

아프가니스탄 폭탄테러공격에 관한 지리-공간 분석

윤 민 우*

〈요 약〉

2001년에 있었던 OEF(Operation Enduring Freedom)이후로 아프가니스탄은 글로벌 테러리즘과의 전쟁에서 중요한 전쟁터의 하나가 되어왔다. 지난 10년 동안 미국 정부와 동맹국들과 아프가니스탄 정부는 테러리스트들과 무장 항쟁자들(insurgents)을 분쇄하고 동시에 전국적으로 기능하는 통치시스템을 구축하기 위해 상당한 노력을 기울여 왔다. 하지만, 그러한 목표는 여전히 그 끝이 보이지 않는 것 같다. 아프가니스탄에서의 테러와 무장항쟁은 여전히 활발히 전개되고 있으며 골칫거리가 되고 있다. 따라서 이 연구는 전쟁으로 상처받은 아프간 국가에서 일어나는 테러 문제들을 보다 효과적으로 다루기 위해 필요한 의미 있는 지식과 정보를 얻기 위해 시도되는 노력 가운데 하나이다.

이 연구는 2004년에서 2007년 사이에 아프가니스탄에서 발생한 폭탄테러 사건에 관한 분석된 정보를 제공하고자 하는 목적을 가지고 있다. 이를 위해 이 연구는 아프간 폭탄테러 공격의 공간적 분포 양상을 파악하기 위해 GIS (Geographic information System) 분석 기법을 채택한다. 이 연구의 구체적 초점은 테러리스트가 어떤 목표물을 공격할 것인가를 결정할 때 합리적으로 행동할 것인가를 검토하고자 하는 것이다. 분석을 위해서, 이 연구는 지역적인 특성이 폭탄테러 공격의 목표물이 되는 위험성에 어떤 영향을 줄 것인가 하는데 초점을 맞출 것이다. 이 연구의 가정을 검토하기 위해서 폭탄테러 공격의 대상이 가지는 지리적 또는 공간적 특성이 테러리스트가 지불해야 하는 공격을 실행하는데 드는 비용과 어떻게 상호작용하는지를 살펴볼 것이다. 이를 위해 이 연구는 1) 아프가니스탄에서 폭탄 테러 공격의 공간적 분포양상을 보여줄 것이며, 2) 테러 조직의 본부(또는 주요 거점)와 폭탄테러가 발생한 지역 간의 거리의 관계를 조사할 것이다.

주제어 : 지리공간 분석, 폭탄테러 공격, 테러리즘, 무장투쟁(Insurgency), 아프가니스탄

* "이 논문은 2012년도 가천대학교 교내연구비 지원에 의한 결과임."(GCU-2012-R258)

** 가천대학교 경찰·안보학과 조교수

목 차

- I. Introduction
- II. Literature Review
- III. Research Method
- IV. Analysis and Discussion
- V. Conclusion and Limitation

I. Introduction

Since the launch of Operation Enduring Freedom in 2001, Afghanistan has been a critical battle ground for war against global terrorism. For the last 10 years, the U.S. government and its allies and the Afghan government have put a considerable effort to crush terrorists and insurgents and at the same time to construct nationwide governance system. Yet, the noble mission still seems far from complete. Terrorist or insurgent operations in Afghanistan are still active and troublesome. As recently as this March in 2011, police and military forces across Afghanistan are on high alert to prevent attacks from Taleban forces (Faiez, 2011). Thus this subject of terrorism and insurgency continues to draw a considerable attention of research or investigative reports to grasp an insightful knowledge or intelligence that may allow a better handling of terrorist troubles in this war-torn nation.

The study on terrorism and insurgency in Afghanistan has a certain merit. Afghanistan is an area which has experienced the high frequency of terrorism (or insurgent) incidents in recent history. This high level visibility of terrorism (or insurgency) itself justifies the necessity of terrorism study on this region in order to improve the situation and build stability in this country. Also, the high level of incident

in Afghanistan can provide rich data of terrorist operations. Since the fall of Taleban regime in 2001, a great number of terrorist incidents have been reported by various international media outlets. Although these media outlets no way exclusively cover all incidents occurring in Afghanistan, perhaps they could provide enough number of meaningful data to show the general picture of terrorist incidents on this country if carefully and rigorously collected. A good enough number of cases are a pre-condition for the application of systematic quantitative study. In this regard, terrorist incidents in Afghanistan may satisfy the pre-condition for the quantitative study due to the availability of a large enough number of incidents occurring so far (See the ISVG, 2006).

Despite a considerable number of researches and analysis reports on the Afghanistan insurgency and terrorism having been produced thus far (Canfield, 2008; Gunaratna & Nielsen, 2008; Kaplan, 2005; Kepel, 2002; Nojumi, 2008; Rashid, 2000; Rashid, 2002; Rzehak, 2008; Shahrani, 2008; Shultz & Dew, 2006; Sinno, 2008; Taras & Ganguly, 2008; Tarzi, 2008; Yun, 2009), an insightful and well-analyzed study may still be welcomed to search for a would-be magic-bullet to critically strike on Afghan terrorists and insurgents. Most studies (Canfield, 2008; Gunaratna & Nielsen, 2008; Kaplan, 2005; Kepel, 2002; Nojumi, 2008; Rashid, 2000; Rashid, 2002; Rzehak, 2008; Shahrani, 2008; Shultz & Dew, 2006; Sinno, 2008; Taras & Ganguly, 2008; Tarzi, 2008; Yun, 2009) conducted so far have been qualitative and anecdotal researches or reports. Although those previous contextual studies deliver much valuable knowledge and information on understanding Afghan terrorism and insurgency and discovering an effective policy measure to combat against it, a systematic study quantitatively conducted and analyzed seems also necessary to enrich our understanding on the topic and assist the search of an effective counterterrorism measure by giving us a more systemic and meta-analyzed picture on the Afghan situation. Yet, unfortunately the number of quantitative study is still relatively limited comparing to that of qualitative one. Thus, more quantitative studies may be invited as a welcome addition to enrich our understanding on Afghan terrorism and to search for a better policy measure against it although this does not mean that quantitative study is necessarily superior to qualitative study.

This study hopes to serve this purpose by providing analyzed information on terrorist bombings in Afghanistan occurring between 2004 and 2007. It adopts GIS (Geographical information System) analysis technique as a quantitative measure to uncover spatially patterned aspects of terrorist bombing attacks in Afghanistan. The specific focus of this study is to describe patterns of terrorist bombing attacks over the years across Afghanistan and then understand what explains the patterned bombing attack if any uncovered. The study hypothesizes that terrorist rationality produced the patterned results because they are produced by terrorists' cost-benefit analysis rationally conducted. In other words, terrorists behave rationally when they decide which targets to attack. In this process of calculation, characteristics of localities may have a significant impact on the cost-benefit calculation. Thus, this study hypothesizes that the founding of patterned bombing attacks could indirectly support the terrorist rationality. To examine the hypothesis of this study, it will explore how the spatial risk of becoming targets of terrorist bombing attack interacts with cost necessary for the execution of attack paid by terrorists; 1) by demonstrating the spatial distribution of bombing attacks in Afghanistan and 2) by estimating the distance between headquarters (or safe haven) of terrorists groups and the bombed target area.

