Regionally Aligned Forces and Megacities

A Monograph

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Abstract

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Regionally Aligned Forces, while providing useful tactical capabilities like cultural and language familiarity, are inadequate for developing comprehensive information about megacity environments. Further, when megacities are considered as complex, adaptive systems, the limitations of comprehensive knowledge reveal themselves. Emergent events that have significant impact on the operational environment are plain only in hindsight, causally linked to the interactions between interdependent agents and populations in the city. Though RAF are not the primary solution to understanding megacities, they do represent the mindset of human engagement that will be required to discern the relationships between key actors in the environment. Gaps in professional knowledge of megacity environments could be addressed through officer education and fellowship programs, while tactical issues and technological development can be resolved in existing or accessible training sites. The method used is controlled comparison of three different developing megacity environments: Lagos, Karachi, and Cairo. These three environments readily demonstrate the complexity, scale, and depth of megacity environments and the challenges inherent in addressing them with Regionally Aligned Forces.

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Acronyms

AFRICOM	Africa Command
AOR	Area of Responsibility
ARFORGEN	Army Force Generation
CENTCOM	Central Command
CSASSG	Chief of Staff of the Army Strategic Studies Group
DOD	Department of Defense
DSG	Defense Strategic Guidance
GDP	Gross Domestic Product
LGA	Local Government Areas
PACOM	Pacific Command
RAF	Regionally Aligned Forces
SFA	Security Force Assistance
UN	United Nations
US	United States

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INTRODUCTION

"Attack cities only when there is no alternative."
— Sun-Tzu, *The Art of War*

The preceding quotation by Sun-Tzu is widely perceived by military practitioners as the type of boilerplate military wisdom that transcends eras of conflict. Despite the widely read and quoted advice of an ancient Chinese general, military forces continue to engage in combat within urban environments. The proverbial wisdom of Sun-Tzu is not necessarily wrong; it was simply a strategy shaped towards winning battles during the Warring States period of ancient China. The army of Sun-Tzu was engaged in existential conflict. Destruction of his army under any circumstance meant more than defeat on the battlefield; it would lead to the destruction of the state, and eventual subjugation and assimilation at the hands of others. In this context, no city was worth fighting for if an urban battle put the army, and by consequence the nation, at risk. In the next era of warfare, the stakes may be equivalent, but avoiding cities will likely not be an option. The world is in the midst of a transformation, and for the first time more people live in cities than live outside of them.[1] Success in future conflict will require more than the open maneuver warfare the US Army prefers, as "wars happen where people live, and people will be overwhelmingly concentrated in coastal cities."[2]

The consequences of globalization, industrialization, and urban migration have resulted in a relatively new phenomenon. Today, there are twenty-eight *megacities* globally - cities with a population in excess of ten million. Five more cities are currently on the cusp of breaking this

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[1] United Nations, Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2014 Revision*, 2014, 2, 7.

[2] David Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerrilla* (Oxford; New York, NY: Oxford University Press, 2013), 239.

arbitrary population metric.[3] Megacities present several problems for the Army besides their

sizeable populations. Two key traits that define the megacity environment are the scale of the

environment and the density of the population therein. Scale in this case refers to the large

geographic area of continuous urban landscape. The density of the population is the number of

people living in a limited space, and the pressure that density exerts on the city as a whole as the

population grows. In layman's terms, a megacity is "nothing more than a large city"[4] where the

cultures, religions, economies, and politics of the people who live there defines the individual

character of the environment.

Current Army doctrine recognizes world urbanization trends and the importance of cities,

providing a number of reasons for conducting decisive action within them.[5] Enemy forces may

choose to withdraw into the urban environment to mitigate Army and Joint Force advantages in

firepower and maneuver. Aspects of the city in question may have operational or strategic value.

The city may be of symbolic importance. Finally, the geographical location of the city may

dominate a region or avenue of approach. The concentration of human capital, commerce,

industry and governance in megacities serves to increase their importance.[6]

Despite acknowledging the importance that urban centers represent, doctrine is

inadequate in several ways concerning megacities. *FM 3-06 Urban Operations* repeatedly

emphasizes that physical isolation of enemy forces is a key tenet of successful urban operations,

in a historic and contemporary sense.[7] The scale of the megacity will make physical or virtual

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[3] United Nations, *World Urbanization Prospects,* 1.

[4] Benjamin Hennig, "Megacities on the Map," *Views of the World Blog,* June 07, 2011, accessed February 6, 2015, http://www.viewsoftheworld.net/?p=1590/.

[5] Field Manual (FM) 3-06, *Urban Operations* (Washington, DC: Headquarters, Department of the Army, 2006), 1-7.

[6] Chief of Staff of the Army Strategic Studies Group, *Megacities and the United States Army: Preparing For a Complex and Uncertain Future* (Washington, DC: Headquarters, Department of the Army, 2014), 4.

[7] FM 3-06, 7-20, 7-54.

isolation of dispersed enemy forces impossible. Additionally, doctrine presents an argument that cities are complex "systems of systems."[8] While acknowledging the complex environment and providing a basic model for understanding key aspects of the urban area of operations, *FM 3-06 Urban Operations* does not articulate a methodology for translating this complexity to successful planning, instead focusing on conducting traditional forms of maneuver in a more complex environment.[9] Most importantly, doctrine represents engaging in urban combat as a carefully evaluated choice, devoting an entire chapter of *FM 3-06 Urban Operations* to weighing the risks and benefits to the operational plan.[10] In summary, current doctrine has not seriously considered the implications of conducting military operations in megacity (termed *megalopolis* in *FM 3-06*) environments.

The Defense Strategic Guidance (DSG) of 2012 identified eleven primary missions for the Joint Force. The DSG was oriented on complex threats while rebalancing the military towards the Asia-Pacific region. In translating this guidance, the Army joined with the US Marine Corps and Special Operations Command to develop a concept called Strategic Landpower. Strategic Landpower "is the combination of land, human, and cyber activities that make decisive outcomes more likely, and increases options for preventing and containing conflict."[11] The crux of this strategy is in the "human dimension," focused on developing our Soldiers, leaders, and international partners to shape, prevent, and win on the battlefield of the future.[12] The first

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[8] FM 3-06, 1-3.

[9] Chief of Staff of the Army Strategic Studies Group, *Megacities and the United States Army,* 8.

[10] FM 3-06, 5-1.

[11] Headquarters, Department of the Army, *Army Strategic Planning Guidance,* 2013, 6.

[12] Training and Doctrine Command defines the Human Dimension in TP 523-3-7 as "the cognitive, physical, and social components of Soldier, Army Civilians, leader, and organizational development and performance essential to raise, prepare, and employ the Army in unified land operations."

operational outcome of this strategy was the concept of Regionally Aligned Forces (RAF).[13]

The RAF concept is tactical in nature, but has strategic implications. RAF emphasizes the mentorship and training of partner security forces to deter future conflict. Army Chief of Staff Odierno describes RAF as "Army units and leaders…who focus on a specific region within their normal training program by receiving cultural training and language familiarization."[14] For geographic combatant commanders, RAF provides a pool of units familiar with languages, cultures, and the armed forces within their areas of responsibility. The intent is to enable more productive security cooperation engagements with host nations, with the goal of preventing future conflict. RAF establishes the Chief of Staffs vision of the army as a "globally responsive, regionally engaged force."[15]

Though the expertise necessary to operate in a given megacity may not currently exist, RAF units may present an opportunity to develop our appreciation and understanding of megacity environments as an Army. Megacities, while currently a topic of emphasis and study, are not clearly understood as an operational environment.[16] If global trends in urbanization continue, the likelihood of a megacity or a large urban area becoming an environment in which the US Army must operate increases as well. This study will seek to determine whether the current Regional Alignment of Forces construct can effectively develop the regional expertise needed to achieve strategic objectives in a megacity.

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[13] Kimberly Field, James Learmont, and Jason Charland, "Regionally Aligned Forces: Business Not as Usual," *Parameters* 43, no. 3 (Autumn, 2013): 55-63, accessed December 14, 2014, http://search.proquest.com/docview/1462044522?accountid=28992.

[14] Ray Odierno, "Regionally Aligned Forces: A New Model For Building Partnerships," *Army Live Blog*, March 22, 2012, accessed February 7, 2015, http://armylive.dodlive.mil/index.php/2012/03/aligned-forces/.

[15] Michelle Tan, "First Regionally Aligned BCT Shares Lessons Learned, *Army Times,* September 16, 2013, accessed February 4, 2015, http://archive.armytimes.com/article/20130916/NEWS08/309160009/First-regionally-aligned-BCT-shares-lessons-learned.

[16] Chief of Staff of the Army Strategic Studies Group, *Megacities and the United States Army,* 1.

Hypothesis

The RAF construct will not result in comprehensive understanding of megacity environments necessary for development of effective operational approaches, for several reasons. First, the intent behind the RAF concept does not effectively scale to megacity environments. Additionally, megacities are complex, adaptive systems whose scale, breadth, and depth exceed the capabilities of RAF units to maintain visibility and understanding. Additionally, RAF training as currently implemented does not facilitate the in-depth understanding required for complex urban environments. Finally, tactical units perceive problems and solutions through the lens of doctrine, and current doctrine is inadequate to the megacity problem. While the RAF construct may provide useful tactical capabilities in the megacity environment, tactical capabilities alone do not translate into operational approaches that solve strategic problems.

Methodology

To understand the unique environment that megacities represent it is necessary to appreciate the global trends that are driving migration to large cities. Appreciating these trends then leads to examining governmental and security challenges in megacity environments and identifying sources of instability. Following this review it will then become clear why megacities are important to military forces, leading to an examination of the megacity as an operational environment, and how that environment will amplify the historical challenges combatants face when fighting in the urban space. Complexity Science is the basis for most megacity models. A review of several concepts from complexity science will establish much of the basis for further discussion of megacity models in academia and military theory. Following theoretical review, three case studies of developing megacities in Nigeria, Pakistan, and Egypt will provide detailed environmental descriptions. Finally, I will present my arguments in three sections before presenting conclusions and implications of the research conducted.

LITERATURE REVIEW

Urbanization is a long-term global trend that will accelerate in the future.[17] In 2007, the number of people living in cities outnumbered those living in rural areas for the first time in human history.[18] Worldwide demographic trends suggest that rural populations will remain relatively stable over the next thirty years even as the world population grows by two and a half billion, the vast majority of whom will be in Asia and Africa. The majority of this increasing population will live in large cities (including megacities), with populations in excess of five hundred thousand.[19] The United Nations predicts that by 2030 there will be forty-one megacities worldwide.[20]

Megacities share several properties, even as each one is unique in demographics, geography, culture, governance, and economy. Most megacities reside in littoral zones, and dominate their regions. They are economically critical, serving as manufacturing, transportation, shipping, and commerce hubs. Most suffer from severe automobile traffic congestion. In developing countries, substantial numbers of megacity denizens reside in slums with minimal utilities and no access to running water.[21] Megacities are culturally significant, possessing landmarks, artifacts, and organizations deeply tied to the historical and cultural identity of populations. Finally, megacities are politically critical, with many serving as seats of government within nation-states.

