survival are independent of government action, their research finds that increasing competition among terrorist groups in a single country negatively impacts their longevity.<sup>51</sup> The authors explain that the survival of terrorist groups is directly

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<sup>48</sup> Ibid., 13.

<sup>49</sup> Ibid., 17–18.

<sup>50</sup> Aaron Mannes, "Testing the Snake Head Strategy: Does Killing or Capturing its Leaders Reduce a Terrorist Group's Activity?" *The Journal of International Policy Solutions*, 9 (Spring 2008): 40–50.

<sup>51</sup> Joseph Young and Laura Dugan, "Survival of the Fittest: Why Terrorist Groups Endure" *Perspectives on Terrorism* [Online], Volume 8 Number 2, 24 April 2014.



related to the strategic environment in which they operate and is heavily dependent upon the number of competitors for resources which determines long term survival of groups.<sup>52</sup> Additionally, the more fatalities that a group inflicts, the greater variety of attacks and tactics it employs, and its ability to attack across multiple borders, the higher probability the organization will persist for longer periods of time.<sup>53</sup> Young and Dougan hypothesize that terrorist groups endure when groups are the “Top Dog” in the environment, and are much less likely to fail than their competitors.<sup>54</sup> When faced with greater competition or groups competing for limited resources, these Top Dogs will be far less likely to fail than the new groups which suffer from “the liability of small ness” and the “liability of newness.”<sup>55</sup> This theory evaluates group survival from the perspective of a competitive terrorist economy in a country, but does not evaluate the impact of organizational change or internal and inter-organizational dynamics as a factor in group survival.

The second theory of group resilience from Blomberg, Engel, and Sawyer develops a taxonomy of groups, dividing them between “one hit wonders” and recidivist groups.<sup>56</sup> They argue that the longer an organization is conducting operations, the greater the chance it will survive to the next year, escaping the “one hit wonder” phenomenon, where the vast majority of groups only conduct one attack before disbanding or being dismantled by the security forces.<sup>57</sup> Their research finds that most terror groups only persist for 1.5 to 3 years.<sup>58</sup>

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<sup>52</sup> Ibid., 1.

<sup>53</sup> Ibid., 11.

<sup>54</sup> Ibid., 3.

<sup>55</sup> Ibid., 3.

<sup>56</sup> Brock Blomberg, Rozlyn Engel, and Reid Sawyer, “on The Duration and Sustainability of Transnational Terrorist Organizations,” *The Journal of Conflict Resolution*, 54, no. 2 (Terrorism and Policy, April 2010): 303–330.

<sup>57</sup> Ibid., 318.

<sup>58</sup> Ibid., 319.

Additionally, they find that terror groups operating in wealthier countries are more likely to survive than those in poor states. Finally, they assert that terrorist groups that execute more violent attacks endure longer than those that are unwilling or unable to maintain consistent violence against adversaries over time.<sup>59</sup> While these factors are influential in the longevity of a group, analysis indicates the effect is minimal. The authors conceded that there may be other factors that are more influential on group resiliency and longevity.<sup>60</sup>

A third theory of group resilience focuses on the network dynamics within the organization, and how shocks impact changes in the organizational structure of the network. Rene Bakker, Jörg Raab, and H. Brinton Milward's theory of Dark Network Resilience focuses on identifying why some networks are more resilient than others. They argue that the two existing social network approaches to terrorist group resilience, which they term the "network-analytic approach" and the "descriptive/historical approach," fail to understand the embeddedness of networks within the socio-cultural and historical milieu in which they operate as well as embedding historical analysis within an empirical framework.<sup>61</sup> The authors define resilience as the ability to perform a range of functions during times of stress in the network.<sup>62</sup>

Network resilience is discernible in two ways. The way by which the functions of a system absorb stress but continue to function, or by becoming degraded by external shock but restoring the capability to perform functions over time.<sup>63</sup> Bakker defines network resilience as "a dark network's ability to either remain operational in the midst of shocks or attacks ('robustness capacity') or to

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<sup>59</sup> Ibid., 320.

<sup>60</sup> Ibid., 327.

<sup>61</sup> Rene Bakker, Jörg Raab, and H. Brinton Milward. "A Preliminary Theory of Dark Network Resilience," *Journal of Policy Analysts and Management*, 31, no. 1 (2011): 33–62, doi:10.1002/pam.20619.

<sup>62</sup> Ibid., 2.

<sup>63</sup> Ibid., 3.

bounce back from untoward events by transforming itself over time ('rebounding capacity').<sup>64</sup> This capacity is a measurement of the network's pattern of operational activity, which is the extent that the organization it is able to carry out critical tasks such as attacks.<sup>65</sup> This activity results in measurable outcomes that can be affected by external shocks, which they authors define as "a sudden, dramatic increase in uncertainty" such as state repression, foreign intervention, loss of public support. Figure 3 visually depicts this shock effect.

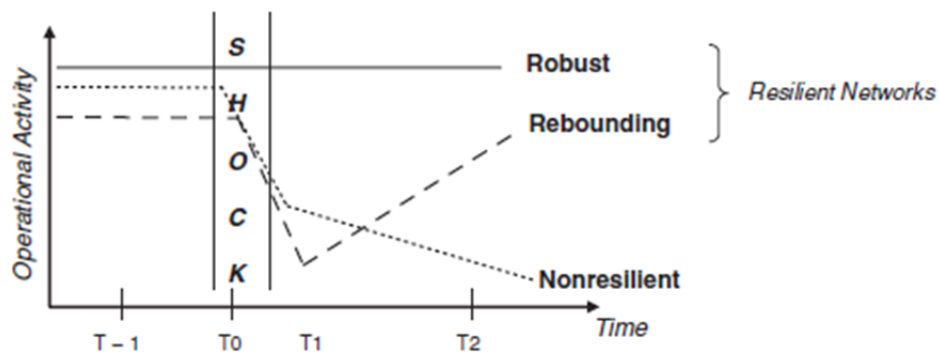


Figure 4. Bakker, Raab, and Milward's Theory of Network Resilience.<sup>66</sup>

The authors identify three types of resilience: robust, rebounding and nonresilient. Robust organizations are those that see an insignificant decrease in operational capacity following a shock. Rebounding groups are those that see a clear decrease in operational capacity following an attack, but rapidly rebuild the organization to achieve the previous level of competency. Nonresilient groups are those which lose significant capability following an external shock, and are insufficiently organized, resourced, and equipped to respond and see a significant decrease in capacity from which it cannot recover.<sup>67</sup>

<sup>64</sup> Ibid., 3.

<sup>65</sup> Ibid., 3.

<sup>66</sup> Ibid., 4.

<sup>67</sup> Ibid., 3–5.

According to the authors, capability in the context of networks consists of three functions a network needs to be able to do to recover from a shock: replace actors, replace broken links between actors, and balance differentiation and integration.<sup>68</sup> The ability to replace nodes indicates that networks must be able to replace actors within the network as they are killed, captured, or quit. The second ability, replacing linkages, indicates that for networks to recover they must be able to actively re-establish relationships between actors and organizations within the network to maintain communication. Finally, the ability to balance differentiation and integration is a critical element of dark network resilience. To evade targeting and disruption by state security forces, dark networks must forego the operational efficiency gained by specialization—in the form of specialized logistics, communications, operational elements—and rely instead upon redundant or self-contained elements that can operate at less risk of exposure. Finding a balance in structure is essential for group survival, as centralizing a network and differentiating elements can increase operational capacity, yet make the network more vulnerable. Likewise, erring too far in being decentralized and undifferentiated can slow operational activity to the point that the organization loses the ability to conduct attacks. The results of this literature clearly indicate that the crucial distinction between groups that are resilient and those that are defeated is in how quickly a network can adapt to external shocks to the network and the loss of capabilities.