It is expected that the findings of this study could contribute to the better understanding of terrorist incidents and behavior in Afghanistan and the development of counterterrorism policy measures based on those findings which could eventually help to build stability in this war-torn nation.

II. Literature Review

1. Conceptual clarification

1) Terrorists and insurgents

Regarding the study of Afghanistan terrorism (or in the same breath insurgency), terminology is a troublesome challenge. Both terrorists and insurgents are ambiguously

mixed-used. Other terms like extremists, separatists, tribal warriors, combatants, and fighters adds matters worse in the terminology ambiguity. By dictionary definition, insurgents and terrorists have a different meaning. Insurgents include the meaning of rise against (especially the central government), while terrorists include the meaning of engagement of terrorist acts or adoption of terrorist tactic and terror means one's psychological state driven by fear, appalling, frightening, and anxiety. Thus, conceptually strictly speaking, the two terms are different things.

However, in the real world it is not possible to distinguish terrorists from insurgents and also in the same context from other similar kind of terms described above. Especially in Afghanistan where this study is focused on it is almost impossible to separate terrorists from insurgents and other terms in daily use. Indeed those are one and the same thing in most occasions. Journalistic reports on the violent incidents in Afghanistan interchangeably use many different terms for the indication of similar beings who are loosely connected to form a fighting network and fight against the Afghan government run by Hamid Karzai, the U.S. forces, and the ISAF (International Security Assistance Force) forces. Also there is no practical advantage to distinguish terrorists from insurgents. In the scene of Afghanistan, there is no such distinctive separation of terrorist from insurgent on bombing attacks. Here bombing attacks are both terrorist and insurgent attack mostly done by the same actor, Taleban and Taleban-affiliated anti-government forces.

Thus, for this study, insurgent and terrorist will be treated as the synonym and interchangeably used. Other similar terms suggested above will be treated as such. This tentative treatment of terminology can be justified here on the ground that the purpose of this study is the analysis of bombing attack incidents done by Taleban or Taleban-affiliated anti-government forces fighting against the Afghan government.

2) Actors and acts

Actors this study focuses on are Taleban and insurgent groups taking side with Taleban. These actors have fought against the U.S. forces, ISAF forces, and the Karzai-led Afghan government. Taleban is often used as the umbrella term indicating

various different types of insurgents or terrorists including the core Taleban led by Mullah Omar and his commanding staffs and structured as a cohesive paramilitary organization and also various other fighting forces forming alliance with Taleban such as Gulbuddin Hekmatiy's group, Haqqani network, Pashtun tribal warriors, amateurish and temporary fighters, criminal groups, and foreign volunteers (Kilcullen, 2009). A broad definition of Taleban includes all those heterogeneous fighting forces, whereas a narrow definition of Taleban indicates only the core Taleban group. Actors considered for this study are the broadly defined Taleban also including other fighting forces taking side with Taleban such as Al Qaeda and IMU (Islamic Movement of Uzbekistan).

Today's Taleban is a loosely connected network of Taleban core members, other Afghani Islamic extremists, Afghan warlords, Pashtun tribal warriors, part-time fighters, Al Qaeda elements, IMU elements, Pakistani Taleban elements, criminal groups, and foreign volunteers much motivated by Islamic extremism (Kilcullen, 2009). Mullah Omar and his commanding staff called Quetta Shura coordinate and command this loose network of insurgent fighting forces often called as an ambiguous term, Taleban. However, provincial or local groups are independently run by a charismatic leader. The commanding center of Taleban recognizes those local groups and officially or unofficially designates them as a franchise. Some insurgent fighting forces are independent of Taleban command and these groups are only allied with Taleban before the presence of the common enemy, the U.S. and ISAF forces and the Karzai government. They include Haqqani network, Hekmatiyir's group, and Pashtun tribal fighting forces. Foreign groups such as Al Qaeda, IMU, and various Pakistani Islamic extremist groups are included in these allied forces for Taleban. Then, there are other periphery forces only temporarily fighting for Taleban due to various individual motivations. Criminal groups fight for their business interest on drug trafficking or other criminal enterprises (Sinno, 2008; Tarzi, 2008). Part-time fighters, called accidental guerrillas, fight for personal income, amusement, or heroism, or even they fight just because of happening to be there in the middle of combat situation (Kilcullen, 2009). Foreign volunteers participate in the fighting for personal religious motives or pursuing heroism (Roggio, 2011; Rohde, 2007).

Acts this study is eventually interested in are bombing attacks. These bombing attacks include IED (Improvised Explosive Device) attacks, road-side bombs, remotely-controlled bombing attacks, and suicide bombings. Thus, the acts basically include any attack regarding bombing, explosion, or attempted bombing committed by the broadly defined Taleban fighters (See ISVG, 2005).

2. Afghanistan context

1) Tribes, localities, and religion

Afghan insurgency or terrorism cannot be understood without knowing tribes, localities, and religion in this region. Afghanistan is a crudely woven nation that is no way close to nation-state historically produced in the Western Europe (Canfield, 2008; Shahrani, 2008). The Afghan Nation stands on neither *Contracte Social* nor *Geist* (Meinecke, 2007; Renan, 2002). It is the architecture of ignorant Europeans and their strategic negotiations as shown in the example of Durant Line (Shultz & Dew, 2006; Taras & Ganguly, 2008). Today's Afghanistan is the sum of different tribes, localities, and religions without a common denominator which can uphold the nation together (Shultz & Dew, 2006; Taras & Ganguly, 2008).

Tribe is the key word understanding the cosmos of Afghanistan. There are Pashtuns, Tajiks, Uzbeks, Hazars, and others (Afsar, Samples, & Wood, 2008). The broad indication of tribe is further divided into sub-groups. For example, Pashtuns, the largest size of tribal groups in Afghanistan, are subdivided into Duranis and Ghilzais (Afsar, Samples, & Wood, 2008). Then these subgroups are subdivided into smaller tribes, clans, kins, extended families, and families (Kilcullen, 2009). Thus an individual belongs to layers of this kinship, clannish, and tribal entity. His or her loyalty to group follows these various layers of social group formation. The smaller or closer one's group formation is, the stronger one's loyalty is (Kilcullen, 2009). Afghanistan is the cosmos composed of these various layers or sorts of social or family group formation. Thus, the Afghan identity as a nationalism or nation-belongingness has never fully developed. Rather tribal, clannish, or family identity is much stronger and cohesive (Canfield, 2008).