Massive as they are, megacities only contain approximately fifteen percent of the world's urban population, a percentage projected to be relatively consistent over the next twenty-five

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[17] United Nations, *World Urbanization Prospects: The 2014 Revision*, 7.

[18] Ibid., 2.

[19] Ibid., 1.

[20] Ibid., 2.

[21] Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerrilla*, 39.

years.[22] Including megacities, half of the global urban population lives in cities exceeding five hundred thousand residents. The other half of the world's urban denizens live in cities of approximately five hundred thousand in population or less. Projected population growth is much more significant in developing countries in Asia, the Middle East, Central and South America, and Africa. Conversely many modernized Asian, European, and American cities have experienced population declines since 2000, the primary reasons being low birth rates and emigration.[23] The primary factors influencing emigration from cities in these regions are economic contraction and natural disasters.[24] Despite the current emphasis towards megacity environments in military circles, the vast majority of urban dwellers in the future will in fact be located in something less than a megacity.
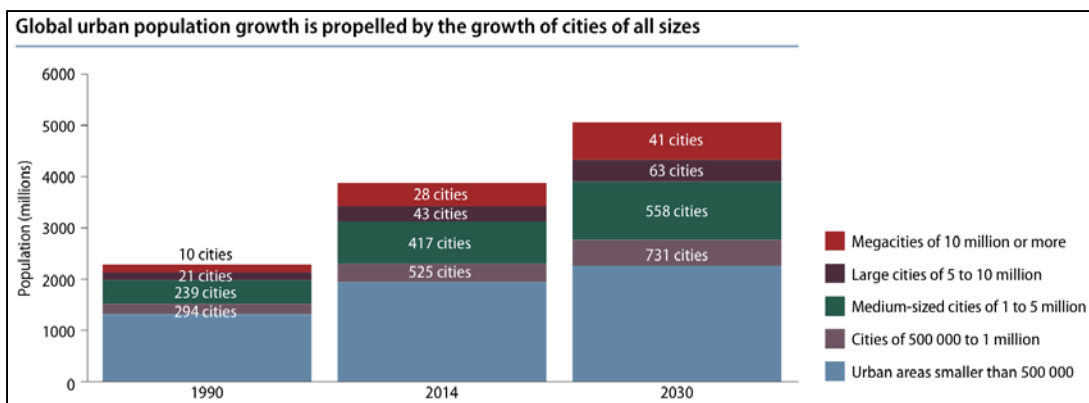
Figure 1. Global Population Growth

Source: United Nations, Department of Economic and Social Affairs, Population Division. *World Urbanization Prospects: The 2014 Revision*, 2014, 13.

Globalization has a significant influence on urbanization. Globalism is "the development of an increasingly integrated global economy marked especially by free trade, free flow of capital, and the tapping of cheaper foreign labor markets."[25] The consequences of globalization, however,

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[22] United Nations, *World Urbanization Prospects: The 2014 Revision*, 2.

[23] Ibid., 15.

[24] Ibid., 15.

[25] *Merriam-Webster Dictionary*, s.v. "Globalization," accessed 14 December, 2014,

produce effects far beyond the economic. Journalist Thomas Friedman provides a more appropriate view, defining globalization as the "inexorable integration of markets, nation-states, and technologies…in a way that is enabling individuals, corporations and nation-states to reach around the world farther, faster, deeper, and cheaper than ever before."[26] The phenomenon of globalization has had tremendous effects on human populations, creating "its own demographic pattern – a rapid acceleration of the movement of people from rural areas and agricultural lifestyles to urban areas and lifestyles."[27] This urbanization trend, and demographic patterns linked to globalization, are primary factors contributing to the growth of megacities worldwide.

A number of global trends related to globalization are driving megacity development. In *Out of the Mountains* military theorist David Kilcullen asserts that four global megatrends (population growth, connectedness, urbanization, and littorilization) are shaping the future environment.[28] Population growth is self-explanatory. Connectedness refers to the increased association between people in communications, transportation, and commerce. Urbanization is the movement of people to cities, while littorilization is the propensity of these cities to develop near coastlines, primarily for economic reasons.[29] Rapid population growth worldwide, primarily in low-income countries, is combining with rural migration to create explosive growth in many megacities.

The dominant narrative of developing megacities focus on the poorest communities, portraying them "…as calamities-vast, open sewers that fuel a vicious cycle of poverty, increase income and health disparities, and degrade the environment."[30] Several positive factors influence

http://www.merriam-webster.com/dictionary/globalization.

[26] Thomas L. Friedman, *The Lexus and the Olive Tree*, Rev. ed. (New York: Farrar, Straus, Giroux, 2000), 9.

[27] Ibid.

[28] Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerrilla*, 25.

[29] Ibid., 28.

[30] Jonathan Kalan, "Think Again: Megacities," *Foreign Policy*, no. 206 (May, 2014): 69,

rural migration to cities despite the perception that slums are drivers of instability. The 2014

United Nations report on world urbanization argued "…urban living is often associated with

higher levels of literacy and education, better health, greater access to social services, and

enhanced opportunities."[31] In essence, rural populations are migrating to coastal cities because

they offer the possibility of an improved quality of life and economic opportunity that may be

absent in the rural village. In this context, the slums that frequently exhibit the highest population

density within a megacity serve as the gateways that allow access to the city.

Despite the generally pessimistic tone of prevailing megacity narratives, opportunities

will exist for the Army and host nation governments to harness the populations to positive effect.

The slums and poorest communities are critical for overall health and functioning of the

megacity, as they provide the workforce that services the city's systems, and are the connective

tissue between rural populations, the city, and diaspora populations.[32] The poorest communities

also serve as the human connection between rural populations and city centers, and a means for

rural populations to connect with global networks.[33] Robert Kaplan points out that "Ideas do

matter… and it is the very compression of geography that will provide optimal circumstances for

new and dangerous ideologies – as well as for healthy democratizing ideas."[34]

As clear as the overall global trends are, growth is constrained to specific geographic

regions. Large cities that have experienced population stability or declines are exclusively in what

the UN terms "high-income" countries, such as the United States, France, Japan, South Korea,

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73, 12, http://search.proquest.com/docview/1523727248?accountid=28992.

[31] United Nations, *World Urbanization Prospects: The 2014 Revision*, 3.

[32] David Kilcullen, "The City as a System: Future Conflict and Urban Resilience," *Global Trends 2030*, July 18, 2014, 25, accessed December 7, 2014, http://gt2030.com/2012/07/18/the-city-as-a-system-future-conflict-and-urban-resilience/.

[33] Ibid.

[34] Robert D. Kaplan, *The Revenge of Geography: What the Map Tells Us about Coming Conflicts and the Battle against Fate*, 1st ed. (New York: Random House, 2012), 123.

and Russia.[35] The population of many megacities and large cities in Europe, South Korea, and

Japan are currently shrinking, the primary variable being low birth rates.[36] In contrast, urban

populations are rapidly increasing in low and middle-income developing countries such as

Pakistan, Egypt, India, Bangladesh, China, and Nigeria. Governments lacking the resources to

compensate for explosive urban population growth face significant challenges in providing basic

services, access to adequate health care and economic opportunity. This means "the dynamics of

urbanization are very different in the different regions, and even the processes within the hotspot

of megacities, the Asian continent, are very different due to the different economic and political

conditions there."[37] Individual megacity environments are dissimilar from each other; operating

in a mature city with planned, gradual development will be starkly different from an explosive

growth environment.

There are several reasons for the Army to be interested in global urbanization and

megacity environments. Appreciating the dynamics at play within individual megacities will be

fundamental to avoiding strategic surprise requiring unplanned intervention.[38] Many emergent

megacities are in developing countries and prone to instability that could have repercussions on

American interests. Large cities require tremendous resources to maintain populations, and

environments in which a key resource, such as water, is constrained may have "…explosive side

effects on politics."[39] The proximity of megacities to littoral zones worldwide means many of

them are severely vulnerable to natural disasters. Megacities concentrate economy, media, and

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[35] United Nations, *World Urbanization Prospects: The 2014 Revision*, 15.

[36] Ibid., 4.

[37] Benjamin Hennig, "Megacities on the Map," *Views of the World Blog.*

[38] Chief of Staff of the Army Strategic Studies Group, *Megacities and the United States Army*, 10.

[39] Robert D. Kaplan, *The Revenge of Geography: What the Map Tells Us about Coming Conflicts and the Battle against Fate*, 1st ed. (New York: Random House, 2012), 120.

governance, lending gravity to events that take place there.[40] In developing countries, megacities continue to accrue significant risk factors that could lead to conflict, including economic disparity, high unemployment, resource scarcity, and dangerous ideological proliferation to alienated populations.[41] The density of megacity environments increases the risk of pandemic events, especially in slums that allow the rapid transmission of water borne disease. Finally, megacities can serve as staging bases for attacks elsewhere, through their access to shipping and commerce or more overtly as cover and concealment for long-range weaponry. Deterring future conflict will require identification and prioritization of at-risk cities and the capability to influence them before events spiral out of control.

Challenges to effective governance magnify in developing countries, where available financial resources are limited. Further, it is difficult for outsiders to discern the actual governmental, power, and social structures that drive the city. The ability of governments to provide basic utilities, police, emergency response, schools, maintenance, trash collection, etc. are overwhelmed in places like Mumbai, Dhaka, and Mexico City.[42] Lack of government presence in the slum areas of cities like these creates a breeding ground for criminal networks, insurgents, and gangs, nested within disaffected populations. In a significant terror attack conducted in Mumbai in 2008, access to the city center occurred through the coastal slums, where no security or government presence existed.[43] Even in well-organized cities, the roles and integration of

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[40] Chief of Staff of the Army Strategic Studies Group, *Megacities and the United States Army*, 3.

[41] Kilcullen, David. "The City as a System: Future Conflict and Urban Resilience," 21-25.

[42] Ibid., 39.

[43] Barney Henderson and Amrita Kadam, "Mumbai 26/11," *The Telegraph*, November 26, 2013, accessed December 1, 2014, http://www.telegraph.co.uk/news/worldnews/asia/india/10474304/Mumbai-2611-five-years-on-city-still-feels-scars-of-devastating-terrorist-attack.html.

government services differs. The structures of governance may be well integrated and capable, marginally capable, or completely inadequate. Illicit networks can influence governance in any of these cases. Understanding how a city is managed, relationships that exist between power brokers, and how business is typically conducted will be critical to operating effectively.