### **C. CONCLUSION**

Despite the large body of research on how terrorist groups end, little research has been focused on the processes and mechanisms of why groups survive. Additionally, only a small portion of the literature is focused on the internal actions of the organization as a deciding factor in survival, with much of the research focused on the effectiveness of state security forces and

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<sup>68</sup> Ibid., 18.

counterterrorism policies as the central focus. What is required is a structural-focused approach to evaluate the resiliency of the AQIM network, with the goal of developing targeted policy recommendations that accounts for the dynamics of AQIM and its affiliate organizations in West Africa.

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## IV. APPROACH AND METHODOLOGY

### A. SOCIAL NETWORK ANALYSIS

Social network analysis is a methodology that allows researchers to evaluate and explore the relationship among entities within a system. By analyzing the connections among actors within the boundaries of a specific network, inferences about the flow of information, the relative importance of different actors within the network, and the general structure of the organization provides insight into how the social ties between actors enable or constrain the behavior and actions of individuals as well as groups.<sup>69</sup>

This research utilizes both descriptive statistics and regression analysis of social network data to explore the changes within the AQIM network 2012 to 2017. The purpose of this analysis is to examine the network's resiliency and to identify factors contributing to the expansion of AQIM's operational network. Specifically, this analysis examines network topographic metrics and quadratic assignment procedure (QAP) regression, which is a multivariate regression method designed for examining relationships among networks (i.e., matrices)

In terms of descriptive statistics, this research focuses exclusively upon network topography measures because they describe structural characteristics of networks, and highlight tradeoffs that networks might have to make regarding effectiveness and resilience.<sup>70</sup> Specifically, this analysis uses network density, centralization, and fragmentation to examine AQIM's network over time. Density measures the number of ties in a network, but expressed as a fraction of the total number of ties possible on a scale of 0 to 1, with 1 being a completely

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<sup>69</sup> Cunningham, Daniel, Sean Everton, and Phillip Murphy. *Understanding Dark Networks: a Strategic Framework for the Use of Social Network Analysis* (Lanham: Rowman and Littlefield, 2016), 3.

<sup>70</sup> *Ibid.*, 85.

interconnected network where everyone knows everyone, and 0 being a network where no actors are connected to one another.<sup>71</sup> This metric is only useful when comparing networks of similar number of actors, since the proportion is highly sensitive to the overall size of the network. As the number of actors in a network increases linearly, the possible links between all actors increases exponentially, indicating that large networks may have a relatively high number of linkages, but not in proportion to the overall numbers of possible linkages.<sup>72</sup>

Fragmentation is another valuable metric for understanding the general arrangement of the network. Fragmentation measures the proportion of actors who are unconnected to one another. This measure is useful for determining how the network has responded to increased security force pressure over time. In many cases, groups will fragment as key leaders are eliminated, or as a deliberate strategy by the network to protect itself from detection and targeting by police and security elements.

Centralization is the final metric applied in this research's descriptive analysis. Centralization depicts the network along a continuum of network control: on one end of the continuum are highly decentralized networks, or along the other are highly centralized hierarchical networks. The optimal level of centralization depends upon the environment in which a network operates. Decentralized organizations allow for rapid adaptation to changes in the security environment; however, if they are too decentralized groups may lose the ability to leverage resources and enforce discipline within an organization.<sup>73</sup> Therefore, terrorist groups tend toward lower levels of centralization to reduce the risk to

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<sup>71</sup> Stephen Borgatti, Martin Everett, and Jeffrey Johnson, *Analyzing Social Networks*, (London: Sage Publications, 2013), 152.

<sup>72</sup> Average degree was not used as an alternative measurement, as both the networks are of the same approximate size.

<sup>73</sup> Sean Everton, and Daniel Cunningham. 2013. "Terrorist Network Adaptation to a Changing Environment," in *Crime and Networks*, edited by Carlo Morselli (London: Routledge, 2013), 287–308.



exposure if elements are captured or killed. Of the several measures of centralization, we will focus on degree and betweenness centralization. The variation in actor centrality is used to determine the centralization of a network, with higher variation in actor centrality providing for higher levels of overall network centralization. The larger the centralization score, the more hierarchical the network is and the more important a few central actors are in managing the organization.<sup>74</sup>

Degree centralization is based upon degree centrality, which counts the number of ties each actor possesses. An actor with a high number of ties relative to the rest of the network is said to have high degree centrality. Degree centralization is a reflection about the distribution of network ties across the network; a centralized network is one in which one or a few actors possess most of the ties present within the network whereas a decentralized network is one in which actors possess a similar number of connections.

Betweenness centralization is based upon betweenness centrality, which measures the position of actors that lay on the shortest path between actors. This metric indicates a position of brokerage between different elements within the network and the ability to control the flow of resources across the network. Betweenness centralization a measurement of how much a small number of actors can influence the transfer of information and resources within the network. A high betweenness centralization score indicates that a small number of actors have a great deal of influence in controlling information flow in the network, while a low score indicates that the responsibility for exchange is widely distributed across the network. Though several other centralization indices exist, this analysis focuses primarily on degree and betweenness centralization.

QAP is a “procedure” that involves several underlying statistical steps. The first step is to correlate two matrices, which produces an “observed correlation.”

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<sup>74</sup> Ibid., 287–308.

Second, QAP utilizes permutation tests to generate statistical significance by generating thousands of random variations of the selected matrices, while maintaining the same structural properties as the networks being tested.<sup>75</sup> By generating large numbers of random matrices, QAP can determine levels of correlation between the randomly, generated networks and the dependent network (e.g., Operational Network). For example, QAP can determine the correlation between operational, logistical, friendship, and kinship networks. Matrices that correlate with a p-value less than 5% are considered statistically significant, that is there is a 95% chance that the correlation did not occur randomly.

Because the AQIM operational network is a dichotomous network, meaning that the data only indicates whether a relationship exists and not the strength of that tie between actors, this research relies upon the use of logistic regression QAP (LR-QAP) to examine the correlation among several one-mode networks and the one-mode operational network.<sup>76</sup> Because data supporting a valued network for AQIM members in the selected time frames is unavailable or reliable, Multiple Regression QAP (MRQAP) is unsuitable for the analysis. LR-QAP enables the researcher to identify which networks, or independent variables, contribute to (or “predict”) the structure of a dependent variable network, which in this case, is the operational network. The operational network represents the relationships between key actors within the AQIM affiliate network in 2012 and 2017.

To estimate a LR-QAP model, this project utilized the R statistical software package, which supports SNA modeling and data manipulation. The two-mode ethnic affiliation, nationality, tribal affiliation, and organizational affiliation networks were transformed in UCINET into one-mode networks, which depicted

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<sup>75</sup> Borgatti et al., *Analyzing Social Networks*, 132–133.

<sup>76</sup> A one-mode network is built around nodes of the same type. For example, a network that only looked at the relationships between individuals would be a one-mode network.

relationships between actors that shared an attribute. While affiliation does not necessarily indicate a relationship between actors, identifying the potential factors that give rise to the operational network provides insight into a network where very little is known about relational data. Essential to the operations of dark networks is trust, and while direct relationships can only be inferred, it can be assumed that ethnic, tribal, and nationality affiliation has a positive effect on the development of trust between disparate terrorist groups in the Sahel. Failing to infer ties from two-mode networks would leave us with little relational data to leverage in this analysis.