Taleban insurgency hijacked this Pashtun tribal loyalty over underdeveloped loyalty towards the Afghan central government (Kilcullen, 2009).

Locality also plays an important role in the Afghan political scene. Afghanistan, especially the Southern Afghanistan where the insurgency stronghold locates, is mostly made of inhospitable terrain, high mountain areas, and remote countryside (Kilcullen, 2009). Roads are mostly not paved and villages and towns are barely connected by narrow mountain paths and dirt local trails. Here towns and villages are separated from the outside world and they are barely connected through a near-by village and town to the regional center of the Province where an authority representing the Afghan central government presents. Under this condition, Afghan villages and towns in these tribal areas are much relied on self-help style security and thus they are vulnerable to the physical violence and threat from Taleban insurgent forces which immediately present in contrast to the Kabul authority which is remotely located and mostly incapable (Kilcullen, 2009). Also this inhospitable terrain stretches to the Pashtun tribal area in Pakistan across the Durant Line, the formal border between Afghanistan and Pakistan. Villages and towns are here also isolated from the outside world inaccessible by the Pakistani central government authority. Protected by this natural bitterness, Taleban insurgent forces strongly present here and control these areas (Gunaratna & Nielsen, 2008). Connected by mountain paths, Taleban fighters can easily access to the Southern border area of Afghanistan along the Durant Line (International Crisis Group, 2006).

Religion is another factor impacting on the Afghan insurgency phenomenon (Canfield, 2008). Islam is basically the dominant religion in tribes and people of Afghanistan. There are some variations. Hazaras are shias and most Pashtuns, Tajiks, and Uzbeks are sunnis (Canfield, 2008). Upon a long historical tradition of Islamic practice, Islam deeply influences thoughts, customs, beliefs, values, and social life in the Afghan villagers (Rashid, 2002; Shahrani, 2008). Sunni-based Islamic extremism hijacked this devious tradition of Islamic religion. It blackmailed, persuaded, or replaced a religious authority in local villages and towns and thus preached their version of extremism and controlled politics of local areas (Rashid, 2000; Rzehak, 2008; Sinno, 2008).

Afghan insurgency or terrorism is the outcome of interaction between these three

factors, tribes, localities, and religion. It is the sum of Pashtun, especially Ghilzai Pashtun, tribal interest, aspiration and propaganda for sunni extremism, and marginal locality conditions of villages and towns in the countryside of the Southern Afghanistan along the Pakistani border area (Afsar, Samples, & Wood, 2008; Kilcullen, 2009; Sinno, 2008).

2) Taleban and Islamic extremism

Taleban is a sunni-based Islamic extremist movement. It hopes to establish the strongly religious regime where Islamic fundamentalist principle dominates all other aspects of human affairs, including politics, law, and social matters. According to Taleban beliefs, there is no separation between religion and politics. Individualism and modern life style is evil which should be removed from the Afghan society. Their version of comprehension on the meaning of Koran verses and Islamic preaching is the only guide for human affairs. Ultimately Taleban strives for the achievement of the Islamic sharia state totally immune from the Western or modern influence (Kepel, 2002; Rashid, 2000).

Taleban is closely associated with similar Islamic extremist movements such as salafism or wahabism which is the religious principle of Al Qaeda or Egyptian Islamic Jihad (Kepel, 2002). Islamic salafists and wahabists basically pursue similar goal, the establishment of Islamic fundamentalist regime where Islamic religious principles supersede all other aspects of human affairs. They see the world divided between the world of Islam and the world of unbelievers. Their ultimate ambition is the expansion of the world of Islam as far as possible (Kepel, 2002). Taleban initially began with a local, exclusively Afghan, movement. Their ambition was confined to the creation of Islamic state confined within the Afghan territorial boundary. However, during the course of War in Afghanistan, Taleban has integrated into the global movement of salafists or wahabists with a strong bond to Al Qaeda (Nojumi, 2008; Rashid, 2000).

Taleban has its root in refugee camps in Pakistan. Owing to the Soviet-Afghan War and successive Afghan Civil War in the first half of 1990s, a large flow of refugees repositioned themselves to refugee camps in Pakistan. Many of them are wartime orphans. These war-stricken young people got educated in madrassas where strong

Deobandi fundamentalist thoughts dominated. Thus, these young people were radicalized detached from their own Afghan traditions and customs (Nojumi, 2008; Shahrani, 2008).

Due to this ideological tie to Pakistan, Taleban has its stronghold in the Southern Afghanistan and Pakistan tribal areas. During the mid-1990s, their military expedition began from the Southern Afghanistan and marched northward to Kabul to build the Taleban regime. Since the fall of the regime in 2001, their withdrawal path was opposite. They receded into the Southern Afghanistan and Pakistan tribal areas from Kabul (Nojumi, 2008; Shahrani, 2008).

3) A factor of Pakistan

Pakistan is an important factor to understand Afghan terrorism. During the Soviet-Afghan war, Pakistan served as a strategic backyard supporting weapons, fighters, money, training, religious preaching, and safe haven for mujahedeen fighters. This earliest connection between Pakistan and Afghan warriors later became a nurturing ground for the Afghan insurgency later (Elias, 2007).

Pakistan impacted on the development and persistency of Taleban insurgency. Initially Pakistani regime trained and nurtured the growth of Taleban and critically assisted the establishment of the Taleban regime in the 1990s through the operation of ISI (Inter-Service Intelligence) (Elias, 2007). Pakistan also served as recruiting and training ground for Islamic insurgency fighters. Madrassas in Pakistan played central roles. Islamic extremism was taught and terrorist or combat training was provided. Also many Afghan youngsters and foreign volunteers from various Muslim countries were connected to Insurgency fighting groups through this recruiting channel (Nojumi, 2008). Pashtun tribal villages and towns across tribal areas in Pakistan served as safe havens or hideouts and logistic supply points. These towns and villages are mostly immune from the reach of Pakistani authority. Once the Afghan insurgency fighters merged among villagers, it is difficult to sort them out (International Crisis Group, 2006). In addition, various sunni- Islamic terrorist groups with Pakistani origin provide alliance, connection, and support to the Afghan terrorists. These groups include Pakistani

Taleban, Lashkar e Taiba, and Harakat ul Mujahedeen (Bajoria, 2010).

Owing to the sum of those various advantages Pakistan provides, Taleban terrorists could use Pakistan as the launching point of their terrorist attacks and operations in Afghanistan. Also, Pakistan served as safe havens or hideouts from the offense of the U.S. and ISAF forces and the Afghan government and provided logistic supplies (Kilcullen, 2009).