The majority of megacities are geographically positioned in or near coastal littorals. Many of them are vulnerable to natural disasters and resource scarcity. Dhaka, Mumbai, and Manila are all examples of megacities that have experienced significant flooding in the last decade. Los Angeles and Mexico City are both situated near fault lines and have historically suffered devastating earthquakes. Megacities in developing countries in particular suffer from resource scarcity, primarily food and water. In megacities of the Middle East, Asia, and Africa, the unmanageable growth of the slums results in ramshackle settlements expanding into catchment areas providing water for the city. These unmanaged settlements serve as a double-edged sword, contaminating and removing water supplies even as they increase water requirements.[44] In the Middle East, the explosive population growth and lack of water has the potential to bring nations into conflict.[45] It will be important to understand where megacities are vulnerable and whether they are capable of responding effectively to adverse events when they occur.

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[44] Kadam Henderson, "Mumbai 26/11," *The Telegraph*.

[45] Kaplan, *The Revenge of Geography: What the Map Tells Us about Coming Conflicts and the Battle against Fate*, 120.

Figure 2. The slums of Lagos, Nigeria.

Source: Chief of Staff of the Army Strategic Studies Group, *Megacities and the United States Army: Preparing For a Complex and Uncertain Future* (Washington, DC: Headquarters, Department of the Army, 2014).

THE MEGACITY AS AN OPERATIONAL ENVIRONMENT

This section briefly describes the broad characteristics of megacity environments and how they may affect military operations. Urban environments have traditionally challenged military forces, and these challenges amplify in the megacity. The density of urban structures, populace, and signal proliferation will mitigate Intelligence, Surveillance, and Reconnaissance (ISR) platforms, US advantages in firepower and range, and interfere with force mobility. Megacities have divergent physical and governmental structures, with unique political processes that are opaque to the outsider and even to many of the locals.[46] The civilian population of individual cities may be relatively homogenous in culture, or diverse. The dense environment of large cities allows for the proliferation of illicit networks, criminal activity, and gangs. Many of

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[46] Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerrilla*, 243.

these networks connect with political leadership, have worldwide reach through diaspora populations and control entrenched smuggling networks connecting them to other nations and cities.[47]

ISR assets have provided the US military significant advantages during the last decade of war. Persistent, real time video feeds from airborne platforms have greatly assisted commanders in understanding battlefield geometry and targeting enemy forces. It is in the rural, mountainous environments similar to those in Afghanistan or the rural areas of Iraq this advantage is most pronounced. Dense, urban environments curtail these capabilities for a number of reasons. The vast number of people occupying a relatively small area is one complicating factor. The megacity offers a vast array of cover from overhead surveillance. Current ISR assets do not see into buildings. Most megacities have significant subterranean structures that can offer egress to individuals or groups. Sympathetic civilians can easily hide insurgent forces, a recurring challenge complicated by the density of people and dwellings in a megacity. Signal intelligence platforms must cope with an ever-increasing volume of signal noise, increasing the difficulty in collecting and sorting various forms of signal intelligence. Even in slum communities, cellphone use is prolific while roofs covered with satellite dishes and radio antennae ensure access to information.[48] Finally, standard ground-level platforms, from low-tech binoculars to state of the art vehicle platforms, will be severely limited by obstacles to line of sight. In summary, sensor observation will be limited in all domains within the megacity.

Firepower and range have been distinctive historical advantages for US forces. During Operation Desert Storm, American tanks had twice the effective range of Iraqi tanks, a marked

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[47] Ibid., 93.

[48] Ibid., 33.

advantage that no numerical superiority could overcome.[49] Overwhelming air and indirect fire superiority marks US and NATO combat operations since World War II, providing significant advantages in combined arms. The megacity will mitigate each of these capabilities a number of ways in the majority of circumstances. The density of population and proximity of non-combatants to military targets will inhibit air and indirect fire capabilities. The desire to prevent collateral damage of key infrastructure or urban housing with dense populations is another consideration. Finally, the availability of ample cover and concealment will make target acquisition difficult when facing skilled adversaries. Urban environments traditionally force combatants to fight at close range, providing maximum advantage to the defender.[50]

Megacity environments significantly curtail mobility and maneuver. Most megacities have significant civilian traffic that will close or constrain routes for maneuver forces. In developing countries unplanned settlements of migrants and the poor, usually on the perimeter of the city, may not have routes suitable for vehicle travel. Lagos, for example, has many slums that are actually afloat; walking from structure to structure or using small boats is the only method of access.[51] The speed of communication in the large city, whether word-of-mouth or using modern communications technologies, will provide the early warning necessary to allow combatants to escape or to restrict access to areas with barricades and roadblocks, a situation US forces faced when conducting a raid in Mogadishu in 1993.[52] In general, the structures of the megacity restrict

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[49] Richard W. Stewart and Center of Military History, eds., *American Military History*, 2nd ed., Army historical series (Washington, D.C: Center of Military History, United States Army, U.S. G.P.O, 2009), 418.

[50] Louis A. DiMarco, *Concrete Hell: Urban Warfare from Stalingrad to Iraq* (Oxford ; Long Island City, NY: Osprey, 2012), 19.

[51] Josh Eells, "A Wild Week in Lagos," *Men's Journal*, May, 2012, accessed 2 December, 2014, http://www.mensjournal.com/magazine/print-view/chaosopolis-20120504.

[52] Mark Bowden, *Black Hawk down: A Story of Modern War*, 1st ed. (New York: Atlantic Monthly Press, 1999), 125.

maneuver. Air mobility has the potential to overcome some of these obstacles, but is also restricted by the three dimensional terrain, lack of suitable landing zones, and the standard dangers of flying in the city (power lines, vulnerability to small arms fire, etc.). These factors will determine the responsiveness of Army forces operating in megacities.

SYSTEMS AND COMPLEXITY

This section examines systems and complexity theory, and how they relate to urban environments. Political Scientist Robert Jervis defines a system in his book *System Effects*: "We are dealing with a system when (a) a set of units or elements are inter-connected so that changes in some elements or their relations produce changes in other parts of the system and (b) the entire system exhibits properties and behaviors that are different from those of the parts."[53] In essence, the whole is *different* from the sum of its parts, and actions taken within the system will have unintended consequences. In a complex, adaptive, system we can "never do merely one thing" because any action taken will produce multiple changes, many of them unobserved.[54] Another important aspect of complex systems is the futility of reductionism, defined as "seeking to understand the system by looking only at units and their relations with one another."[55] It is worth noting that most planning processes used in the Army, such as the Military Decision Making Process, take a reductionist approach. Finally, Jervis relates the principle of interconnectedness, where "in a system, the fates of the units and their relations with others are strongly influenced by interactions at other places and at earlier periods of time."[56]

Most proposed models for understanding megacity environment treat the "city as a

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[53] Robert Jervis, *System Effects: Complexity in Political and Social Life* (Princeton, NJ: Princeton University Press, 1997), 6.

[54] Ibid., 10.

[55] Ibid., 13.

[56] Ibid., 17.

system."[57] This perspective is largely distilled from complexity science. Complexity science was preceded by Chaos Theory, which "…tells us that the smallest action can reverberate through a system and produce extraordinary and completely unpredictable results."[58] Complexity science accepts the basic premise of chaos theory, and focuses on analysis of complex systems. A complex system is defined as "…having a large number of independent components (called *agents*) that interact with each other in a myriad of rule-based relationships, and which, through these interactions, display emergent behavior at the level of the system."[59] Interdependence is a primary characteristic of complex systems, when the behavior of one component in a system alters the behavior of others.[60]

Emergent properties, are "the property of the whole, not the property of the parts, and cannot be deduced from the properties of the parts."[61] In layman's terms, *emergence* is merely an unpredictable response or effect, produced by the system, caused by interactions between elements of the system or the introduction of new elements. Emergent events are unpredictable by nature, but may have significant positive or negative impacts on the system. Army doctrine describes emergence as a "surprise-generating mechanism," warning that actions taken based on previous experience could have negative consequences.[62]

Applying these concepts of complexity, adaptability, interdependence, and emergence to the megacity leads to a few insights that apply to military theorists. First, the megacity may

[57] Kilcullen, "The City as a System", 26-28.

[58] Everett C. Dolman, *Pure Strategy: Power and Principle in the Space and Information Age*, Cass series--strategy and history 6 (London ; New York: Frank Cass, 2005), 94

[59] Ibid., 100.

[60] Alex Ryan, *Art of Design*, (Leavenworth, KS: School of Advanced Military Studies, 2011), 26.

[61] Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture*, 3rd ed. (Burlington, MA: Morgan Kaufmann, 2011), 46.

[62] Field Manual Interim 5-2*, Design* (Washington, DC: Headquarters, Department of the Army, 2009), 1-7.

display "…extreme sensitivity or indifference to inputs." This simply means a minor action can have radical impacts, even if prior minor actions in the same vein had no observable effect.[63] Second, though we may not be able to predict what specific actions will cause the city to change, we can recognize patterns of change and understand where the city, as a system, is trying to go.[64] Finally, if we have developed a competent understanding of the city and its myriad agents it is possible to discern what courses of action would be counter-productive.

MEGACITY MODELS

Doctrine is largely the intersection of military theory and history. When viewed through this lens, it becomes clear why doctrine is currently inadequate for the megacity environment- no historical examples exist. However, the conduct of urban operations is nothing new for the US Army. Large cities served as operational environments in several historical campaigns, including: major combat in Manila in 1944, stability operations in Berlin and Tokyo following World War II, major combat in Seoul in 1950, Saigon in 1968, and more recent experiences in Baghdad, including major combat and counter-insurgency phases.[65] It is also fair to say that each of these environments demonstrated complexity.[66] Despite the historical experience operating in urban environments, the scale and density of the megacity have yet to be experienced in any significant way.

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[63] Dolman, *Pure Strategy,* 94.

[64] Ibid.*,* 111.

[65] Sam Fuller, "The US Army and large Cities Prior to the Global War on Terror", monograph (Command and General Staff College, 2013), 13-14.

[66] The notion that current and future operational environments are more complex than previous ones is largely inaccurate. Army campaigns fought in Vietnam, Europe, Korea, Baghdad, and Afghanistan all had unique environments, cultures, rules of engagement, divergent enemy forces, etc. Perceived complexity, however, has increased in the last few years, primarily due to the nebulous nature of strategic guidance, proliferation of technology, and recent conflicts primarily consisting of counter-insurgency operations. See Adam Elkus and Crispin Burke, "Operational Design: Promise and Problems*,*" *Small Wars Journal blog*, 9 Feb 2010, accessed 22 Feb 2015, http://smallwarsjournal.com/blog/journal/.../362-elkus.pdf.