## **B. GEOSPATIAL ANALYSIS**

Geospatial analysis provides insight into networks by enabling researchers to visualize the geographic distribution of AQIM and affiliate attacks across the Sahel over time. In others words, networks not only operate relationally, but they also operate in “space” and across time. The use of Geographic Information Systems (GIS) enables researchers to visually illustrate patterns and trends in terrorist attacks, as well as the ability to explore geographic factors that may be a determining factor in the operational reach or limitations of terrorist groups operating in different terrain around the world.

The purpose of spatial analysis is to provide insight into the geographic distribution of attacks, environmental factors that influence operations, and the human terrain of a particular region. For this research, the author employed QGIS, an open-source GIS, for all attack data visualizations. The data utilized for this project focused on AQIM and affiliate operations in the following countries: Algeria, Niger, Burkina Faso, Cote D'Ivoire, Mauritania, and Mali. Events that were included in the AQIM dataset include the following types can be found in the Appendix.

ACLED codes event with spatial coordinates which provides geographic locations for all events, and is as precise as can be achieved with open-source

reporting of events. This includes data coding the event for the first, second and third level administrative areas for the nation in which it occurred.

### **C. DATA**

The AQIM network serves as a relevant case study for exploring dark network resilience in response to state counter-terrorism strategies. The groups evolution from an Islamist criminal-insurgency in Algeria in the 1990s, into a Salafist trans-national criminal trafficking organization, and finally into an enabler of trans-national terrorism across the Sahel speaks for the flexibility and resiliency of the organization over time. To organize and code the AQIM network, a variety of open-source documents were used to illuminate the operational network, as well as the less defined two-mode networks. The 2012 AQIM operational network was validated by comparing it to the network developed by Olivier Walther and Dimitris Christopoulos in their work analyzing the Islamist and Rebel networks in the Malian rebellion.<sup>77</sup> With the validated 2012 Network, we determined which actors within the network were still known to be active in 2017, which had been imprisoned or killed, and which actors had changed affiliation to diverse groups in the five years since the Malian uprising. Additionally, actors that emerged from obscurity in 2012 and rose to prominent roles within the network were added to the 2017 matrices and the known ties coded. This resulted in two operational networks, one for 2012 and another for 2017, which each formed a 50x50 matrix that could be analyzed for the change in network topography over time to determine changes within the network.<sup>78</sup> Two-mode data, such as tribal, nationality and kinship affiliation, was also coded into separate networks. Attribute data, which consists of data that is not relational, was coded and included information on static information. The specific coding

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<sup>77</sup> Walther and Christopoulos, "Network Analysis of Islamic Terrorism."

<sup>78</sup> Since both the 2012 and 2017 Operations Networks are identical size 50x50 matrices, network density is used rather than average degree.

information can be found in the network codebook appendix. The table below outlines the scale of the network data:

Table 2. SNA Network Data Organization

One-Mode Networks	Two-Mode Networks	Attribute Data
AQIM Operations 2012	Nationality	Actor Status
AQIM Operations 2017	Tribe	Organization Membership
Kinship Ties	Ethnicity	Ethnicity
Nationality Ties (two-mode to one-mode conversion)	Organizational Membership	Tribe
Tribal Ties (two-mode to one-mode conversion)		Nationality
Ethnicity Ties (two-mode to one-mode conversion)		Role
Organizational Membership (two-mode to one-mode conversion)		Previous Group (most recent)
		Previous Group (less recent)
		Previous Group (least recent)

#### D. BOUNDARY

The network data consist only of individuals who are known members of AQIM and affiliates within the countries affected by AQIM attacks. This includes the four existing member groups of JNIM, as well as actors of the Movement for Unity and Jihad in West Africa (MUJAO), who subsequently joined Mokhtar Bel Mokhtar’s Al-Mourabitoum terrorist group. Additionally, given the limited knowledge of tactical level members and support personnel, this analysis is restricted to the senior operational and organizational leadership of each of the armed bands pledging allegiance to the JNIM.

## **E. CONSIDERATIONS**

Given the nature of open-source reporting, especially from sources from less rigorous news agencies in the region, there is the possibility that ties have been coded which do not exist, and likewise, there may be relationships that do exist but have been incorrectly reported by news media. However, many of the primary AQIM actors have been profiled in detail during their long operational history, and their operational relationships are well understood. With this limitation in mind, the data is used primarily to demonstrate the response of the network to state pressure, rather than determining actor level.

## **V. RESULTS AND ANALYSIS**

### **A. INTRODUCTION**

This chapter explores the results of the geospatial, SNA, and temporal analysis of AQIM and its affiliates in order to explore the network's ability to remain resilient over time. Additionally, it examines several hypotheses regarding AQIM's operational network. These deductions will provide the base for policy recommendations in the subsequent chapter.

### **B. TEMPORAL AND GEOSPATIAL ANALYSIS**

Analysis of attack data from 1997–2017 indicates that the AQIM network is concentrating its operations in the unstable countries of the Sahel and is either unable or unwilling to conduct more frequent operations within Algeria. In 2007, the year in which AQIM became operational, it conducted thirty attacks; all but four were in Algeria. As AQIM's freedom of movement and resources in Algeria declined, its Sahelian area of operations increased in importance. In 2012, at the height of the Malian conflict, AQIM and its affiliates conducted 155 attacks in the region, with thirty-two occurring in Algeria, and over one hundred occurring in Mali. The geographic distribution of AQIM attacks over this time period is depicted in figures 5 and 6. As of September 2017, AQIM and its affiliate organizations have only attempted a single attack in Algeria, out of sixty-six attacks so far. The remainder were split between Burkina Faso, Niger, Cote D'Ivoire, and Mali. This provides evidence that AQIM and its affiliates have shifted their strategy to focus on prioritizing attacks on the Sahelian states at the expense of a continued effort to topple the Algerian government.

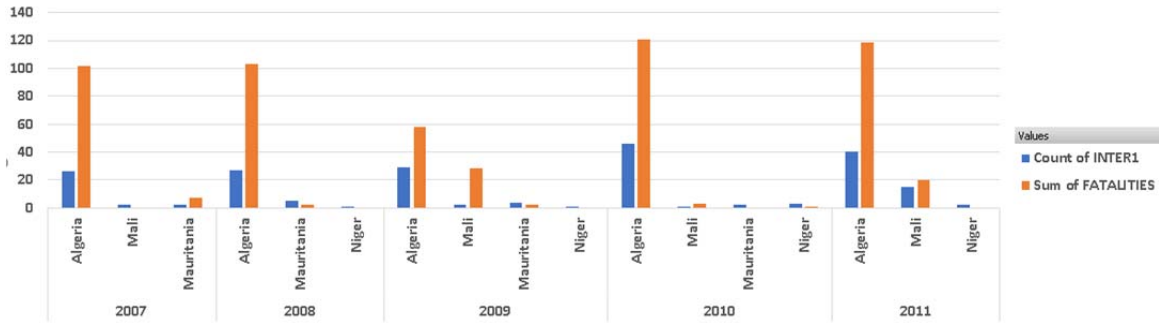


Figure 5. AQIM and Affiliate Attacks by Geographic Concentration (2007–2011).<sup>79</sup>

