

# Visualization Study of Terrorist Organizations in Asia Based on UCINET

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## ABSTRACT

Until 2020, the threat of international terrorist activities still not diminish, extremists accelerated their flight from the Middle East to many countries in Asia and Africa, and terrorist forces around China became extremely active, thus impacting on regional security. Therefore, the analysis of the development trend and characteristics of terrorist organizations in Asia is of great significance to the fight against terrorism in China. This paper analyzes the density and centrality of "terrorist organization-organization" and "terrorist organization-area of operation" networks in Asia by using UCINET based on the social network analysis method. The characteristics of the networked structure of terrorist organizations, the diversification of participants' backgrounds, the increase in regional connectivity and the improvement of organizational planning capabilities were identified, and corresponding strategies were proposed as the theoretical support for counter-terrorism.

**Keywords:** Asia region, Social network analysis, Fight against terrorism, UCINET.

## 1. INTRODUCTION

Since the beginning of the 21st century, terrorism, one of the non-traditional security threats that the international community is focusing on, has shifted from the previous vertical command to a fragmented terrorist network. Traditional research methods are no longer sufficient to meet our requirements, and the search for rational and effective methods has become the goal of sociologists [1]. This method has been widely used after 9.11 when it was found that social network analysis is important to study the field of counter-terrorism. In this paper, the social network theory is used to study terrorist organizations in Asia, and UCINET is used to analyze the relationship network of terrorist organizations, to obtain their development characteristics and to develop new counter-terrorism strategies based on the conclusions, and to contribute ideas and methods to the fight against terrorism.

## 2. BUILDING A NETWORK OF TERRORIST ORGANIZATIONS IN ASIA

### 2.1. Research Methodology

Social network analysis is a quantitative analysis method developed based on mathematical methods, graph theory, and so on. Although it has been used in research as early as 1981 by Bonnie Erikson [2], it was widely used in the field of counter-terrorism after Valdis Krebs produced models for analyzing terrorist networks [3]. The main indicators of analysis are density and centrality.

### 2.2. Data Sources

The data in this paper is mainly derived from the 108 terrorist organizations on the latest UN sanctions list published on the official UN website in 2020, and with reference to the lists of terrorist organizations designated by major countries and international organizations as of 2019[4], the following 116 major terrorist organizations in the Asian region are obtained.

Code	Terrorist organization	Code	Terrorist organization	Code	Terrorist organization	Code	Terrorist organization
M1	Abu Sayyaf Group	M40	Palestinian Islamic Army	M79	Benevolence International Foundation	M103	Sharm Free People
M2	Aum Shinrikyo	M41	Islamic State of Bangladesh	M80	Moroccan Islamic Fighting Group	M104	Islamic Army of Iraq
M3	Hamas	M42	Islamic State Philippines Branch	M81	East Turkestan liberation organization	M105	the Ansars Senna army
M4	Mujahideen movement	M43	Loyalist Army	M82	World Uyghur Youth Congress	M106	Islamic Resistance Front of Iraq
M5	Lebanese Hezbollah	M44	Islamic Jihad	M83	ETIC	M107	mujahideen
M6	PKK	M45	Raja Suleiman Movement	M84	Democratic Front for the Liberation of Palestine	M108	Yemeni Islamic Jihad
M7	PLF	M46	Front Populaire pour la Nouvelle Victoire in the Levant	M85	PRC	M109	Abu AS Al-Sai Brigade
M8	Palestinian Islamic Jihad	M47	Al-Haramain Foundation, Afghanistan Chapter	M86	Zayed Geraha detachment	M110	Young Believers
M9	PFLP	M48	Migrants and Supporters Army	M87	Jewish Federations	M111	Hizb ut-Tahrir
M10	Popular Front for the Liberation of Palestine- General Command	M49	Tariq Gidhar Organization	M88	LTTE	M112	Hezbollah
M11	Al-Qaida	M50	Akhtar International Trust	M89	Revolutionary People's Liberation Party-Front	M113	Union of Revolutionary Communists of Turkey
M12	Islamic Movement of Uzbekistan	M51	Indonesian Red Crescent Society	M90	Bangladesh Islamic Jihad Movement	M114	Ergnet hole
M13	Mohammedan army (Iraq)	M52	Rashid Trust Company	M91	Nagesh Bandy Army	M115	Gray Wolves
M14	Al-Aqsa Martyrs' Brigade	M53	Society for the Revitalization of Islamic Heritage	M92	Islamist party	M116	Kurdish Free Life Party
M15	Ansar Alliance	M54	Afghanistan Support Committee	M93	Abu Nidal Organization		
M16	Jemaah Islamiyah	M55	Afghan Service Authority	M94	Viet Nam's renewal revolution		
M17	Lashkar-e-Jhangvi	M56	Al-Haramain Foundation (Pakistan)	M95	Hezbollah Brigades		
M18	Islamic Jihad	M57	Al-Haramain Foundation (Indonesia)	M96	MUTO		
M19	Al-Qaida in the Arabian Peninsula	M58	Al-Haramain Foundation (Bangladesh branch)	M97	Bangsamoro Islamic Freedom Fighters		
M20	Islamic Jihad Movement of Pakistan	M59	Rabita Trust	M98	FDD		
M21	Taliban	M60	Wafa Humanitarian Organization	M99	Rohingya Salvation Army		
M22	Almighty God's Brigade	M61	Association for Islamic Cooperation	M100	soldier of God		
M23	Hizb ut-Tahrir	M62	Muslim National Renaissance Organization	M101	FAG		
M24	Abdullah Azzam Brigade	M63	Al-Sham Islamic Movement	M102	Storm Eagle		
M25	Hagani Network	M64	Cossack Currency Exchange	M103	Sharm Free People		
M26	Jerusalem Jihad Shura Council	M65	Haini Fahad currency exchange	M104	Islamic Army of Iraq		
M27	Khorasan Province, Islamic State	M66	Gold Chain Exchangers	M105	the Ansars Senna army		
M28	Al-Qaida Indian subcontinent	M67	Khalid Ibn Walid's Army	M106	Islamic Resistance Front of Iraq		
M29	Ansar al-Islam	M68	Agga Warrior	M107	mujahideen		
M30	IAA	M69	Imadshi Bukhari Combat Battalion	M108	Yemeni Islamic Jihad		
M31	ISIS	M70	Islamic State -- Khorasan Province	M109	Abu AS Al-Sai Brigade		
M32	Libertarian Party	M71	guerrilla theocracy	M110	Young Believers		
M33	Jamaat-ul-Mujahideen Bangladesh	M72	Islamic State -- Yemen	M111	Hizb ut-Tahrir		
M34	East Indonesian Mujahideen	M73	Hiral Amar (Indonesia)	M112	Hezbollah		
M35	Friends of the Prophet Pakistan	M74	Hajjbasir and Zalqimir Hawara Corporation	M113	Union of Revolutionary Communists of Turkey		
M36	Campaign for the implementation of Islamic law	M75	Rahat Ltd.	M114	Ergnet hole		
M37	Kurdish Freedom Eagles	M76	Roshan Currency Exchange	M115	Gray Wolves		
M38	Al-Aqsa Foundation	M77	Haji Karura Haji Sattar currency exchange	M116	Kurdish Free Life Party		
M39	East Turkestan Islamic movement	M78	International Islamic Tour				