CSASSG: Strategic Appreciation & Typology

The Chief of Staff of the Army Strategic Studies Group (CSASSG) recently completed a research project on megacities, reaching the conclusion that the army was not prepared to operate in the environment, primarily due to the complexity and scale of the environment.[67] The theory underlying the model, based on systems thinking, views the megacity through the lens of complex, adaptive systems.[68] The model for megacities proposed by the CSASSG focuses on strategic appreciation, "meant to provide a framework for organizing the various dynamics in play which may precipitate military intervention in a megacity."[69] In this model, strategic appreciation begins by combining observable characteristics of megacity environments (context, scale, density, connectedness, flow and threats) with drivers of instability and the capacity of the city to handle crisis. This results in a typology (highly integrated, moderately integrated, loosely integrated) that will allow for assessing the strategic risks and challenges specific cities represent (see figure 3, pg. 21).[70]

The shared characteristics of megacity environments in the CSASSG model presented in *Megacities and the United States Army* are context, scale, density, connectedness, flow, and threats (see figure 3, pg. 21). Context is viewing the city "within its own historical, cultural, local, regional, and international context."[71] Scale is the relative size of the environment, while density refers to the concentration of population, infrastructure and signal traffic within the scale of the environment. Connectedness is the interrelation of information, goods and populations to each other within and without the megacity. Flow is "the movement of people, resources and things in

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[67] Chief of Staff of the Army Strategic Studies Group, *Megacities and the United States Army*, 21.

[68] Ibid., 12.

[69] Ibid., 13.

[70] Ibid., 14.

[71] Ibid., 11.

and out of the megacity."[72] Finally, threats are the dynamics of friction that threaten the stability of the environment.

The CSASSG model uses the characteristics of megacities, assessed sources of instability, and estimated capacity of the megacity to generate a value judgment on the likelihood and necessity of US intervention (see figure 4, pg. 19). Factors evaluated as sources of instability in the CSASSG model include population growth and migration, separation (ethnic and/or economic), environmental vulnerability, resource competition, and hostile actors. The model describes capacity in terms of anti-fragility (ability of the city to learn from adversity) and resilience (ability to respond to adverse events).[73] In this model, the key characteristic that creates capacity in megacities is the integration of government, security, economy, and infrastructure. Highly integrated cities in which centralized, formal systems combine with high quality infrastructure and regulated flows are significantly more resilient when responding to crisis.

The primary benefit of the CSASSG model for developing typology of megacities is that it allows for prioritized planning efforts for the Army. In addition, viewing specific megacity environments through systems thinking sets a precedent for how the Army will approach problems there. The simplicity of the model as discussed, however, belies the difficulty in gathering the information necessary for the typology to be predictive. Another factor weighing against the relevance of the model is the changing nature of complex, adaptive systems. No megacity can be expected to remain static before, during, or after analysis is conducted, especially if emergent events influence conditions.
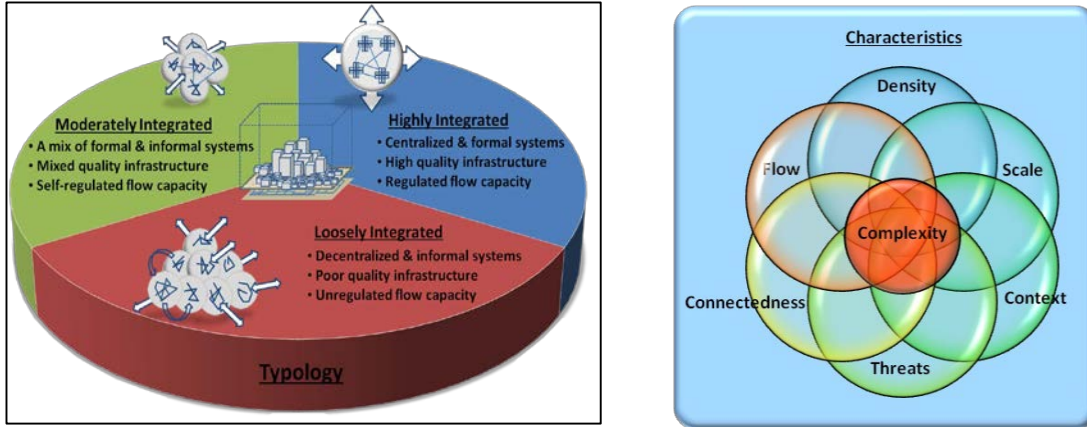
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[72] Ibid.

[73] Ibid., 13.

Figure 3. Typology & Characteristics of Megacity Environments

Source: Chief of Staff of the Army, Strategic Studies Group, 11, 14.
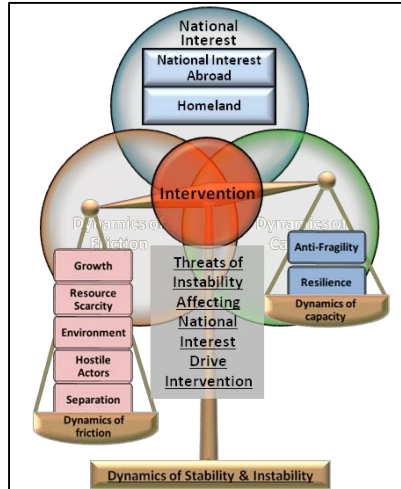
Figure 4. Frictions which exceed the capacity of megacities cause an imbalance. Intervention will occur where and when this imbalance coincides with US national interest.

Source: Chief of Staff of the Army, Strategic Studies Group, 13.

Kilcullen: The City as a System

Kilcullen's *City as a System* model for appreciating cities is a logical extension of his

observations that four megatrends are driving the future environment (population growth,

connectedness, urbanization, littorilization). This model does not isolate the city as a singular

system; rather, it frames the city as a complex, adaptive system "functioning as an exchange

mechanism that connects rural hinterlands with urban populations, and with international

networks."[74] This model largely looks at the megacity as a future conflict environment, is inclusive of likely threats, and is designed around identifying leverage points in the system that can be acted upon to deter conflict and foster resilience in the environment.
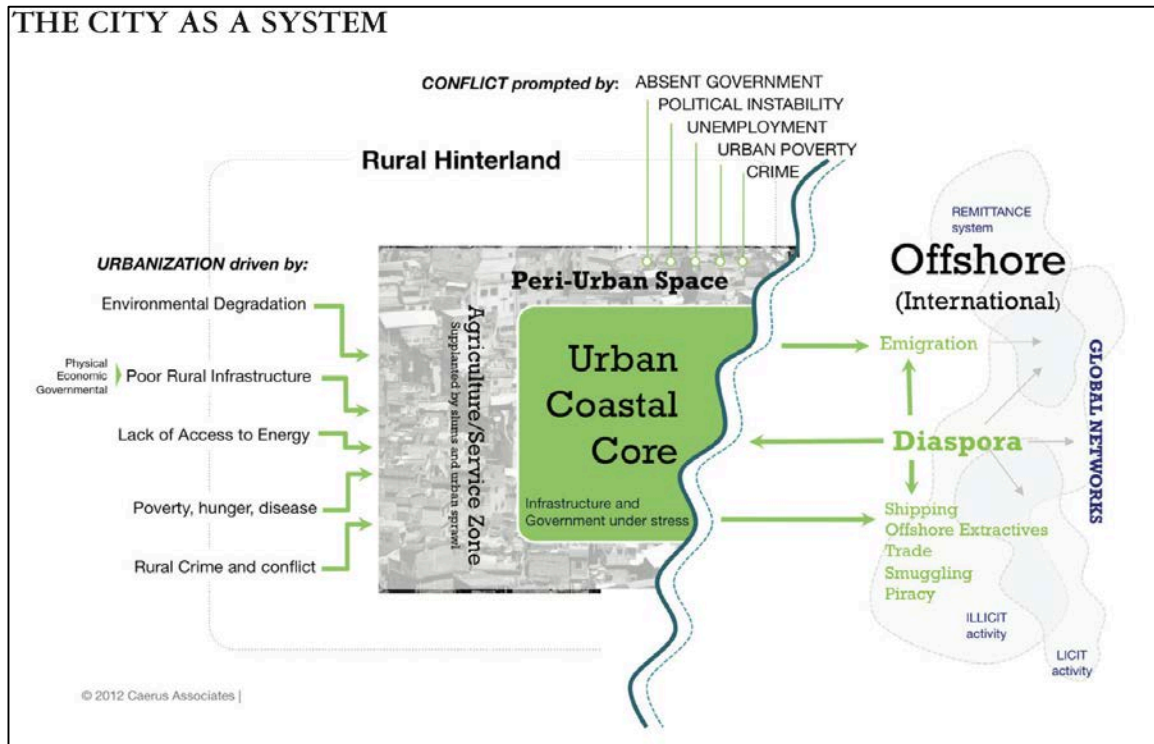
Figure 5. *The City as a System*

Source: David J. Kilcullen, "The City as a System: Future Conflict and Urban Resilience," The Fletcher *Forum of World Affairs* 36, no. 2 (Summer, 2012): 27.

In this model, the city itself is described in general terms as consisting of an urban core surrounded by ad hoc peri-urban settlements.[75] Peri-urban settlements are the destination of migrants from the countryside, fleeing rural conflict, poor infrastructure, or seeking better opportunities. As a result, they place stress on the city infrastructure, creating unstable environments. At the same time, the city's connection to global networks allows access to

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[74] Kilcullen, "The City as a System," 19-39.

[75] Ibid., 28.

diaspora populations as well as licit and illicit activities offshore.[76] Kilcullen proposes that it is in this environment that a series of likely threats will emerge.

The city as a system model proposes that the primary threat in the future environment will be "irregular, hybrid, and nested."[77] Irregular warfare is conflict against non-state armed groups, broadly defined as "combatants who do not belong to the regular armed forces of nation-states."[78] These groups will likely pursue strategies that avoid direct confrontation with superior military forces. Hybrid threats refer to the merger of different threat categories (state and non-state, military and criminal, conventional and asymmetric, local and global) across the spectrum of conflict, enabled by the megacity environment.[79] Nesting in this sense means that illicit networks will exist within licit networks, and local threats are part of regional and global networks.[80]

Understanding the characteristics of the city and the nature of the threat leads to a methodology for identifying how "complex systems that may appear unrelated…interact with each other in the context of a given city or threat network."[81] Kilcullen argues taking this approach will allow for identifying emergent events in the complex, adaptive city and development of tailored interventions. Within the model, tailored interventions take place on the supply side, demand-side, or framing system of the city (see Figure 6, pg. 23). Supply-side interventions act on the drivers of urbanization to reduce stress on the city. Demand-side interventions are actions within the city to improve resilience, while framing system interventions address how the city develops by altering interaction with global networks. Effectiveness of these

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[76] Ibid.

[77] Ibid.