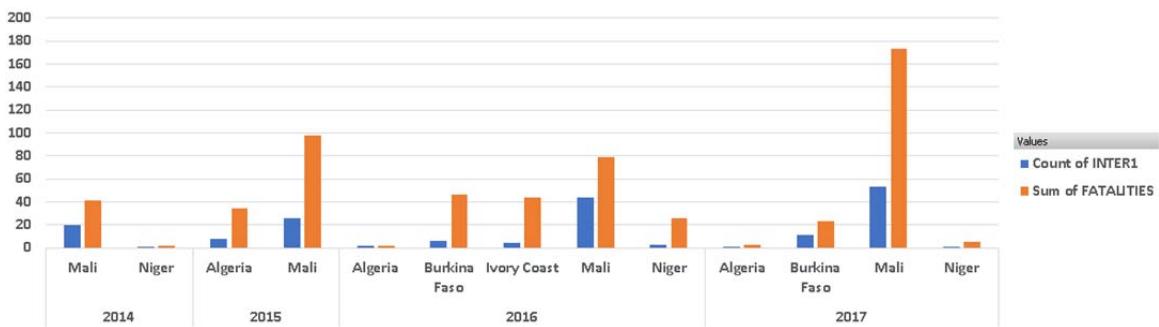


Figure 6. AQIM and Affiliate Attacks by Geographic Concentration (2014–2017).<sup>80</sup>

Secondly, temporal and geospatial analysis of AQIM attack patterns from 1997–2017 graphically depict the migration of attacks from the densely populated Algerian coastal regions to the sparsely populated regions of northern and central Mali and western Niger. From 2007–2011, most AQIM's attacks were centered on the Algerian provinces of Boumerdes and Tizi Ouzo, which were also historic areas of high numbers of GIA and GSPC attacks. However, from 2012–2017, the regions of Gao, Kidal, and Timbuktu in Mali were the areas of

<sup>79</sup> Raleigh, Linke, Hegre, and Karlsen. "Armed Conflict Location and Event Data." Count of Inter refers to the number of interactions (i.e., attacks, between AQIM and government forces or attacks on civilians). The blue bar depicts number of attacks, while the yellow bar indicates fatalities.

<sup>80</sup> Ibid.



highest concentration of AQIM and affiliate attacks, as depicted in Figure 7. This shift indicates a gradual emphasis away from Algeria and toward the Sahel as a primary operational area. Additionally, two of those three regions—Gao and Timbuktu—sit astride ethnic fault lines between the northern Arab-Berber populations and the southern sub-Saharan populations, likely exacerbating violence between ethnic groups and Jihadist elements composed of competing ethnic minorities. These ethnic fault lines are depicted in Figure 8.

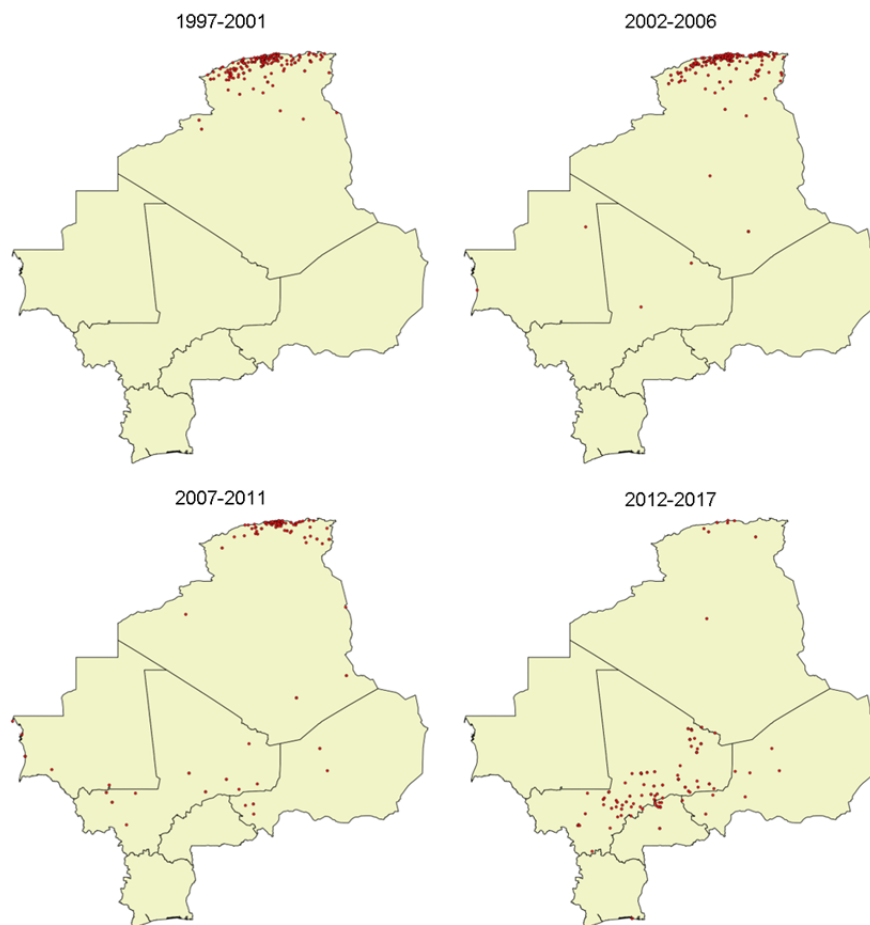


Figure 7. AQIM and Affiliate Attacks in West Africa from 1997–2017.<sup>81</sup>

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<sup>81</sup> Ibid.

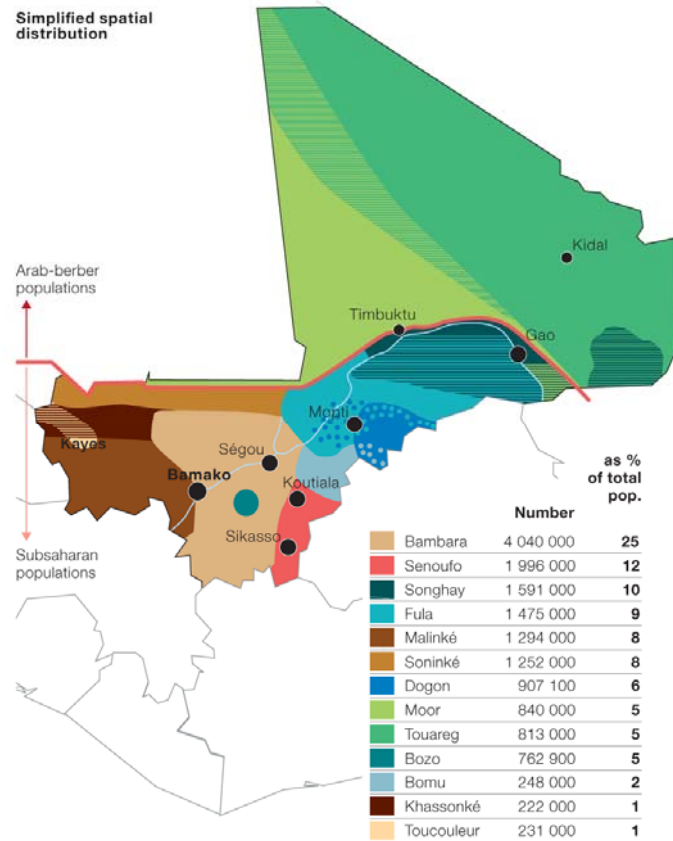


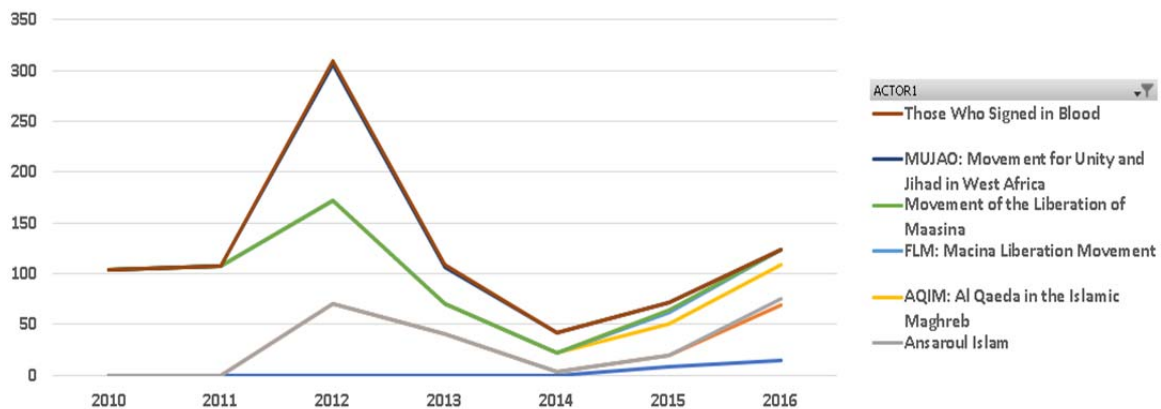
Figure 8. Malian Ethnic Map.<sup>82</sup>