4) Taleban strategy

Taleban adopted asymmetric strategy different from the conventional fight. They do not focus on the direct fire-fight with the coalition forces. Rather, their strategy is to avoid fire-fight with the coalition forces, exhaust time, obtain political power of tribal villages and towns in countryside, and disrupt the Nation-State building in Afghanistan (Afsar, Samples, & Wood, 2008). For these aims, Taleban terrorizes local villagers and town people. It tried to create the image of disruption, crisis, and disorder. It also constructs and operates secrete parallel governing system corresponding to the formal Afghan governing system appointed by the Karzai regime. In combination of these various asymmetric methods, Taleban eventually attempts to push trial villagers and town people to seek security protection and governing service to Taleban insurgency instead the Kabul regime and thus to earn legitimacy and authority from these people in countryside (Kilcullen, 2009).

3. Theoretical ground: Rational Choice Theory

Rational choice theory has developed out of the utilitarian concept, that is, individuals are rational beings who maximize the pleasure and minimize the pain in order to serve their self-interest. Such utilitarian philosophy is often expressed in contemporary rational choice theories in combination with economic perspectives. In this perspective, offenders frequently calculate the benefits and the costs before choosing an option that offers the greatest benefit and lowest cost among a set of alternatives (Clark & Cornish, 1986). In other words, the rational choice perspective suggests that offenders calculate

the possibility of success before engaging in crime and, if the costs of involving in criminal activity over the benefits for non-criminal actions, the criminal activities will be decreased or deterred (Dugan, LaFree, & Piquero, 2005). In terms of street crime such as robbery, burglary, and other types of violent crimes, rational choice perspectives focus largely on the function of official sanction on street crime by suggesting that crime can be deterred through the appropriate public policy (Enders & Sandler, 1999; Ross, 1993; Dugan et al., 2005).

It is important to know whether contemporary rational choice theorists consider terrorists are the same rational beings just like common street criminals. Recent studies show that the rational choice perspective also sees that terrorists are rational, as they calculate the possibility of maximizing their achievement while minimizing their risk (see Sandler, Tschirhar & Cauley, 1983). Likewise, recent researches have applied rational choice theory to understanding of the phenomenon of terrorism and counterterrorism polices (Dugan et al., 2005; Kenney, 2003; Korte, 2005; Nevin, 2003). Dugan et al. (2005) tested rational choice theory by examining hijacking incidents, including terrorism motivated hijacking. They found a support for the rational choice perspective in that new airline hijacking attempts decreased when the perceived likelihood of success was reduced. They also found that the perceived costs of hijacking increased when the severity of punishment and the certainty of apprehension increased (Dugan et al., 2005).

Rational choice perspectives suggest that policy makers could alter terrorists' calculation of benefits and costs through policy focusing on deterrence (Kenney, 2003; Korte, 2005; Mendes, 2004; Nevin, 2003). Regarding perceived cost, Mendes (2004) also suggests that the probability of arrest, and conviction, as well as the severity of punishment have an impact on the choice of committing acts of terrorism. Similarly, perceived costs include the threat of injury or death and the possibility of being captured, tortured, or imprisoned (Korte, 2005). Kenney (2003) found that governmental military operation or raid on a specific terrorist group may lead to the decrease of the group membership. Nevin (2003) also argued that coercive counterterrorism policy increases perceived costs of participating in terrorist activities and leads to prevent terrorist groups from new recruitment.

However, an empirical analysis of terrorism conducted by Dugan et al. (2005) found that policy interventions that increased the perceived costs of hijacking were only effective in decreasing the likelihood of non-terrorist related hijacking. This finding implies a limitation of contemporary rational choice research in terms of understanding terrorists' decisions to participate in terrorism. It can be explained that group factors in association with terrorism, such as politicization, motivation, and/or overall level of ideological commitment to the group may mediate cost and benefit decisions by terrorist groups in different ways from that of street criminals.

Most importantly, a couple of recent study utilizing spatial data analysis technique adopted this rational choice perspective in explaining the risk of terrorism activities. Murphy (2003) identified types of spaces in the context of terrorism research: activity spaces, policy spaces, and perceptual spaces. In particular, he discussed that perceptual space, which refers to assess how place is perceived, can be more important than the actual function of space. For example, territory in the United States or the Western countries is an important perceived space for invasion for terrorists group like al Qaeda. Walmsley and Lewis (1993) also emphasized the point of view that underlies much of location theory where rational human beings are presumed to follow economic motives that lead them to act in a certain way: for example, minimize costs or maximize profit in a given environment. As such, rational choice perspective linked to certain location theory which explains why we move in space the way we do. On the basis of such spatial models, particularly gravity models, which widely applied to research in urban and economic geography, Kliot and Charney (2006) analyzed suicide terrorism in Israel. The study found that several geographical variables such as accessibility, visibility, mobility, availability, distance and accessibility, the geographical bases of terrorism, and the cities as a vulnerable area for terrorism are also predictors for assessing the risk of terrorism in Israel.

Berrebi and Lakdawalla (2007) examined whether certain empirical determinants which may reduce the cost of terrorism activities linked to the increased risk of terrorism in certain spatial areas. For example, they found that proximity of home-bases of terrorists groups to the targets is an important marker for terrorism risk: A locality

that is 1 km farther from terrorist home-base faces 3 percent lower risk of having been attacked and a 0.5 percentage point reduction in the probability of having been attacked (Berrebi & Lakdawalla, 2007, p.120). That is, the proximity of home-base of a terrorist group to a target locality improved accessibility of terrorists to the targets may reduce the costs of terrorism attacks. In turn, it had positive impact on the increase of various types of terrorism activities in Israel. This fact implies that travel costs matter in economically and it is also related with the risk of arrests by police or military. The locality which near to the border of other county was another factor increased the risk of bombing incidence. The accessibility of border to other county makes terrorists easy to escape from capturing by the police and military. Also, they found that population of a locality has a positive relationship with the risk of terrorism events in Israel.

In sum, those previous empirical studies provide some evidence that the rational choice perspectives suggest that terrorists groups also assess the costs and benefits before conducting terrorist activities. However, the current stage of the research still needs more empirical research especially which applied spatial data analysis which is an appropriate technique to examine the impact of spatial characteristics on the terrorists' rational thinking process.

Ⅲ. Research Method

1. Hypothesis

The main hypothesis of this study follows the principle of rational choice theory. Terrorists calculate costs and benefits. If distance between potential bombing targets and their home-base increases, bombing attacks less likely occur vice versa, because the increase of distance means the increase of cost for the execution of bombing attack. Thus, we can see that bombing attacks are not randomly distributed but rather concentrated closer to the home-base of terrorists. Based on the informed knowledge on the home-base of Taleban terrorists illustrated in the literature review of this paper,

terrorists' home-base is assumed to be located in the Pashtun tribal area in the Southern Afghanistan and Pakistan tribal area just across the Afghanistan-Pakistan border. Meanwhile, according to the same logic of rational choice perspective, large cities as the center of population, politics, business, religion, economy, and social activities are more likely attacked by bombing attacks simply because terrorists can anticipate greater benefit from attack. A single attack can kill more number of people, greatly disrupt daily life and normal operation, more terrorize government, foreigners, business, and population.