[78] Ibid., 29

[79] Ibid., 31

[80] Ibid., 32

[81] Ibid., 36

interventions would increase with iteration, as each action generates more data allowing one to understand the system.[82] Interventions are not solely in the military domain; any government or organization, at any level, may conduct them.
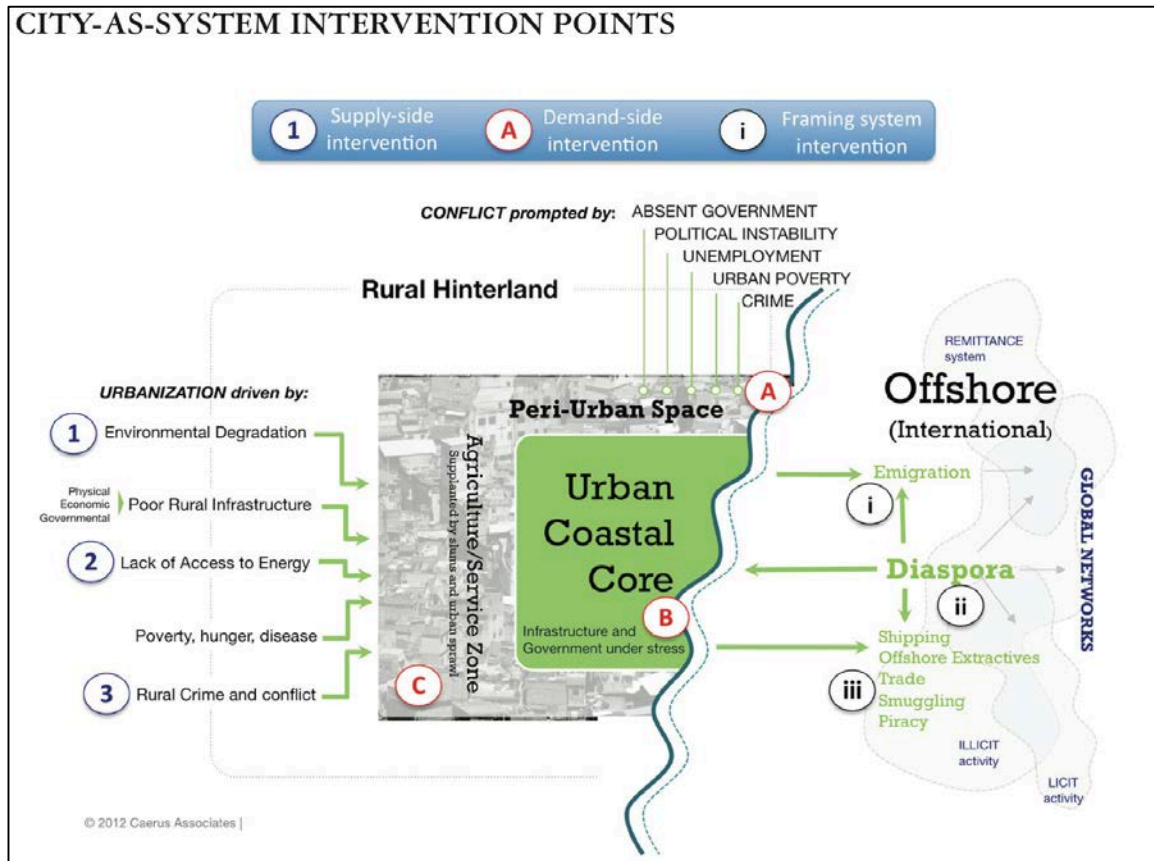
Figure 6. *City as a System Intervention Points*

Source: Kilcullen, David J. "The City as a System: Future Conflict and Urban Resilience." The Fletcher Forum of World Affairs 36, no. 2 (Summer, 2012): 27.

The city as a system model provides an interesting theoretical lens for appreciating megacity environments. Its primary advantages include seeing the city as part of a larger global system, providing a methodology for approaching intervention in the environment, yet is general enough to be applied to virtually any large city in a coastal littoral. The model does not largely account for cities that do not lie in coastal littorals. In addition, it is largely oriented towards

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[82] Ibid.

taking action in semi-permissive environments. Finally, it is an extremely linear model, with no accounting for flows of goods and populations away from the city towards the rural.

<div align="center">Academic Challenges</div>

Several academic models currently exist for studying urban phenomena. Most models use computer simulation to predict outcomes that will assist urban planners. The most successful models for simulating cities focus on urban sub-systems at city (macro). intra-city (meso), and individual (micro) scales.[83] Phenomena explained in these models include interregional migration, traffic flow, formation of urban heat islands, urban epidemic outbreaks, vehicle parking behavior, and emergency evacuation behavior to name a few.[84] Complex sub-systems in megacity environments may be modeled successfully because they limit the scale, and are "…often developed for independent purposes, with purpose specific data models, methodological approaches spatial resolutions, constraining assumptions, system closures, times scales, and so on."[85] Translating this success to an overarching megacity model is inherently difficult, however.

Academia faces many of the same challenges in understanding megacity environments that the US Army does. First, the scale of the environment makes it difficult to know the usefulness of a model, as "…garnering ground truth for the purposes of model-fitting is a very difficult task."[86] Another challenge is the sheer size of the software engineering and computing requirements for complex, large-scale environments. Developing a predictive model that can represent the massive number of interacting components in the environment, measure their

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[83] PM Torrens, "Modeling Megacity Futures," Symposium on Megacities, Sonny Astani Department of Civil and Environmental Engineering, Viterbi School of Engineering, University of Southern California, Los Angeles, November 10-11, 2008.

[84] Urban heat islands are simply cities with significantly higher average temperatures due to human activity. Torrens, "Modeling Megacity Futures," 3.

[85] Ibid.

[86] Torrens, "Building Mega-models for Megacities," 411.

feedback to the system, while scaling from micro to macro levels is incredibly difficult.[87]

CASE STUDIES: THREE DEVELOPING MEGACITIES

This section will examine three developing megacities in Africa, Asia, and the Middle East in the context of the city as a system and strategic appreciation models. Megacities in developing countries typically suffer from several destabilizing dynamics. Though each one of these cities is unique, they consistently demonstrate similar problems such as political instability, access to resources, environmental danger, economic disparity, poor infrastructure and nascent security. Additionally, their explosive growth and regional security challenges suggest they could be future conflict environments. Finally, each of these cities represents a complex, adaptive system whose underlying dynamics are largely opaque.

Karachi, Pakistan

The megacity of Karachi is located in the South of Pakistan, positioned on a coastal littoral at the mouth of the Gulf of Oman, opening to the Arabian Sea. The United Nations (UN) estimates Karachi currently has a population in excess of sixteen million people, projected to increase to twenty-five million by 2030.[88] United Nations estimates are disputed, however, as Pakistan has not conducted a census since 1998. Karachi's actual population is probably in excess of twenty three million.[89] The reasons for the conflicting sizes are largely political, as the last census did not count more than two million alien immigrants settled in Karachi, while current

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[87] Ibid., 412.

[88] United Nations, *World Urbanization Prospects: The 2014 Revision*, 26.

[89] Mahim Maher, "Demography and Migrations: the Curious Case of Karachi's Ghost Population," *The Express Tribune*, 29 March 2014, accessed 17 March 2015 http://tribune.com.pk/story/688569/demography-and-migrations-the-curious-case-of-karachis-ghost-population/.

estimates are depressed to prevent urban domination of the national government.[90] Karachi is one

of the most densely populated regions on earth, covering approximately thirty-five hundred

square kilometers, with as many as seventeen thousand people per square kilometer.[91] In

summary, Karachi is one of the largest, densest, cities in the world and has experienced explosive

population growth in the last decade.

Karachi has a diverse ethnic makeup, shaped by historical events and regional conflict,

beginning with British occupation and development of the city as a trading hub beginning in

1837. British development of rail networks and port facilities that supported the region led to

rapid growth and accumulation of people and capital to the city.[92] Gujarati Muslims initially

settled the area prior to British influence, and still live in the city. Demographics rapidly began

changing in 1947, when Pakistan separated from India and Muslim Indian peoples, termed

Muhajirs, immigrated en masse to Pakistan. Their descendants, primarily Urdu, are the dominant

ethnic group in Karachi, comprising more than half the population.[93] The second largest group is

Pashtun, most of which emigrated from Afghanistan during the 1980s.[94] Finally, there are several

other groups that have migrated into the city for various reasons, including Bengali and Bihari

from Bangladesh and Rohingva from Burma. The divergent ethnic groups are largely segregated

from each other within the city, with migrants primarily populating over five hundred squatter

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[90] Ibid.

[91] The relative population density in Karachi is disputed. Estimates currently range from 17,000 to 24,000 people per square kilometer. Several experts on human geography and demographics agree that the urban population of Karachi is significantly under-counted. For more, see Salman Qureshi, "The Fast Growing Megacity Karachi as a Frontier of Environmental Challenges: Urbanization and Contemporary Urbanism Issues," *Journal of Geography and Regional Planning* 3, no. 11 (2010): 306-321.

[92] Qureshi. "The Fast Growing Megacity Karachi as a Frontier of Environmental Challenges," 311.

[93] Ibid.

[94] Ibid.

settlements on the city periphery.[95]

Karachi has a fractured city government, making consensus on priorities nearly impossible to attain. Governance is largely organized along the ethnic lines of the population. Karachi is currently comprised of eighteen towns, further subdivided into representative Union Councils.[96] On top of the town and council structure, the city divides into six cantonments, each managed by a board primarily consisting of former military personnel.[97] The cantonment councils are in charge of traffic, maintenance, sewers, roads, set fees, and make developmental plans. They are not answerable to the town or council government entities. This organizational structure and political division within the city complicates development. More than half the population occupy slums, water is chronically under supplied, and power outages are common in all parts of the city.[98] In recent years, organized crime has made inroads to city governments, with violence perpetuated against activists of competing political parties for control of neighborhoods.[99] The difficulties of upgrading or developing water and power infrastructure in this political environment have been insurmountable in Karachi.

Karachi is the financial center of Pakistan and is the nation's major seaport. Geographically, the city is in the "center of three great continents, Europe, Africa and Asia."[100] Karachi is home to all of Pakistan's major banks, the headquarters of most multinational corporations, the nations stock exchange, as well as various manufacturing and support centers

[95] Ibid., 312.

[96] Ibid., 307.

[97] Aryn Baker, "Karachi Dreams Big," *Time*, February 8, 2008, accessed December 13, 2014, http://content.time.com/time/specials/2007/article/0,28804,1709961_1711305_1823986,00.html.

[98] Ibid.

[99] Ambreen Agha, "Pakistan: Gangsters Rule in Karachi," *Institute for Conflict Management*, accessed 16 March, 2015, accessed 22 March, 2015 http://www.eurasiareview.com/19082013-pakistan-gangsters-rule-in-karachi-analysis/

[100] Qureshi, "The Fast Growing Megacity Karachi as a Frontier of Environmental Challenges," 307.

for business.[101] Karachi accounts for nearly two thirds of Pakistan's national Gross Domestic

Product (GDP). Additionally, the micro-economy of street vendors and entrepreneurs is largely

unaccounted for in national figures. Karachi is critical to the financial health of Pakistan, even if

it is one of the most violent cities in the world.