Further analysis of AQIM attack patterns over time indicate that Operation Serval in 2012 significantly degraded the ability of AQIM to conduct spectacular attacks in west Africa, at least temporarily. From the end of 2012 until 2014, AQIM and its affiliate groups faced significant pressure from Malian and other counter-terrorism forces, which appears to have led to a major decrease in AQIM and AQIM affiliate attacks and civilian fatalities. This change is depicted in Figure 9. However, once the majority of French forces withdrew from Mali, and the remainder transitioned to the stability-focused Operation Barkhane in 2014, AQIM was able to gradually increase both the frequency and lethality of attacks

<sup>82</sup> OECD, Sahel and West Africa Club, "Atlas Jeune Afrique 2010," 191. Accessed December 01, 2017. <https://www.oecd.org/swac/maps/11-population-North-Mali.pdf..>

across the region.<sup>83</sup> The geographic concentration of attacks by each group is depicted in Figure 10.

In 2017, AQIM and affiliate attacks have returned to the pre-Malian crisis levels, but in a greater number of countries across the region. More significantly, the lethality of AQIM’s attacks are now at the same level as they were during the height of the Malian conflict despite a reduction in the overall number of attacks during that time. Therefore, the data suggests that AQIM and its affiliate network have been able to rebuild its operational efficiency as indicated by its ability to remain extremely lethal despite a fall in its raw number of attacks. Furthermore, this trend suggests that AQIM has been able to recoup much of its lost logistical, intelligence, training, and planning capacity lost during the French intervention as well as demonstrating that even the newest affiliates are capable of planning and executing spectacular attacks in the region.



The decline in 2013 is due to Operation Serval. France transitioned to Operation Barkhane in 2014.

Figure 9. History of AQIM attacks from 2010–2016.<sup>84</sup>

<sup>83</sup> Fatality data includes attacks on civilians, local security forces, and international military forces operating in the region.

<sup>84</sup> Raleigh, Linke, Hegre, and Karlsen. “Armed Conflict Location and Event Data.”

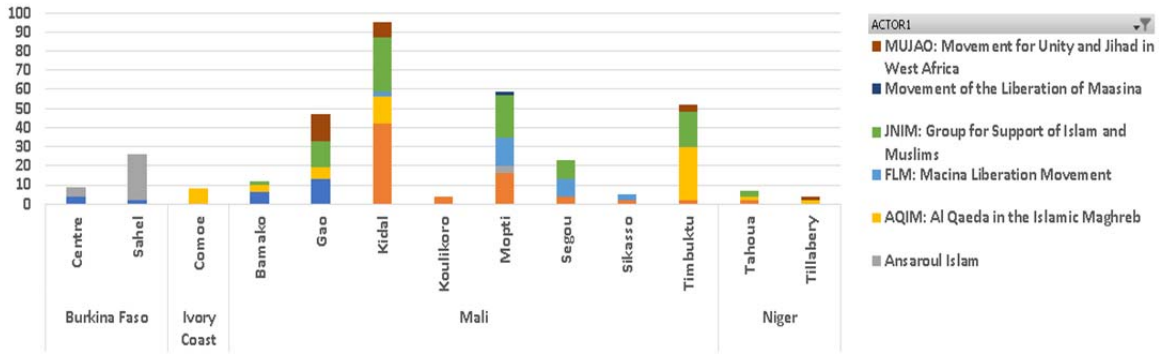


Figure 10. Geographic Concentration of AQIM Attacks and Perpetrator.<sup>85</sup>

### C. SOCIAL NETWORK ANALYSIS

The results of the social network analysis provide insight into how the AQIM network has adapted since the 2012 Malian conflict. Using basic network topographic measurements such as density, fragmentation, and centralization, data on the 2012 and 2017 AQIM Operational network illuminates the changes within the organization following the major shock to the network (i.e., Operation Serval). Figure 11, AQIM's network prior to Operation Serval, and Figure 12, the network as it exists today, depicts the proliferation of armed groups affiliated with AQIM yet operating along ethnic lines. Table 3 presents the change in values between the network prior to the French invasion in early 2013, and those as of September 2017.<sup>86</sup>

Changes in density and fragmentation suggest the network has become less cohesive since Operation Serval, while the change in degree centralization suggests that the network has become slightly less centralized. However, when compared to other dark networks, the measures of centralization indicate that the

<sup>85</sup> Ibid.

<sup>86</sup> Due to a lack of intermediate longitudinal data between these two dates, there is no method to discern if there were any intermediate increases or decreases in the measurements within the network. As the data demonstrates, AQIM's operational network has maintained a relatively low density over the course of the conflict, likely as an environmental response to the vast area of operations, and also as a means of protecting the individual elements operating in the region from detection.

network is neither overly centralized or decentralized.<sup>87</sup> The network has become more fragmented over time, either as a result of attacks on the network or through a deliberate strategy of minimizing risk to component elements. Given the increased operational tempo in the Sahel, and a decrease in foreign presence in Mali, future trends may indicate that AQIM and its affiliates are planning and coordinating attacks more closely as joint efforts between affiliates, especially those operating under the JNIM umbrella.

While descriptive analyses illuminate structural patterns in AQIM's operational network, LRQAP provides the opportunity to examine how AQIM utilized existing relationships to maintain its operational network. Specifically, this analysis examines if and how ethnicity nationality, kinship, tribal, and organizational ties predict the 2012 and 2017 operational networks. The results, presented in Table 4, show the nationality and organizational ties are significant predictors of AQIM's 2012 operational network. Data also indicates that kinship significantly contributed to the structure of the network, primarily among those actors that benefited from ties developed from marriage. This supports the general assessment that Algerian nationality defined much of AQIM's leadership. Additionally, the LRQAP results support the theory that organizational affiliation played a significant role in the operational network between AQIM and its affiliates prior to the Malian crisis, as many of the attacks were conducted by individual elements working autonomously rather than collaboratively.

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<sup>87</sup> Daniel Cunningham, Sean Everton, and Philip Murphy, *Understanding Dark Networks*, 94–95. Networks vary greatly in centralization from one organization to another, however, the betweenness centralization and degree centralization for the AQIM network fall roughly in the middle of the spectrum of known groups.