In short, this study hypothesizes that 1) the bombing attacks will not be evenly or randomly distributed but distributed with a certain identifiable pattern; 2) the bombing attacks will be positively associated with the accessibility of the locality if it is easy or close to terrorist home-bases; and 3) the bombing attacks are more likely to be concentrated in large cities with greater number of population and greater intensity of political, economic, and social activities. These hypotheses are accorded with a rational choice model that emphasizes the costs and benefits of target selection.

2. Data

Data used for this study are derived from a portion of the database on terrorism incidents worldwide collected by the Institute for the Study of Violent Groups (ISVG) at Sam Houston State University. ISVG is a terrorism research institute working to build a comprehensive terrorism database. Its goal is to develop a relational database by analyzing open source information on domestic and international terrorist groups. Open sources include thirteen specific categories of sources: books, broadcast transcripts, court documents, datasets, FBIS(Foreign Broadcasting Information System), government reports, journals, magazines, mailing lists, NGO reports, newspapers, websites, and wire reports. ISVG collected terrorist incidents in various types of terrorist activities including bombings, hostage taking, armed assaults etc. This study uses terrorist bombing attack incidents having occurred in the Afghanistan (See ISVG, 2005).

Another data used for this study is geographical layer data which divides up the

Afghanistan into regions, provinces, cities, and local areas. The geographical locations in the shape files that downloaded from the <http://www.diva-gis.org/gData> website divided up the country into various localities according to their administrative boundaries and tribal areas. For the most part, each locality is defined by the presence of a single major city that holds administrative sway over the space of the locality. Each locality is constructed as a polygon on the map of Afghanistan. Then the researcher will assign each bombing attack in the ISVG database to one of these localities,

according to whether it fell within the polygon on the map. Since the ISVG data has only city or county level of location information where bombing incidents by terrorists groups occurred, the researcher will assume the attack was located at the central point of the mapping polygon containing the city or the county.

3. Analysis strategy

For the analysis of this study, first, the geographic data will be summarized to provide a general description of the types of localities in the geographic coding scheme. Second, this project will visualize the bombing incidence density and the results of the incidences to analyze how terrorism incidents vary across space. For the risk analysis, the researcher will construct a risk map which depicting terrorist “hot spots” and “cool spots” across the country as Berribi and Lakadwalla (2007) used in their analysis of risk of attacks in Israel (see Berribi & Lakadwalla, 2007, p.123-125). Using Arcmap, the researcher will construct the map by taking the estimated risk of bombing attacks for each map ‘polygon’ and smoothing this risk across space, so that spatial risk varies continuously as Berribi and Lakadwalla (2007, p.123) have used in their analysis. This map will be expected to demonstrate the high risk cities or counties and the gradual variation of risk across space. For example, it is expected that cities and counties close to home-base of Taleban terrorist groups will show higher bombing attack risk. Also, cities and counties such as in the Pashtun tribal provinces, border areas, and the location of high population and administrative or business centers are expected to have elevated risk of bombing attacks by terrorists groups. Next, the researcher will make a figure which

estimates distance decay patterns from a home-base of Taleban terrorist group to the bombing incidence areas. In this spatial analysis, the major consideration is the distance from the home-base of a terrorist group and the bombing target locations. This type of technique used by Killot and Charney (2006) when examining the suicide terrorism in Israel. Using Arcmap, the researcher will estimate the distance between the terrorist home-base and each bombed locations, city or county, with the number of bombing incidents in that areas.

IV. Analysis and Discussion

GIS analysis was conducted separately on five different analysis targets. In order to uncover characteristics and dynamics of terrorist bombing in Afghanistan, the analysis was conducted in five different ways and produced five different maps of analysis results. For the examination of the research hypothesis with clearer graphic, Pakistan map with showing different provincial areas was attached to the map of bombing analysis in Afghanistan. Pakistan tribal areas include FATA(Federally Administered Tribal Area), North Waziristan, and South Waziristan where Pashtun tribal societies dominate and thus Pakistani central government has little authority or legitimacy over these regions (Afsar, Samples, & Wood, 2008; Tellis, 2008). The mainly Pashtun tribes that inhabit the areas are fiercely independent from the Pakistani central government (Tellis, 2008). Also Quetta and Zhob provinces which are also bordering on Afghanistan and located in the further south of FATA are considered as Pashtun tribal areas within Pakistan. Quetta was historically part of the Pashtun-dominated Hotaki and Durrani Empire and the city of Quetta in general is dominated by Pashtun people. Similarly the vast majority of the population of Zhob district is Pashtun (See www.findpk.com; <http://forum.urduworld.com>).

〈Table 1〉 Terrorist bombing attacks in Afghanistan

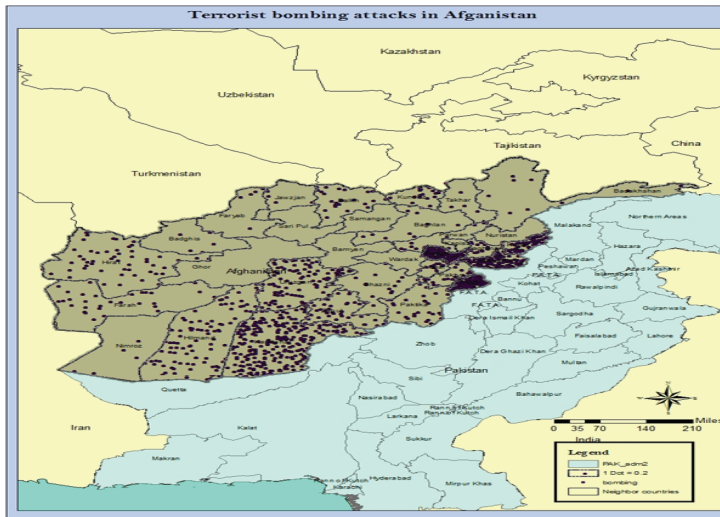
Province	Number of bombings
Kandahar	57
Kabul	36
Khost	31
Nangarhar	24
Uruzgan	21
Hilmand	18
Kunar	14
Hirat	11
Other provinces	9 or less
Total	268

〈Table 1〉. shows the distribution of terrorist bombing attacks occurred in Afghanistan. Also, the 〈Fig. 1〉. below shows the provinces of Afghanistan. By comparing the 〈Table 1〉 with the 〈Fig. 1〉, we can see that most bombing-attacked provinces are located near Afgan-Pakistan border and also Pashtun tribal areas in Pakistan. Kandahar, Khost (or Khowst), Nangarhar, Hilmand (or Helmand), and Kunar (or Konar) are directly bordering on Pakistan. Kabul and Uruzgan (or Oruzgan) are provinces detached from the Afghan-Pakistan border but have proximity to the border. Only Hirat (or Heart) can be considered as a remote province distant from the Afghan-Pakistan border. Also, the top seven most frequently attacked provinces in the list can be considered as Pashtun dominating area within Afghanistan. Only Hirat can be counted as non-Pashtun province which scored more than ten bombing attacks. Based on the descriptive results, we can contend that most terrorist bombing attacks in Afghanistan occurred in the southern border provinces of Afghanistan which has Pashtun-dominating population and near Pashtun dominating tribal areas in Pakistan.