Karachi has a long history of political violence, crime, and terrorism. In November of

2008, a significant terror attack by the Islamic terror group Lashkar-e-Taliba on another megacity

(Mumbai, India) was launched from Karachi.[102] This attack was notable for several reasons. The

operation was controlled and monitored from Karachi using mobile phones and social media, and

demonstrated the difficulties in stopping a sophisticated, dispersed terror attack in a megacity.[103]

Terrorism is not only exported from Karachi; attacks on government and infrastructure have risen

precipitously in the last few years, part of a nation-wide trend that began to accelerate in 2007. In

2013, nearly four hundred separate attacks occurred in Karachi, targeting police, government

facilities and private citizens.[104] In recent years, the Taliban have taken control of several Pashtun

neighborhoods and embarked on a campaign of terrorism in the city, including an infamous attack

on the Karachi International Airport in June 2014.[105] The Human Rights Commission of Pakistan

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[101] Emad Sohail, "When Karachi Bleeds, Pakistan's Economy Bleeds," *Center of International and Private Enterprise*, August 22, 2013, Accessed March 22, 2015 http://www.cipe.org/blog/2013/08/22/when-karachi-bleeds-pakistans-economy-bleeds/#.VQ751TBFKTU

[102] Barney and Kadam, "Mumbai 26/11."

[103] Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerrilla*, 74.

[104] START database, University of Maryland, accessed 2 March 2015 http://www.start.umd.edu/gtd/.

[105] Khurrum Anis, Anthony Augustine, Fasee Mangi, "In Karachi, the Taliban Digs in for the Long Haul." *Business Week*, May, 2014, accessed 22 March 2015 http://search.proquest.com/docview/1531102167?accountid=28992.

states that more than eleven thousand people were killed in the city from 2008 to 2012.[106] The citizens of Karachi live in "…a chronic state of fear…it is normalized, a mundane fact of life."[107] Environmentally, Karachi is vulnerable to the elements, especially in the slum communities. Karachi suffers from frequent flooding during monsoon season, and lacks the infrastructure to handle it.[108]

Karachi would be a dangerous city for US Army forces to operate in, in any context. The inability to provide basic services, economic disparity, vulnerability to natural disasters and rise of religious and political extremism within the population is largely representative of an unstable megacity in a developing country. The CSASSG strategic appreciation model would evaluate the city as loosely integrated, while the strategic importance of the economic center of gravity in a nuclear-armed country could lead to several scenarios in which Army or coalition forces would be required to intervene. Because Karachi is not a permissive environment, especially for Western military forces, RAF will not have much ability to shape or prevent conflict in or around the city.

<u>Lagos, Nigeria</u>

Lagos, Nigeria is located in the Southwest corner of the country. Built on a series of mangrove islands adjacent to the Lagos lagoon that stretches East of the city, Lagos now extends over the creeks and swamps that once defined the area. South of the city, the Gulf of Guinea extends into the Atlantic Ocean, while to the North Lagos gives way to dense forest and patches of cultivated land. Like Karachi, estimates of Lagos' population vary, with estimates ranging from fifteen to twenty-four million residents.[109] Lagos is also extraordinarily dense, with built up

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[106] Ibid.

[107] Samira Shackle, "Fear and Violence in Karachi." *New Statesman*, June, 2014, accessed 22 March 2015, http://search.proquest.com/docview/1535664977?accountid=28992.

[108] Baker, "Karachi Dreams Big."

[109] United Nations, *World Urbanization Prospects: The 2014 Revision*, 26; John Campbell, "This is Africa's New Biggest City*," Council on Foreign Relations blog*, accessed

areas exceeding twenty thousand people per square kilometer.[110]

Ethnic violence is rooted in Nigerian history. The Biafra war, in which ethnic Igbo attempted to secede from Nigeria before a forced reintegration, lasted for three years beginning in 1967 and resulted in over one million casualties.[111] Three ethnic groups, the Hausa, Ibo, and the Yoruba, dominate Lagos.[112] The Ibo are predominantly Christian, whereas the Yoruba are predominantly Muslim; even so, a quarter of the Yoruba are Christian as well.[113] The Hausa are the smallest of the three groups, hailing from Northern Nigeria, and are predominantly Muslim. Though Lagos has a history of ethnic violence, primarily between Christian and Muslim people, the city currently enjoys limited strife along ethnic lines. The status quo in ethnic relations could easily be upset, however, if tensions that have been constrained to the North of the country migrate to Lagos.

The city of Lagos is the primary component of Lagos State, which has an elected governor. Underneath the governor, Lagos State consists of five administrative divisions, further subdivided into twenty Local Government Areas (LGA). In Lagos State, sixteen of the twenty LGAs encompass metropolitan Lagos, while four govern less populated outskirts of the city. Lagos has high levels of public and private corruption. Conducting business in Lagos frequently requires cash bribes, while an urban elite with governmental ties control real estate development, resulting in exorbitant pricing and abandoned, half completed projects.[114] Security forces in

March 24, 2015 http://blogs.cfr.org/campbell/2012/07/09/lagos-a-success-story/

[110] Yussuf Lukeman et al., "Environmental Health Condition of Slum Dwellers of Ijora-Badia Area of Lagos State, Nigeria," *Academic Journal of Interdisciplinary Studies* (July 1, 2014), 80, accessed March 24, 2015, http://www.mcser.org/journal/index.php/ajis/article/view/3074.

[111] Philip O. Sijuwade, "Ethnic Tolerance in Urban Nigeria: The Case of Lagos, Nigeria," *The Social Sciences* 6, no. 1 (January 1, 2011): 34–39.

[112] Ibid., 36.

[113] Ibid., 37.

[114] Will Connors, "Reclaiming Lagos." *Time*, February 8, 2008, accessed March 22, 2008 http://content.time.com/time/specials/2007/article/0,28804,1709961_1711305_1837271,00.html.

Lagos conduct routine extortion, extracting money from visitors and the civilian population at large.[115] A private firm authorized to keep ten percent of all tax revenues collects taxes that are then furnished to the Lagos State government; unsurprisingly, this company has ties to a former mayor, Bola Tinubu.[116]

Privatization and enforcement of tax collection in Lagos has resulted in significant monthly revenue for Lagos State (from four million in 1999 to forty-three million per month in 2014), resulting in several ambitious projects to address the woeful infrastructure of Lagos.[117] These projects range from dedicated bus lanes and roadway expansion to installation of light rail in the city; projects that are more feasible include dedicated road maintenance, trash collection initiatives, and radio stations dedicated to traffic.[118] Despite these initiatives, traffic in Lagos is overwhelming. Additionally, Lagos has virtually no infrastructure that extends to the poor communities, and over seventy percent of the population lives in slums with no services and hazardous environmental conditions.[119] Power generation is grossly inadequate in the city, providing less than ten percent of the cities power needs.[120] Accordingly, the citizenry and business utilize privately owned diesel generators to make up the difference, resulting in electrical supply being vulnerable to fluctuations in oil prices.[121] Slum communities are dependent on externally sourced cisterns for water, and waste goes directly into streets or waterways.[122] Gentrification, water scarcity, power generation, sanitation, waste management, and traffic

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[115] Eells, "A Wild Week in Lagos."

[116] Campbell, "This is Africa's New Biggest City*,*"

[117] Ibid.

[118] Ibid.

[119] I.O. Adelekan, "Vulnerability of Poor Urban Coastal Communities to Flooding in Lagos, Nigeria." *Environment and Urbanization* 22, no. 2 (October 1, 2010): 433.

[120] Vivienne Walt, "Lagos, Nigeria: Africa's Big Apple," *Fortune*, June 12, 2014, accessed March 27, 2015 http://fortune.com/2014/06/12/lagos-nigeria-big-apple/.

[121] Fells. "A Wild Week in Lagos."

[122] Ibid.

congestion will likely plague the city for years to come.

Lagos is the economic center of Nigeria, which has the largest economy in Africa.[123] Despite its problems, Lagos generates nearly one quarter of Nigeria's Gross Domestic Product (GDP).[124] In 2013, the city contributed over one hundred twenty billion dollars to Nigeria's GDP. The oil industry is by far the largest industry in Nigeria, but Lagos is home to several emerging ventures including mobile communications firms, a film production industry (Nollywood), and several manufacturing enterprises.[125] Though Lagos is home to many affluent individuals, the economic reality for most citizens is stark, as "sixty percent of Nigerians live on less than a dollar twenty-five a day."[126]

Lagos is a challenging security environment. Street gangs, called "area boys" by locals, control most slum communities.[127] Criminal activity is significant, beginning with myriad pickpockets, thieves, and corrupt officials at the international airport.[128] Islamic fundamentalism is another developing threat to Lagos. Boko-Haram, a militant Islamic movement that primarily operates in northern Nigeria, recently bombed facilities in the city port district.[129] The influx of terrorism, previously contained to the Northern rural outskirts of Nigeria, adds another factor of instability to a city that was already struggling to stay afloat. Lagos does have sizeable and well-armed law enforcement groups, but their effectiveness is questionable. For example, five separate

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[123] Walt, "Lagos, Nigeria: Africa's Big Apple."

[124] Xan Rice, "Lessons from Lagos." *Financial Times*, Jun 29, 2012, 7, accessed April 2, 2015, http://search.proquest.com/docview/1022639831?accountid=28992.

[125] Anonymous, "Nigeria's GDP: Step Change," *The Economist*, April 12, 2014, accessed March 26, 2015, http://www.economist.com/news/finance-and-economics/21600734-revised-figures-show-nigeria-africas-largest-economy-step-change.

[126] Walt, "Lagos, Nigeria: Africa's Big Apple."

[127] Fells. "A Wild Week in Lagos."

[128] Ibid.

[129] E.W., "Boko Haram Extends Its Reach," *The Economist*, July 15, 2014.

security organizations specifically oriented on traffic serve as extortion platforms for employees while doing little to ameliorate traffic congestion.[130] Illicit networks in Lagos pursue narcotics, human trafficking, arms smuggling, and oil theft; many of these networks link to government officials.[131] Finally, Lagos has several alternatively governed spaces, where critical community resources like hospitals and schools exist outside government.[132]

Lagos would present specific challenges for Army forces called on to conduct operations there; the city is rife with corruption, densely packed, difficult to transit, and ethnically diverse. Like most developing megacities, Lagos has enormous gentrification, poor services, and inadequate infrastructure. Despite this, several mitigating factors for Army forces include the preponderance of English speakers and generally positive perceptions of the United States. The CSASSG model classifies Lagos as loosely integrated, noting that existing governance structures lack the capability to enforce regulations or alleviate pressure on infrastructure.[133] The regional importance of Lagos, combined with its vulnerability to natural disaster and potential for social unrest linked to terrorism or gentrification, could potentially lead to Army forces operating there.[134]

Cairo, Egypt

The ancient city of Cairo is located in Northeast Egypt, south of the Mediterranean Sea. The north-flowing Nile River bisects Cairo, and is the primary source of drinking water and electricity production. To the east and west, the city gives way to open desert. To the north, Cairo

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[130] Fells, "A Wild Week in Lagos."