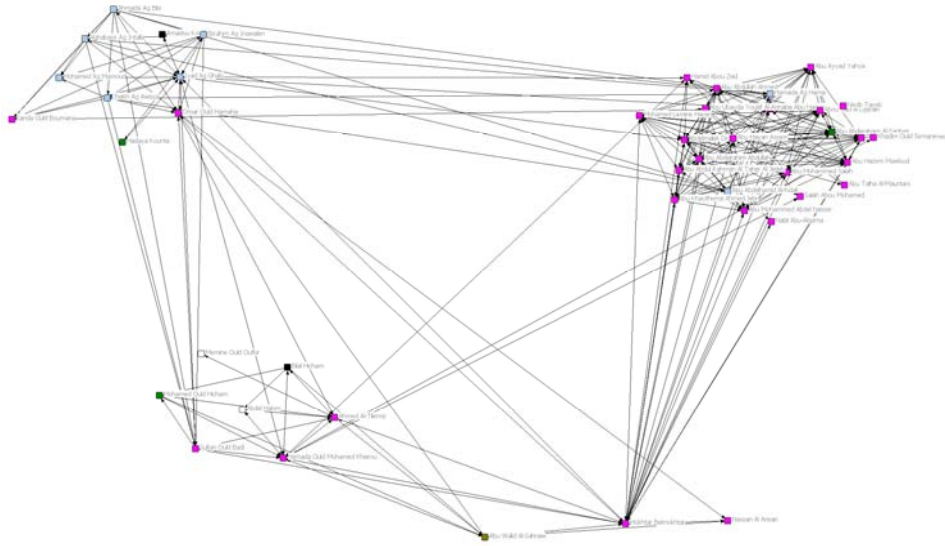


Figure 11. AQIM and Affiliate Network (2012).<sup>88</sup>

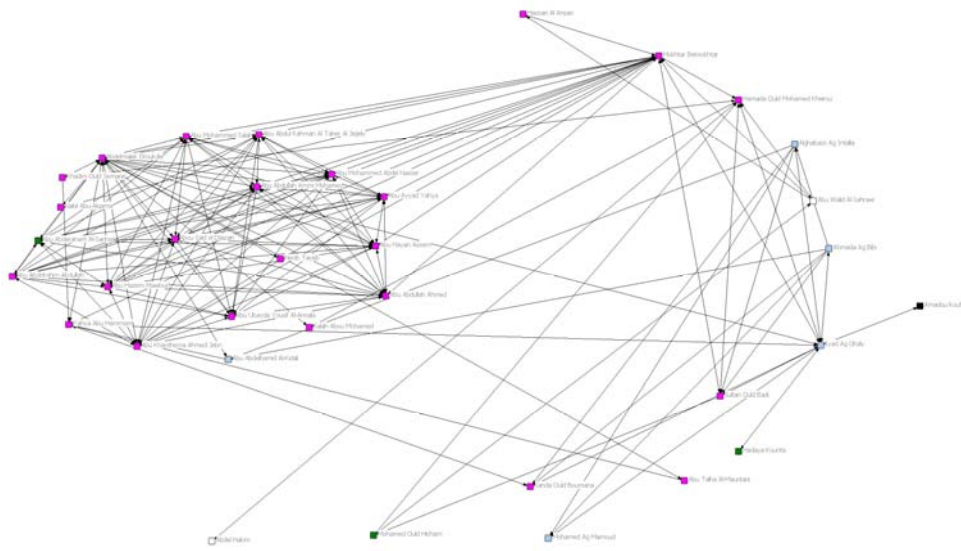


Figure 12. AQIM and Affiliate Network (2017).<sup>89</sup>

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<sup>88</sup> Sociogram depicts the three main organizations during the 2012 Malian uprising: AQIM (top right corner), MUJAO (bottom left corner), and Ansar dine (top left corner). Actors are color coded to indicate ethnicity.

<sup>89</sup> Sociogram depicts the main AQIM and affiliate organizations in 2017. Actors are color coded to indicate ethnicity.

Table 3. AQIM Operations Network Topography

Network Measurement	AQIM Operations 2012	AQIM Operations 2017
Density	0.142	0.115
Fragmentation	0.245	0.424
Degree Centralization	0.346	0.338
Betweenness Centralization	0.216	0.357

However, by 2017, it appears AQIM's operational network also began to rely on ethnic ties. The results presented in Table 4 illustrate the dramatic increase in the relevance of the ethnic affiliation of the actors within the network as a factor in the structure of the Operations network I 2017. As AQIM was denied access to traditional areas to recruit from in the Algerian heartland, it was forced to recruit from Sahelian ethnic groups in greater numbers as well as relying on armed Islamist groups that formed around ethnic identity. The coefficient of determination (Pseudo R-Square) of both models indicates that the component subnetworks predict approximately 59% of the structure of the AQIM Operations network in both 2012 and 2017.

Table 4. AQIM Operational Network (2012) LR-QAP Results

Network	AQIM Operations 2012	AQIM Operations 2017
(Intercept)	-3.611	-3.520
Ethnic Affiliation	0.591	1.095**
Nationality	1.756***	1.385***
Kinship	1.578*	-0.936
Tribal Affiliation	-0.195	-0.039
Organizational Affiliation	1.833***	1.085**
AIC	716.814	706.818
Pseudo-R-Square1	0.447	0.450
Pseudo-R-Square2	0.585	0.591

Note: N=50, \*p<.05, \*\*p<.01, \*\*\*p<.001 (two-tailed).

#### D. CONCLUSION

The analysis of geospatial and social network data provides valuable insights into AQIM and its affiliate networks in the Sahel that corroborates

existing qualitative literature as well. Despite the losses suffered during the French intervention in 2012, and an increasing presence of U.S. and international peacekeeping forces since then, AQIM and its affiliates continue to grow and expand throughout west Africa. Following the shock to the network after the intervention, AQIM became a less dense and more fragmented network as a means of protecting its component elements from direct attack. However, as the pressure from Western security forces abated after the 2014 transition to Operation Barkhane and a more stability focused effort, AQIM and its affiliates dramatically increased its attack frequency as well as its lethality across multiple countries. This increase in frequency to the pre-2012 period indicates that the operational network has regained the capacity to plan, resource, and execute complex attacks across the region.

Additionally, the network has evolved from an organization based primarily upon the nationality of its members, to one that is defined to a greater degree by the ethnic affiliation of its members. While this has increased the numbers of factions within AQIM, these groups are able to recruit from within their ethnic communities and identify with the particular grievances that motivate violent action against the state and their Western allies.



## **VI. POLICY RECOMMENDATIONS**

AQIM is a resilient and adaptable network which has survived multiple incarnations as a terrorist organization since its inception in the early 1990s. Despite its most recent dramatic losses against French forces in Mali, the network continues to persist and it maintains at least a basic level of capability to plan and conduct spectacular terror attacks against governments in west Africa. There are several strategies available that the United States and its allies can execute to degrade the AQIM network.

### **A. CONSIDERATIONS**

One of the first things that need to be considered when developing strategies to destroy AQIM is the size of the operational area. AQIM and its affiliates operate in a region which is approximately the area of Texas and Alaska combined, making it incredibly difficult to effectively guard porous borders and isolate AQIM elements from seeking safe haven in bordering countries. Local security forces that are insufficiently equipped to conduct long range operations in desert conditions are unlikely to be able to sustain operations to find, fix, and finish AQIM units operating deep in the Sahel. Additionally, the size of the region makes the use of intelligence, surveillance, and reconnaissance (ISR) collection assets more difficult. Additional time and assets are required to provide adequate coverage of likely AQIM operational bases or staging areas, and persistent observation by U.S. ISR platforms is likely an impossibility given current operational requirements in other theaters.