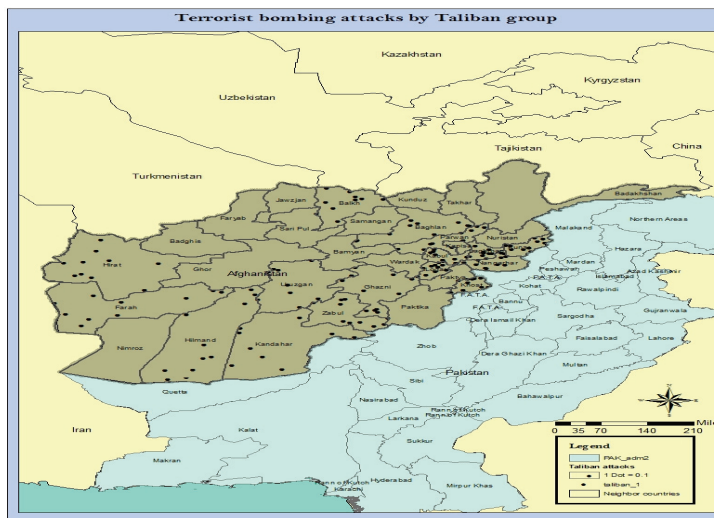
Source: www.mapsofworld.com/afghanistan/

〈Fig. 1〉 Political Map of Afghanistan



〈Fig. 2〉 Terrorist bombing attacks in Afghanistan

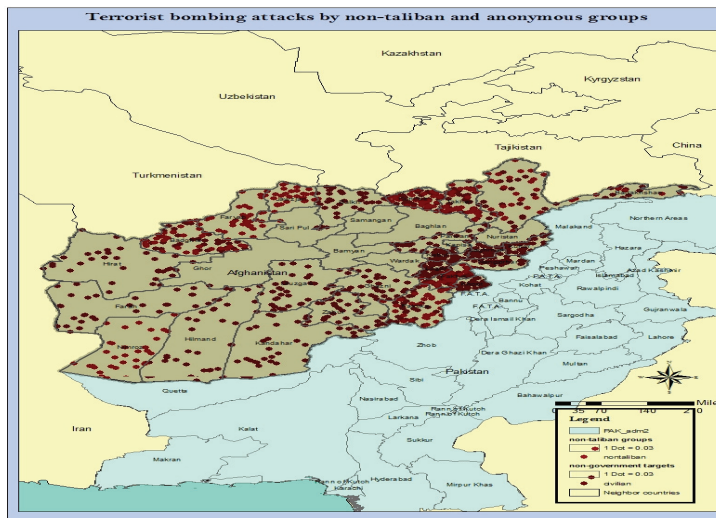
<Fig. 2> shows the result of GIS analysis on terrorist bombing attacks in Afghanistan. Dots represent bombing-attacks and thus more concentrated dots represent the more bombing attacks densely located and thus considered as hot-spots. The Graphical representation shows that most bombing attacks occurred and were concentrated in the southern border provinces where the Pashtun tribal identity dominates. We can see the two hot-spots in these border areas. The one is Kabul-Khost-Nangarhar spot near FATA area in Pakistan and the other is Kandahar-Uruzgan-Hilmand spot near Quetta area in Pakistan.



<Fig. 3> Terrorist bombing attacks by Taliban group

<Fig. 3 and 4> shows an interesting finding. <Fig. 3> is the GIS analysis result of bombing attacks where Taleban was overtly identified as offender, while <Fig. 4> is the result of attacks where no offender was identified or non-Taliban groups were perpetrator. <Fig. 3> shows that most Taleban attacks occurred and even more concentrated in the southern border provinces where Pashtun tribal identity dominates. By contrast, <Fig. 4> shows that non-Taleban or anonymous attacks are rather evenly concentrated in two remotely separated border provinces: the southern border areas and

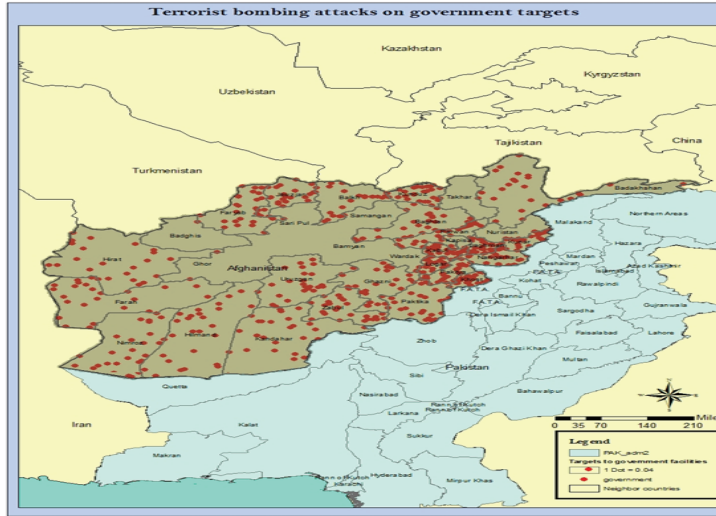
the northern border areas. These northern border provinces are known as non-Pashtun area where other ethnic groups or tribal groups, such as Tajiks and Uzbeks, dominate (Afsar, Samples, & Wood, 2008). By combing two results of GIS analysis, the current study supports that Taleban attacks are mostly concentrated in the southern Pashtun-dominating provinces. Also, most non-Taleban attacks and anonymous attacks occurring in the southern provinces may be connected to Pashtun identity or associated with Taleban nature. By contrast, most bombing attacks occurring in the non-Pashtun provinces especially in the Northern provinces may be irrelevant to Taleban cause or Pashtun identity.



<Fig. 4> Terrorist bombing attacks by non-Taliban & anonymous groups

There was no identifiable difference found regarding the characteristics of bombing-target. GIS analysis was conducted on different characteristics of bombing targets: the governmental targets and the non-governmental targets. <Fig. 5 and 6> below show the geographical distribution of locations of bombing targets for governmental targets and non-governmental targets. No meaningful difference was found and thus it can be contended that the nature of target has no significant meaning

for terrorist bombing attacks in Afghanistan regarding geographical distribution of bombing attacks.