[131] Several sources lead to this conclusion, ranging from an expose on human trafficking that appeared in *The Week* to narcotics articles in *The Economist.*

[132] Chief of Staff of the Army Strategic Studies Group, *Megacities and the United States Army*, 19.

[133] Ibid.

[134] Ibid.

pushes against the Nile Delta. The UN estimates that Cairo is home to sixteen million people, forecasting an increase to twenty-four million by 2030.[135] When accounting for the greater metropolitan region of suburbs and industry around Cairo, estimates of the total population expands to over twenty million people. Cairo is also densely populated, estimated to have fifteen thousand people per square kilometer.[136] Some neighborhoods, particularly slums, are nearly three times as dense. Cairo has experienced explosive population growth in the last two decades resulting in a youth bulge, defined as a sizeable population between fifteen and twenty-four years of age.[137] In Egypt, over fifty-four percent of the population is under twenty-four years of age.[138] In Cairo, where college education is free, severe unemployment and chronic underemployment of the youth bulge demographic (especially the educated) is a destabilizing force.

The geography of Egypt is partly to blame for the congestion in Cairo; the only regions in Egypt that are capable of supporting large populations, industry, etc. are along the Nile. Accordingly, over ninety-six percent of Egypt's population lives in four percent of the country.[139] The overwhelming population density in Cairo has resulted in ambitious projects from the national government to build new cities in the Eastern and Western Desert from scratch. The latest project, dubbed "the Capital," will attempt to relocate Egyptian national government and finance sectors fifty kilometers east of Cairo, but it remains to be seen whether the project is feasible.[140]

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[135] United Nations, *World Urbanization Prospects: The 2014 Revision*, 23.

[136] Wendell Cox, "The Evolving Urban Form: Cairo," *New Geography blog*, June 13, 2012, accessed March 21, 2015, http://www.newgeography.com/content/002901-the-evolving-urban-form-cairo.

[137] Daniel LaGraffe, "The Youth Bulge in Egypt: An Intersection of Demographics, Security, and the Arab Spring," *Journal of Strategic Security* 5, No. 2 (2012): 67.

[138] Ibid., 72.

[139] Arwa Ibrahim, "Doubts raised over achievability of Egypt's 'new capital' ," *Middle East Eye*, March 17, 2015, accessed March 24, 2015, http://www.middleeasteye.net/news/egypts-new-capital-1280559810.

[140] Ibid.

Ethnically, Cairo and Egypt as a whole are relatively homogenous, with more than ninety-nine percent of the population being Egyptian Arabs. Cairo's population is ninety percent Sunni Muslim, the remainder being Christian (primarily Coptic Christians). There is not significant disharmony in the city along ethnic or religious lines, though many of Cairo's Christians reside in the outer slums of the city, predominantly employed as unofficial garbage collection and recycling entrepreneurs.[141] Recently, the influx of Syrian refugees, primarily to Cairo, has created minor friction within communities. Overall, the shared heritage of the vast majority limits ethnic strife in this megacity.

Governance in Cairo is heavily centralized, with primary control of funding for the city being exercised at the national level.[142] Cairo has five Governates (Cairo, Helwan, 6th of October, Giza, Kalyoubia), each encompassing urban and outlying rural communities near the city. Each Governate has an administrative council with elected and appointed representatives. In effect, Cairo has five governors who answer to myriad local and national concerns; government bodies connected to the people, particularly the administrative councils, have limited influence over funding for their districts. [143] This governmental dissonance has led to a long term trend of national resources being continually plunged into developments that support affluent citizens, while largely ignoring the unplanned settlements on the city periphery as well as the historical core of the city.[144] The result is a heavily gentrified megacity comprised of squalid unplanned

[141] Patrick Kingsley, "Waste Not: Egypt's Refuse Collectors Regain Role at Heart of Cairo Society*," The Guardian*, March 27, 2014, accessed March 26, 2015, http://www.theguardian.com/global-development/poverty-matters/2014/mar/27/waste-egypt-refuse-collectors-zabaleen-cairo.

[142] Muneeb Ansari, "Who Rules: Governance Structure's Importance in Cairo's Urban Planning*," Cairo From Below blog,* September 21, 2011, accessed March 3, 2015, http://cairofrombelow.org/2011/09/21/who-rules-governance-structures-importance-in-cairos-urban-planning/.

[143] Ibid.

[144] Mohamed Abdelbaseer, "Cairo's Metropolitan Landscape: Segregation Extreme*," Failed Architecture blog*, February 27, 2015, accessed March 26, 2015, http://www.failedarchitecture.com/cairos-metropolitan-landscape-segregation-extreme/.

settlements and a decaying urban core ringed by wealthy, gated communities and developments.

Cairo, like the rest of Egypt, faces significant economic headwinds. According to the International Monetary Fund, unemployment in Egypt is approximately fourteen percent, but the World Economic Forum indicates it is really thirty to forty percent. The economy dipped significantly in 2011, following the revolution that resulted in the ouster of President Mubarak and the eventual installation of Muslim Brotherhood leader Mohammed Morsi. The political instability of a revolution, coupled with Islamist policy crushed the Cairo centered tourism industry, which comprised more than ten percent of the national economy. Economic reforms enacted in 2014 are beginning to show positive effects, but Egypt and Cairo will be dependent on foreign aid for the foreseeable future.[145]

Cairo has seen rising terrorism, crime, and tumultuous political violence since the 2011 overthrow of Mubarak. Terrorism, once confined to the Sinai region of the country, has penetrated the city in the form of car bombs, improvised explosive devices, and suicide bombers. According to the US Department of State, the primary targets of bombings are police and government facilities.[146] There were over thirty-eight terror attacks in Cairo in 2013, the perpetrators primarily being Islamist groups.[147] Illegal activity is significant, with expatriates and tourists being primary targets for criminals. Cairo has a long tradition of public political demonstration prone to violence. In 2011, a massive days-long political demonstration in Tahrir square (in the center of Cairo) that was part of the "Arab Spring" resulted in the overthrow of long time President Hosni Mubarak.[148] Two years later, the Egyptian military deposed the elected

[145] Mark Esposito, Maret Al-Sayed, "Why Egypt's Economic Woes Are Overstated," *World Economic Forum Blog*, October 24, 2015, accessed March 25, 2014, https://agenda.weforum.org/2014/10/egypt-gdp-microfinance-formal-economy/.

[146] START database, University of Maryland, accessed March 26, 2015, http://www.start.umd.edu/gtd/.

[147] Ibid.

[148] Alastair Beach, "The Cairo Coup: Egypt's Leader Mohamed Morsi in Custody After Being Ousted by Army*," The Independent*, July 4, 2013, accessed March 26, 2015,

President Mohammed Morsi following protests in the same location. The resulting counter-demonstration of Muslim Brotherhood supporters resulted in violence between armed demonstrators and security forces.[149] In addition to political motivations for crowd violence, soccer matches have also resulted in riots in recent years.[150] Though Cairo currently appears relatively stable, recent history suggests that violence and terrorism will continue to be a daily aspect of life.

Cairo has been wracked by political upheaval in recent years, but the Egyptian military is a consistent and strong force capable of stabilizing the country when necessary. A long partnership between the US Army and the Egyptian Army has resulted in solid relationships. Despite this, there is unquestionably a strong current of anti-Americanism in the population of Cairo.[151] The anti-American feeling exists across the political spectrum. Muslim brotherhood supporters are upset that American leaders failed to acknowledge a military coup; those that support the removal of Morsi feel that American leadership supported Morsi as he became increasingly autocratic.[152]

In summary, the political, military, and economic environment in Cairo makes the employment of RAF to shape and prevent conflict there questionable. The presence of Army forces on the ground in Cairo has the potential to degrade support for Egyptian military forces while reinforcing negative stereotypes about American imperialism. Cairo's struggles to

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http://www.independent.co.uk/news/world/africa/the-cairo-coup-egypts-leader-mohamed-morsi-in-custody-after-being-ousted-by-army-8686282.html.

[149] Jeremy Bowen, "*Egypt Crisis: Deaths as Cairo Violence Resumes,*" *British Broadcasting Corporation*, August 16, 2013, accessed March 26, 2015, http://www.bbc.com/news/world-middle-east-23721584.

[150] US Department of State, Bureau of Diplomatic Security, accessed March 26, 2015, https://www.osac.gov/Pages/Home.aspx.

[151] Margaret Warner, interviewed by Hari Sreenivasan, *PBS News Hour*, September 7, 2013, accessed March 26, 2015, http://www.pbs.org/newshour/bb/middle_east-july-dec13-warnerintervie_09-07/.

[152] Ibid.

consistently provide water and energy, gentrification, high unemployment, and rising religious and political extremism within the population present significant challenges to the city. The CSASSG strategic appreciation model would likely evaluate the city as moderately integrated, despite the unstable dynamics of the city; this is because of the capability of the Egyptian Army to stabilize situations with the consent of large portions of the population. Egypt is a long-term ally, and it is certainly within national security interests to ensure they remain so, but the fact that Cairo is not a fully permissive environment coupled with political ramifications of US presence on the ground suggests that RAF is not the right tool to help.

REGIONALLY ALIGNED FORCES AND MEGACITIES

This section describes the reasons that RAF will not result in appreciable understanding of megacity environments, nor directly influence the development of effective operational approaches. It is evident that megacity environments will present significant challenges to expeditionary military forces. The scale and type of operation, context for intervention, cultural identity of the city, coalition of adversaries, and the specific city in question will largely determine the difficulties inherent in operating there. It is no surprise those methodologies for appreciating megacities in academic and military settings view the problem through the lens of complex, adaptive systems. When approaching the megacity environment in this fashion, the utility of the RAF construct demonstrates clear inadequacy in intent, capability, and implementation.

Intent

RAF is at heart a tactical solution to provide geographic combatant commanders with forces that are familiar with their regions. The concept represents a shift of emphasis for the

Army, prioritizing conflict prevention and preparation while deemphasizing current conflicts.[153] This emphasis is a natural outreach of the 2011 and 2015 National Security Strategy, in which conflict prevention is a major theme. Current Army and joint strategy proposes that security cooperation is the means by which conflict prevention occurs. Security cooperation refers to a broad spectrum of activities that "…build defense relationships that promote specific US security interests, develop allied and friendly military capabilities for self-defense and multinational operations, and provide US forces with peacetime and contingency access to a host nation."[154] Activities conducted under the auspices of security cooperation range from providing humanitarian aid to arming, training, and equipping host nation military forces. RAF should theoretically improve security cooperation performance by establishing habitual relationships and developing regional familiarity. For geographical combatant commanders, it provides access to a large pool of Soldiers and units within the continental United States that they can employ to meet their requirements.