An additional consideration for any strategy are the human rights concerns of using local forces to combat AQIM. The ruling ethnic groups of most west African nations are hostile to the ethnicities that AQIM most frequently recruits from. As a consequence of this, many military actions take on the dimensions of ethnic cleansing, or at least have the potential to escalate into perceived ethnic cleansing by the population. This would further exacerbate the tension between

the local government, the United States, and the local population which would provide ample opportunity for AQIM and its affiliates to exploit for propaganda value.

A final consideration for executing an anti-AQIM strategy in West Africa is political will. The use of remote attacks by unmanned aerial vehicles minimizes the risk to U.S. pilots and military resources, but potentially incur high political costs to U.S. leaders and the U.S. reputation in the region. While drone strikes have been very successful at targeting and eliminating terrorist leadership in Yemen, Afghanistan, and Pakistan, in each of those instances the U.S. lost rapport with the host government, the local population, and among allies who challenged the legality of conducting strikes in another state's sovereign territory. The decision to pursue remote drone strikes against terrorist leadership or concentrations of AQIM members in the Sahel needs to be weighed against the potential political backlash by partner nation governments and the potential for public opposition which may lead to the peaceful or violent removal of the partner nation's government.

## **B. KINETIC AND NON-KINETIC APPROACHES**

The kinetic strategies available to the United States consist primarily of the use of a lethal approach to targeting and removing key actors in the AQIM network . This would likely consist of activities with low political risk and a small footprint of special operations forces (SOF) rather than the more visible use of conventional combat troops or armed drone strikes. SOF working closely with partner national counterterrorism forces in Mali, Niger, and Mauritania using national level intelligence assets to locate and target key leaders such as Iyad Ag Ghaly and Mokhtar Belmokhtar in order to remove them from the AQIM network. In the event that key actors are operating in countries where there is public support for U.S. drone strikes, such as in Libya, drones may be used to remove key actors from the network.

The long service and experience of AQIM unit leaders means that the loss of key members would lead to a significant reduction in the operational competency needed to conduct complex or spectacular attacks as well as the removal of key linkages between operational units in the network. Simultaneous to ongoing precision attacks, U.S. advisors would collaborate with local counterterrorism forces to build local capacity to target and destroy the links between AQIM and the communities that support them. While the recent deaths of U.S. service members in Niger demonstrate the risk inherent in this approach, the failure to apply kinetic force to degrade AQIM in the region forfeits the operational initiative to the terror network, enhancing their ability to spread and recruit in the Sahel.<sup>90</sup>

A second strategy involves the use of non-kinetic approaches to dismantling AQIM. While poverty and the lack of government services is not a factor driving the population toward AQIM, it is an exploitable issue that AQIM uses to generate support for its cause. Institution building through bilateral U.S. and African partner nations in rule of law, judicial practices, human rights, and democratic practices may alleviate the underlying sources of public discontent which may fuel radicalization. Targeted outreach to at-risk populations in minority ethnic groups has proven to be successful in Niger, where the Tuareg population has come to a relatively stable peace with the central government.<sup>91</sup> A well-resourced disarmament, demobilization, and reintegration program at the national level has been successful in draining insurgent and terror organizations of their peripheral members while at the same time strengthening public support

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90 Madison Park. "Niger ambush: Timeline of attack that killed 4 U.S. soldiers." *CNN*. October 24, 2017. Accessed December 01, 2017. <http://www.cnn.com/2017/10/24/politics/niger-ambush-timeline/index.html>.

91 Thurston, Alex. "With Eye on Mali, Niger Adopts New Strategy for Tuareg North." *World Politics Review*. October 08, 2012. Accessed December 01, 2017. <https://www.worldpoliticsreview.com/articles/12400/with-eye-on-mali-niger-adopts-new-strategy-for-tuareg-north>.

in the government's cause. Unlike the kinetic approach, the non-kinetic strategy would require a long duration commitment to political programs and significant financial resources to improve the lives of the target populations.

A third strategy involves containing AQIM in the sparsely populated Sahel region and away from population centers. The resource requirements to conduct static defense against a mobile terrorist group are significantly less than manning, training, and equipping a dedicated counterterrorism force which must actively pursue the enemy in hostile terrain and with limited to no capacity for medical evacuation or resupply. Investing in infrastructure to post military forces in population centers that are near AQIM safe havens would increase the risk and costs for the network associated with recruitment efforts, planning spectacular attacks, and gathering resources such as food, water, and equipment.<sup>92</sup> This is not radically different than how prior counterinsurgency campaigns were waged to isolate the population from the insurgents, however, given the small populations in these regions and the vast distances between population centers there is little or no possibility of relocating populations to more secure areas. Therefore, a concerted effort to make villages and towns more secure against AQIM attacks or infiltrations will greatly increase the difficulty, time, and resource requirements for conducting attacks outside of their haven. If successful, this strategy will potentially cause AQIM to wither on the vine through isolating it from resources.

Based upon the conclusions drawn from the analysis of AQIM's operational network, and its ongoing penetration into the social fabric of northern Mali and other safe havens, a combination of kinetic and non-kinetic tactics to the AQIM threat with a regional approach to fostering security is the most appropriate

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<sup>92</sup> Government of Canada, Canadian Security Intelligence Service. "Terrorism in North Africa and the Sahel—The expansion of a regional threat?" Government of Canada, Canadian Security Intelligence Service. December 19, 2016. Accessed December 01, 2017. <https://www.csis-scrs.gc.ca/pblctns/wrldwtch/2016/2016-12-19/20161219-en.php>.

strategy. Rather than uproot AQIM's influence from northern Mali, the French intervention deepened the connections between AQIM and its affiliates with the local populations by providing security and justice for the minority groups in the region.<sup>93</sup> A sustained government effort to extend security as well as development to at-risk regions will extend government control to previously under-governed regions as well as provide valuable niche governance roles that AQIM and its affiliates filled. The common element tying kinetic and non-kinetic strategies together in this scenario is the close collaboration between the affected governments in the region. The trans-national nature of AQIM and the ability of its affiliates to operate in several countries across the region necessitates a common framework to contain and degrade the network's freedom of movement, recruitment, and logistical activities. Cooperation from local—rather than international—actors is critical to building long term trust among security forces and facilitating the exchange of information about the network.<sup>94</sup>

Any solely kinetic strategy, regardless of the duration or intensity, is unlikely to effectively suppress AQIM at this point in time due to its integration into local minority populations and its sheer geographic distribution across the region. Likewise, a non-kinetic strategy that lacks the ability to pursue and destroy AQIM elements within its safe haven is unlikely to uproot the network from the operational area. Western forces in the region have a role to play in facilitating cooperation and providing training, equipment, whole-of-government support, and ISR, but the limited number of Western forces committed to the region will likely not have a significant influence in degrading AQIM in the long term.

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93 Ibid.

94 Olivier Walther and Christian Leuprecht. "Mapping and Deterring Violent Extremist Networks in North-West Africa." *SSRN Electronic Journal*, 2015. doi:10.2139/ssrn.2593020.

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## VII. CONCLUSION

While AQIM's efforts to overthrow the government of Algeria have virtually ceased, the organization has seized upon a new strategy for expanding into the ungoverned spaces of West Africa, and a deliberate effort to embrace and incorporate non-Arab groups in the region. While the environmental factors within the Sahel have contributed to AQIM's survival, its organizational evolution and adaptation to the new environment have greatly contributed to its resurgence as a viable terror network. Ironically, the counterinsurgency successes of the Algerian security forces during the Algerian civil war precipitated the migration of AQIM into the Sahel, and the subsequent counterterrorism operations of the French military have furthered the spread of AQIM and its affiliate organizations deeper into the weak and unstable Sahelian states.