〈Fig. 5〉 Terrorist bombing attacks on governmental targets

V. Conclusion, Limitation, and Suggestions

The findings of this study show that hypothesis of the current research is supported by the empirical evidence of GIS (Geographical Information System) analysis. Upon the analysis, terrorist bombing attacks in Afghanistan, first of all, were not randomly distributed but distributed with a certain identifiable pattern. Locations of bombing attacks were more likely to be concentrated in the southern provinces of Afghanistan near Afghanistan-Pakistan border where Pashtun tribal entities were heavily populated.

Secondly, the bombing attacks were positively associated with the accessibility of the locality if it is easy or close to terrorist home-bases. Taliban group has been known to have its home-base inside the southern provinces of Pashtun dominating area of Afghanistan and/or FATA (Federally Administered Tribal Area) and Quetta of Pakistan where is also dominated by Pashtun tribal societies. Certainly geographical distributional

patterns of bombing sites show the fact that ease and distance plays in terrorists' decision-making process of selecting targets. Closer targets from its home-base were more likely to be targeted by Taleban terrorists because they are easy to access and less costly to attack. In this context, it can be argued that Taleban terrorists engage in rational calculation of cost-benefit analysis and geographical proximity is an important contributing factor of the rational decision-making process. The conclusion can be strengthened by the result of <Fig. 3>. comparing to that of <Fig. 4>.

Lastly, Hypothesis 3 was only indirectly and thus less sufficiently supported by the research findings. Unfortunately due to the limitation of the data, the exact location of city for bombing attack was not available for a substantial number of incidents. Thus, Hypothesis 3 was only indirectly conjectured by the data-analysis. Nevertheless, as seen in the <Table 1>, two most frequently attacked locations were Kandahar (57) and Kabul (36) where two most politically, economically, and socially important cities and also two most important population centers are located (Kandahar and Kabul respectively). Combined together, approximately the 35 percent of all bombing incidents in the data was concentrated in these two areas. Although not all incidents occurring in these two provinces can be said to happen in the cities of Kandahar and Kabul, it can be safely conjectured that a substantial amount of attacks possibly targeted within the cities. But, this matter should be clarified by future research.

Finally it is fair to point out limitations of the current study. First of all, the data used here is inadequate because it was collected from open-sources only. Not all incidents can be possibly captured in the data-collection process. Accordingly, all bombing incidents during the time-span only represent bombing cases that could be possibly collected by collectors' best efforts based on the utilization of open sources publicly available. Thus, the limitation of the data itself impairs the findings of this research. Also, the current GIS analysis has a descriptive nature and thus a more inside and hidden dynamic of terrorist bombing attacks may not be captured in the current study. Thus, this limitation of research methodology may be possibly related to insufficient conclusion of this study. But, the current research can be a step-stone for a more sophisticated analysis for a next step. Negative binomial analysis of bombing

incidents can be considered as the next step after this study.

Despite those addressed pitfalls, this research seems a certain merit by showing the nature of terrorist bombing attacks of Afghanistan. A geographical distributional pattern was uncovered, the dynamics of relationship between terrorists' rational calculation and geographical proximity was captured, and terrorists' preference of target selection regarding city-centers was partially supported. Those findings may serve the purpose of counterterrorism prevention and policies.

Finally, this study has certain merits for the government and academics in Korea. For the Korean government, it can be used as an policy guidelines. A growing number of Korean civilians and governmental officials reside, work, or travel overseas. Some of them, from time to time, fell into victims of terrorist or criminal attacks. Some can be kidnapped or victims of terrorist bombing attacks. Also many Korean companies invest or do business in many poor security and high risk regions such as Afghanistan. Responding to this situation, the Korean government certainly has a responsibility to provide security consultations and measures for these companies, civilians, and government officials overseas. This kind of analysis report can provide an worthy intelligence for the Korean government to develop counterterrorism measures for the benefit of civilians and government employees working or residing overseas.

For the academics in Korea, the current study may positively affect on more active research and knowledge building. A great majority of terrorism studies in Korea thus far have been qualitative introduction of systems and policy measures of other countries or a mere speculations of future prediction. More serious quantitative data analysis or practical research on real cases are needed to enrich the field of terrorism study in Korea. In this regards, the current study may serve as a good reference for this kind of more analytic and empirical research.

참고문헌

- Afsar, Shahid, Samples, Chris., and Wood, Thomas. (2008). The Taliban: An Organizational Analysis. *Military Review*. Available at: <http://handle.dtic.mil/100.2/ADA485136>.
- Bajoria, Jayshree. (2010). Pakistan's New Generation of Terrorists. *Council on Foreign Relations*. Available at: http://www.cfr.org/pakistan/pakistans-new-generation-terrorists/p15422?cid=rss-analysisbriefbackgroundundersexp-pakistan_s.
- Berrebi, C. and Lakdawalla, D. (2007). How does terrorism risk vary across space and time? An analysis based on the Israeli experience. *Defense and Peace Economics*, 18: 113-131.
- Canfield, Robert L. (2008). Fraternity, Power, and Time in Central Asia. In Robert D. Crews and Amin Tarzi. (eds.). *The Taliban and the crisis of Afghanistan*. (pp. 212-237). Cambridge, MA: Harvard University Press.
- Clark, Ronald. V. and Cornish, Derek. B. (1986). *The Reasoning Criminal*. New York: Springer Verlag.
- Dugan, L., LaFree, G., and Piquero, A. R. (2005). Testing a Rational Choice Model of Airline Hijackings. Paper presented at the American Society of Criminology meeting in Nashville, November 2004. Revised July, 2005.
- Elias, Barbara. (2007). Pakistan: "The Taliban's Godfather"? *National Security Archive Electronic Briefing Book No. 227*. Available at: <http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB227/index.htm>.
- Enders and Sandler. (1999). Transnational Terrorism in the Post-Cold War Era. *International Studies Quarterly*, 43:145-167.
- Faiez, Rahim. (2011, March 20). *Afghan alert over spring terror attacks*. Available at: <http://scotlandonsunday.scotsman.com/afghanistan/Afghan-alert-over-spring-terror.6737088.jp?articlepage=1>
- Gunaratna, Rohan and Nielsen, Anders. (2008). Al Qaeda in the tribal areas of Pakistan and beyond," *Studies in Conflict & Terrorism*, vol. 31, no. 9: 775-807.
- International Crisis Group. (2006). Pakistan's tribal areas: Appeasing the militants. *Asia Report* No125.
- ISVG (Institute for the Study of Violent Groups). (2005). *Relational database codebook*. Huntsville, TX: College of Criminal Justice, Sam Houston State University.