The first hint that RAF is not oriented towards megacities is in the name itself: *regionally* aligned forces. There are currently six geographic combatant commands that divide the globe into areas of responsibility (see Figure 7). These geographic regions do not relate to the worldwide dispersion of megacities; for example, AFRICOM has three megacities within its area of responsibility (AOR) while PACOM has sixteen, with several more cities on the verge of eclipsing ten million inhabitants.[155] Despite the strategic pivot of US Defense resources to the Pacific region, the number of megacities in the region will outstrip available RAF units for the near future. Another problem arises when considering city typology using the CSASSG model

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[153] Headquarters, Department of the Army, "Regionally Aligned Brigades EXORD", December 2, 2011, 2.

[154] Field Manual 3-22, *Army Support to Security Cooperation* (Washington, DC: Headquarters, Department of the Army, 2013) 1-1.

[155] United Nations, *World Urbanization Prospects: The 2014 Revision*, 26.

discussed earlier. Specific geographic regions have a disproportionately high number of "loosely integrated" cities prone to instability, CENTCOM and PACOM in particular. Considering that the number of megacities will only increase in the next fifty years and will primarily emerge in developing countries, this problem will only be growing larger as time goes by.

Figure 7. *Geographic Combatant Commands AORs*

Source: Office of the Under Secretary of Defense for Acquisition, Technology and Logistics.

Another issue that RAF units will face is their requirement to be responsive regionally. Though megacities are critical components within regions, they are still a subset of the overall AOR. The majority of Army security cooperation missions involve training and mentorship with host nation military forces, focusing on basic war fighting skillsets. Large population centers are not ideal environments for this type of partnership. Additionally, RAF units typically conduct operations across a large geographic region, such as 1st Infantry Division operations as RAF

assigned to AFRICOM from May 2013 to June 2014.[156] The priority and number of requirements for 1st Infantry Division meant that virtually no experience or information was captured concerning megacity environments.

The vast majority of security force assistance (SFA) missions are military-to-military, whereas most large cities have a diverse set of security forces oriented to specific domains-police, national police, automobile traffic, shipping, etc. In many developing megacities with alternatively governed spaces (Lagos, Karachi, Mexico City), certain areas may have no relevant security force present to partner with. Some cities do extensively rely on national military forces for security, and here RAF may be capable of developing relevant information for planners.

Perhaps the most significant constraint to RAF units developing relationships and understanding in megacities is the requirement for a relatively permissive operating environment. In the three case studies presented earlier, only Lagos would offer an opportunity for RAF units to conduct partnership within the city. Overt US Army presence has the potential to destabilize partners in places like Karachi and Cairo. In the Pacific region, many megacities are not accessible as their governments are hostile or unreceptive to US partnership. RAF units must have access to partners and locales to generate specific and detailed knowledge, and where access is limited, the Army must use other means.

<div align="center">Scale</div>

Megacities are complex, adaptive, systems in which the scale, breadth, and depth of the environment will exceed the capability of RAF units to maintain visibility and understanding. Like any complex, adaptive system, megacities are a changing environment. Because of the level of complexity, the drivers of that change may well be invisible to most observers. Megacities

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[156] MG Paul E. Funk, "Fundamentals: Regionally Aligned Forces." (lecture presented at the 2014 Infantry Conference, Fort Benning, GA, September 8-15, 2014).

have an unknowable number of feedback systems that lead to evolution within the environment. When one of these interdependent components changes behavior in other components, it can lead to rapid and unpredictable change in the overall environment.[157] When viewing megacities as complex, adaptive systems, what is true today may no longer be true tomorrow. The very presence of an RAF unit in a contested megacity would likely have repercussions that affect friendly and enemy alliances, change information flows, and create opportunities for adversaries. In *Out of the Mountains* Kilcullen notes "any outside intervener that takes on a local partner becomes tainted by that partners baggage."[158] In the three megacities presented as short case studies, those affects would likely be profound. A built-in advantage of RAF units is their regional familiarity, but emergent events that tip a megacity into crisis requiring intervention are likely to invalidate much of the organizational knowledge of an environment. RAF units, while able to leverage cultural and language proficiencies, may not be able to utilize previously developed relationships or systemic knowledge in rapidly changing situations.

In permissive environments, RAF units are constrained by deployment timelines, partner forces, command and control capabilities, and the realities of maintaining security and logistical support for the deployed unit. In an environment of massive scale, these requirements are likely to result in minimal interaction with many critical components of the city. RAF units will be dependent on partner forces for developing context, as it is physically impossible to see much of the city. In these situations, RAF units may be very capable in developing relationships and understanding partner capabilities, though many components of the operational environment will remain opaque.

<u>Implementation</u>

RAF units assigned to geographic regions are still beholden to the Global Force

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[157] Ryan, *Art of Design*, 26.

[158] Kilcullen, *Out of the Mountains*, 234.

Management system that allocates forces worldwide. This reality is acknowledged in the RAF Order from the Army Chief of Staff, published in 2012, that requires RAF units to prioritize their functional war fighting training (decisive action) over RAF specific training until they are proficient.[159] The reality is that emergent situations worldwide will cause many RAF units to deploy outside their assigned region on expeditionary operations. If fiscal austerity continues to degrade the size and readiness of the Army, maintaining responsive RAF units will be a significant challenge.

The life cycle of most RAF units under the Army Force Generation process (ARFORGEN) currently resets on a roughly three-year timeline, and currently there are no habitual (meaning multiple life cycle) relationships with combatant command AORs. This results in several impediments that affect the ability of RAF units to develop detailed knowledge of megacity environments. The requirement to focus training towards decisive action means commanders must prioritize, while balancing myriad other requirements of which regionally aligned training is just one component. Additionally, COCOM requirements can result in RAF units deploying early in the RAF training window at the conclusion of decisive action training, before programmed regional training has begun. This was the case for 2/1 ABCT assigned to AFRICOM in 2013-3014. Finally, significant experience is lost due to Soldiers and leaders leaving the Army or moving to new units when a lifecycle ends. Combining these factors with the requirement to function in entire regions rather than specific cities constrains RAF unit abilities to attain detailed knowledge of many megacities.

CONCLUSION AND IMPLICATIONS

RAF, while providing useful tactical capabilities like cultural and language familiarity, are inadequate for developing comprehensive information about megacity environments. The

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[159] Headquarters, Department of the Army, "Regionally Aligned Brigades EXORD."

RAF concept is far from useless, however. The critical aspect of dense, urban environments is the human population that lives there. It is the interaction, motivations, cultures, and identities of city inhabitants that make the environment complex rather than complicated. The human population is the gravity that lends weight to the mass of the city, and the primary source of friction in the urban battlefield. This human factor that underlies all aspects of the megacity belies the importance of the RAF mindset. When intervention is required, the Army's ability to interface with the population, security forces, political leaders, and businesses of major urban areas will be the primary source of the contextual information that informs understanding. While the RAF construct will likely deliver minimal information of use on megacities prior to intervention, the mindset RAF activities inculcate sets the conditions for future success. This mindset of human engagement will help in complex environments, and may be critical to avoiding counter-productive actions at the tactical level that could have negative strategic consequences.

The current focus on megacity operational environments distracts from the implications of the global urbanization trend. In Africa for example, while there are only three current megacities (Lagos, Kinshasa, Cairo), there are forty-seven cities with population sizes ranging from nearly one million to seven million.[160] The UN projects that by 2030, there will be approximately fourteen hundred cities worldwide whose populations exceed five hundred thousand.[161] Even so, over half the world urban population will live in cities with less than five hundred thousand residents. This data suggests that megacities are a small part of the overall urbanization phenomenon, and limiting perspective to forty megacity environments would be shortsighted. This analysis further implies that focusing RAF units on megacities would not be productive to overall national security goals.

There are several ways the Army could improve understanding of large cities. For tactical

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[160] United Nations, *World Urbanization Prospects: The 2014 Revision,* 14.

[161] Ibid.

training, several Department of Defense (DOD) owned facilities closed by Base Realignment and Closure processes could serve as training grounds for tactical actions and testing of new technology. In addition, domestic cities with closed port facilities might be accessible for training purposes, important because many large cities and most megacities are in littoral zones. The littoral and riverine component in most megacities implies that most megacity operations will be joint, requiring significant assistance for Army units from sister services. Biometrics could serve as a critical tactical tool to identify illicit networks and bleed over between criminal and enemy elements.

Expansion of the RAF program to the institutional Army could lead to several opportunities to educate and provide experience to Army officers. For example, sending School of Advanced Military Studies or War College graduates on short-term deployments following graduation to permissive megacity environments would develop invaluable experience at the operational level. These officers would work with city leaders and managers in developing, explosive growth cities to identify the challenges and constraints inherent in these environments. Training With Industry programs that send officers to work with domestic city managers in major urban areas may allow for development of systemic understanding of these environments. Implementation of programs along these lines would have a short-term cost in time, but would be a relatively inexpensive way to develop operational and strategic understanding of major urban areas in a variety of locales. The interaction of field grade leaders with public servants of large cities would have long-term gains in engagement and relationship building with foreign and domestic leaders.

Doctrine is the primary lens through which units and leaders perceive problems and how to approach solving them. Doctrinal updates to *FM 3-06 Urban Operation* that address friendly limitations due to scale, incorporate design methodology, and acknowledge that in certain cases the city *is* the mission will be important for improving understanding across the Army. The professional military education system (PME) could evaluate the benefits of exposing junior

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officer populations to complexity, systems thinking, and design earlier in their careers. Finally, establishment of an urban contemporary operating environment database with input from RAF units, officers on the aforementioned fellowships to large cities, and study teams focused on specific urban areas would provide a primary resource for planning when intervention is on the table. Study teams or operational planning teams that develop detailed information on specific urban areas would prioritize cities prone to instability that dovetail with national security interests when populating the database. In this situation, the CSASSG model would be a good starting point to assess large cities.

The RAF concept is an evolving one. Like any major initiative in an organization as large as the US Army, addressing the specific challenges in funding, force allocation, training, etc. will require time and iteration. The development of comprehensive knowledge of specific megacity environments will likely require a whole-of-government approach, inclusive of academic experts. In any such endeavor, the Army could play a significant role. During a visit to the Command and General Staff College in November of 2014, Army Capabilities Integration Center (ARCIC) commanding general H.R. McMaster noted that as an Army, "…we get the future wrong one-hundred percent of the time." Emergence, then, is everywhere. In an uncertain future, the Army leaders that succeed in megacity environments will be those with judgment, informed by history and theory, honed through experience as Army professionals.

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