Despite the sustained pressure from Western and local security forces, AQIM continues to expand its operational reach into new areas. The data demonstrates that the shock of the 2013 French intervention in Mali temporarily disrupted the network and decreased its ability to conduct operations. However, the network demonstrated that it was resilient by replacing lost actors, establishing new connections between organizations, and rebuilding the operational networks required to conduct spectacular terror attacks across the region. No longer confined only to Algeria, AQIM has spread across Niger and Mali, and has demonstrated the ability to conduct attacks in Burkina Faso, Cote D'Ivoire and Mauritania and is increasingly willing to attack and challenge western counterterrorism forces in the region.

This research has explored how AQIM embeds within target populations to overcome setbacks brought on by consistent counter-terrorism efforts from the international community. Based upon the network analysis and current trends, this work recommends a mixed kinetic and non-kinetic approach to containing the AQIM network, and isolating it from the vulnerable populations in the Sahel. The unique environmental, social, and organizational aspects of the AQIM

network should be integrated into the development of a regional strategy of partner nations and western states in order to effectively contain the growth of AQIM in the future.



## APPENDIX. PROJECT CODEBOOK

### A. CODE BOOK FOR AL-QAEDA IN THE ISLAMIC MAGHREB NETWORK

Note: This data was drawn primarily from open source reports in both regional and international news sources.

1. **One-Mode Data Sets** (unless otherwise specified, all One-Mode matrices are 50x50)
  - a. **Organizational Affiliation:** A terrorist organization is defined as an administrative and functional system, whose primary common goal is the operational conduct of terrorist/insurgent activities, consisting of willingly affiliated claimant members. For the purpose of this research, factions and offshoots will be considered separate from their parent organization in order to prevent from coding redundant ties. This network was originally a two-mode data set that was transformed into a one-mode data set using UCINET.
  - b. **Operational Network 2012:** Operational relations are defined as ties between actors if they participated in a joint political or military event, whatever the duration or location of the encounter. Additionally, operational ties exist between actors that jointly participated in negotiations, attacks, bombings, or public pronouncements. Due to the limited data available on the network, this does not encompass financing, co-location events, or logistics.
  - c. **Operational Network 2017:** The definition is the same as Operational Network 2017.
  - d. **Kinship:** Kinship is defined as any family connection such as brother, brother-in-law, nephew etc. Kinship will also include current marriages and past marriages due to divorces and/or deaths. Kinship for the purposes of this research also include close tribal ties.
  - e. **Ethnicity:** A social group defined by its shared and distinct culture, religion, and language. This network was originally a two-mode

data set that was transformed into a one-mode data set using UCINET.

- f. **Nationality:** A social group defined by allegiance or birth within specific political and geographical boundaries. This network was originally a two-mode data set that was transformed into a one-mode data set using UCINET.
- g. **Tribe:** A social group defined by ties to a closely-knit common community, often limited by geography. This network was originally a two-mode data set that was transformed into a one-mode data set using UCINET.

## 2. Two-Mode Data Sets

- a. **Organizational Affiliation 2012:** Matrix identifies to which group each of the actors is actively a member of during the time frame. (50x18 matrix)
  - b. **Organizational Affiliation 2017:** Matrix identifies to which group each of the actors is actively a member of during the time frame. (50x18 matrix)
  - c. **Ethnicity:** Matrix identifies to which ethnic group each actor is a member. (50x5 matrix)
  - d. **Nationality:** Matrix identifies the nationality of each actor within the network. (50x7 matrix)
  - e. **Tribe:** Matrix identifies the tribal affiliation of each actor within the network. (50x4 matrix)
3. **Attribute Data:** Attribute data was collected for all actors within the network, and separated into two matrices, one for the network in 2012, and the second for the network in 2017. While much of the data does not differ between the two matrices, organizational affiliation, status, and prior group affiliation is significantly different for a portion of the actors. (50x9 matrices).

### a. Ethnicity:

List of Ethnicity Groups:

1. Arab
2. Tuareg
3. Fulani / Peul
4. Sahrawi

5. Unknown

- b. **Nationality:** Defined as country of birth, citizenship, or residence.

List of Nationality Groups:

1. Burkina Faso
2. Mali
3. Mauritania
4. Algeria
5. Niger
6. Morocco
7. Unknown

- c. **Tribe:**

List of Tribal Groups:

1. Unknown
2. Ifogha
3. Tilemsi
4. Abaradjou

- d. **Role:** Defined as the role an individual assumes in the terrorist/insurgent network.

List of Roles:

1. Leader
2. Deputy
3. Judge
4. Spokesman
5. Financier
6. Recruiter
7. Unknown

- e. **Organizational Affiliation:** Defined as the primary group affiliation of each member of the network.

List of Terrorist/Insurgent Organizations:

1. Ansar Dine
2. Those Who Sign With Blood
3. Al Qaeda in the Islamic Maghreb (AQIM)
4. Movement for Oneness and Jihad in West Africa (MUJAO)
5. Group to Support Islam and Muslims (JNIM)

6. Ansar Dine Sud
7. Islamic State
8. Macina Liberation Front (MLF)
9. Al Murabitoun
10. Islamic Movement of Azawad (MIA)
11. National Movement for the Liberation of Azawad (HCUA)
12. Group for Salafist Preaching and Combat (GSPC)
13. Islamic Armed Group (GIA)
14. Ansaroul Islam
15. Not Active
16. Malian Army
17. Popular Movement of Azawad
18. Popular Movement for the Liberation of the Azawad

d. **Status:** Defined as the physical condition of the terrorist/insurgent

Status Codes:

1. Alive/Free
  2. Imprisoned
  3. Deceased
  4. Demobilized
  5. Unknown
- 
- f. Prior Organizational Affiliation (most recent)
  - g. Prior Organizational Affiliation (recent)
  - h. Prior Organizational Affiliation (oldest)

## B. ACLED EVENT DEFINITIONS<sup>96</sup>

Event Type	Description
Battle-No change of territory	A battle <sup>97</sup> between two violent armed groups where control of the contested location does not change. This is the correct event type if the government controls an area, fights with rebels and wins; if rebels control a location and maintain control after fighting with government forces; or if two militia groups are fighting. These battles are the most common activity and take place across a range of actors.
Battle-Non-state actor overtakes territory	A battle where non-state actors win control of location. If, after fighting with another force, a non-state group acquires control, or if two non-state groups fight and the group that did not begin with control acquires it, this is the correct code. There are few cases where opposition groups other than rebels acquire territory.
Battle-Government regains territory	A battle in which the government regains control of a location. This event type is used solely for government reacquisition of control. A small number of events of this type include militias operating on behalf of the government to regain territory outside of areas of a government's direct control.
Violence against civilians	Violence against civilians occurs when any armed/violent group attacks civilians. By definition, civilians are unarmed and not engaged in political violence. Rebels, governments, militias, rioters can all commit violence against civilians.
Remote violence	Remote violence refers to events in which the tool for engaging in conflict did not require the physical presence of the perpetrator. Remote violence notes that the main characteristic of an event is that a spatially removed group determines the time, place and victims of the attack. These include bombings, IED attacks, mortar and missile attacks.

<sup>96</sup> Raleigh, Linke, Hegre, and Karlsen. "Armed Conflict Location and Event Data."

<sup>97</sup> ACLED defines a battle as "a violent interaction between two politically organized armed groups at a particular time and location. Typically, these interactions occur between government forces and non-state groups within the context of a civil war. These interactions also apply to militias and violence between different rebel groups, as well as violence between different military forces. This includes militia violence, rebel on rebel violence and military on military violence. There is no causality minimum necessary for inclusion."

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