- ISVG (Institute for the Study of Violent Groups). (2006). *Extremist Groups: An International Compilation of Terrorist Organizations, Violent Political Groups, and Issue-Oriented Militant Movements*. (3rd ed.). Huntsville, TX: Office of International Criminal Justice.
- Kaplan, R. D. (2005). *Imperial grunts: on the ground with the American military, from Mongolia to the Philippines to Iraq and beyond*. New York: Random House Publishing Group.
- Kenney, M. (2003). From Pablo to Osama: Counter-terrorism Lessons from the War on Drugs. *Survival*, 45(3):187-206.
- Kepel, Gilles. (2002). *Jihad: The trail of political Islam*. Cambridge, MA: Harvard University Press.
- Kilcullen, David. (2009). *The Accidental Guerrilla: Fighting Small Wars in the Midst of a Big One*. New York: Oxford University Press.
- Killot, N. and Charney, I. (2006). The geography of suicide terrorism in Israel. *Geo Journal*, 66: 353-373.
- Korte, R. N. (2005). Is Counter Terrorism Counterproductive?: The Case of Northern Ireland. Unpublished Master's thesis. University of Maryland at College Park.
- Meinecke, Friedrich. (2007). *Weltburgertum und Nationalstaat (Cosmopolitanism and Nation State)*. Pajoo, South Korea: Nanam. (Translated in Korean).
- Mendes, S. R. (2004). Certainty, Severity, and Their Relative Deterrent Effects: Questioning the Implications of the Pole of Risk in Criminal Deterrence Policy. *The Policy Studies Journal*, 32(1):59-74.
- Murphy, A. (2003). *The space of terror*. In S. Cutter, D. Richardson, and Thomas Wilbanks (eds.), The geographical dimensions of terrorism (pp. 47-52). New York: Routledge.
- Nevin, J. A. (2003). Retaliating against terrorists. *Behavior and Social Issues*, 12: 109-128. Official Paper of the Turkish Republic, no24841.
- Nojumi, Neamatollah. (2008). The Rise and Fall of the Taliban. In Robert D. Crews and Amin Tarzi. (eds.). *The Taliban and the crisis of Afghanistan*. Cambridge, MA: Harvard University Press., 2008.
- Rashid Ahmed. (2000). *Taliban*. New Haven, CT: Yale University Press.
- Rashid, Ahmed. (2002). *Jihad: the rise of militant Islam in central Asia*. New York: Penguin Books.
- Renan, Ernest. (2002). *Qu'est ce que'une nation (What is nation?)*. Seoul: Chae Saesang. (Translated in Korean).
- Roggio, Bill. (2011). 17 Taliban, 'foreign fighters' killed during hunt for al Qaeda commander in Kunar. *The Long War Journal*. Available at: http://www.longwarjournal.org/archives/2011/04/17_taliban_foreign_f.php.
- Rohde, David. (2007). Foreign Fighters of Harsher Bent Bolster Taliban. *The New York Times*.

- Available at: http://www.longvarjournal.org/archives/2011/04/17_taliban_foreign_f.php.
- Ross, J. I. (1993). Structural Causes of Oppositional Political Terrorism: Towards a Causal Model. *Journal of Peace Research*, 30(3):317-329.
- Rzehak, L. (2008). Remembering the Taliban. In R. D. Crews and A. Tarzi. (eds.). *The Taliban and the crisis of Afghanistan*. (pp. 182-211). Cambridge, MA: Harvard University Press.
- Sandler, T., Tschirhar, J.T., and Cauley, J. (1983). A Theoretical Analysis of Transnational Terrorism. *The American Political Science Review*, 77: 36-77.
- Shahrani, M. Nazif. (2008). Taliban and Talibanism in Historical Perspective. In Robert D. Crews and Amin Tarzi. (eds.). *The Taliban and the crisis of Afghanistan*. (pp. 155-181). Cambridge, MA: Harvard University Press.
- Shultz, Richard H. and Dew, Andrea J. (2006). *Insurgents, terrorists, and militants*, New York: Columbia University Press.
- Sinno, Abdulkader. (2008). Explaining the Taliban's Ability to Mobilize the Pashtuns. In Robert D. Crews and Amin Tarzi. (eds.). *The Taliban and the crisis of Afghanistan*. (pp. 59-89). Cambridge, MA: Harvard University Press.
- Taras, R. C. and Ganguly, R. (2008). *Understanding ethnic conflict: the international dimension*. (3rded.). New York: Pearson Longman.
- Tellis, Ashley. J. (2008). Pakistan and the War on Terror: Conflicted Goals, Compromised Performance. Washington D. C.: Carnegie Endowment For International Peace.
- Tarzi, Amin. (2008). The neo-Taliban. In Robert D. Crews and Amin Tarzi. (eds.). *The Taliban and the crisis of Afghanistan*. (pp. 274-310). Cambridge, MA: Harvard University Press.
- Walmsey, D. J. and Lewis, G. J. (1993). People and environment - Behavioral approaches in human geography. Burnt Mill, Longman.
- Yun, Minwoo. (2009). Application of SCP (Situational Crime Prevention) to terrorist hostage taking and kidnapping: A case study of 23 Korean hostages in Afghanistan. In Joshua Freilich and Graeme R. Newman. (eds.). *Countering Terrorism through Situational Crime Prevention (Crime Prevention Studies, Volume 25)*. (pp. 111-139). St. Louis, MO: Willow Tree Press, Inc.

Websites:

- www.findpk.com
<http://forum.urduworld.com>
www.mapsofworld.com

【Abstract】

Geospatial analysis of terrorist bombing attacks in Afghanistan

Yun, Min-Woo

Since the launch of Operation Enduring Freedom in 2001, Afghanistan has been a critical battle ground for war against global terrorism. For the last 10 years, the U.S. government and its allies and the Afghan government have put a considerable effort to crush terrorists and insurgents and at the same time to construct nationwide governance system. Yet, the noble mission still seems far from complete. Terrorist or insurgent operations in Afghanistan are still active and troublesome. Thus this subject continues to draw a considerable attention of research or investigative reports to grasp an insightful knowledge or intelligence that may allow a better handling of terrorist troubles in this war-torn nation.

This study hopes to serve this purpose by providing analyzed information on terrorist bombings in Afghanistan occurred between 2004 and 2007. It adopts GIS (Geographic information System) analysis technique to uncover spatially patterned aspects of terrorist bombing attacks in Afghanistan. The specific focus of this study is to examine whether terrorists behave rationally when they decide which targets to attack. For analysis, this study will focus on examining whether characteristics of localities have certain impact on the risk of being targets of terrorist bombing attacks. To examine the hypothesis of this study, it will explore how the spatial risk of becoming targets of terrorist bombing attack interacts with cost necessary for executing attack paid by terrorists; 1) by demonstrating the spatial distribution of bombing attacks in Afghanistan and 2) by estimating the distance between headquarters (or home base) of terrorists groups and the bombed target area.

**Key words : Geospatial analysis, Terrorist bombing attacks, Terrorism,
Insurgency, Afghanistan**