Figure 1 List of terrorist organizations.

### 2.3. Building a Matrix of Terrorist Relationships and Network Models

N1, N2, N3, N4 and N5 represent East, Southeast, Central, West and South Asia, and the following matrix and network models of terrorist "organization-organization" and "organization-region" relations in the Asian region have been constructed based on the data.

	M1	M2	M4	M5	...	M115	M116
M1	1	0	0	0	...	0	0
M2	0	1	0	0	...	0	0
M4	0	0	1	0	...	0	0
M5	0	0	0	1	...	0	0
...	...	...	...	...	...	...	...
M115	0	0	0	0	...	1	0
M116	0	0	0	0	...	0	1

Figure 2 Organizational-organizational.

	N1	N2	N3	N4	N5
M1	0	1	0	0	0
M2	1	0	0	0	0
M5	0	0	0	1	0
...	...	...	...	...	...
M115	0	0	0	1	0
M116	0	0	0	1	0

Figure 3 Organizational-territorial.

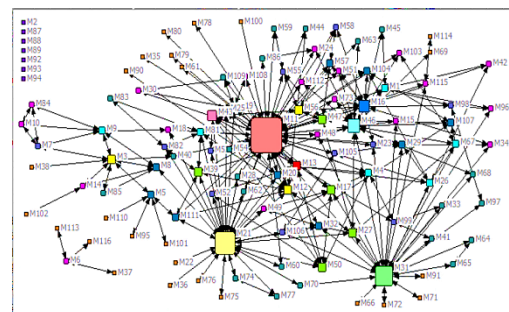


Figure 4 Organization – Organizational.

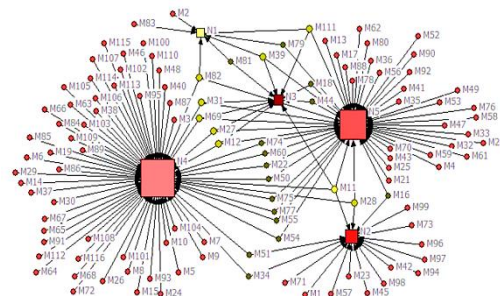


Figure 5 Organization - area of activity.

It can be seen from the figure that the network centered on M11 is the largest in the organizational network, while N4 is the most central in the "organization-area of activity" network, indicating that it is at the core of the network.

[illegible]

**Figure 6** Centrality of "organization-organization" relationship networks.

Degree Closeness Betweenne				M29	0.200	0.689	0.000	M59	0.200	0.623	0.000	M88	0.200	0.623	0.000
M1	0.200	0.526	0.000	M30	0.200	0.689	0.000	M60	0.200	0.867	0.021	M89	0.200	0.689	0.000
	0.200	0.483	0.000	M31	0.600	0.880	0.027	M61	0.200	0.623	0.000	M90	0.200	0.623	0.000
	0.200	0.689	0.000	M32	0.200	0.623	0.000	M62	0.200	0.623	0.000	M91	0.200	0.689	0.000
	0.200	0.623	0.000	M33	0.200	0.623	0.000	M63	0.200	0.689	0.000	M92	0.200	0.623	0.000
	0.200	0.689	0.000	M34	0.400	0.751	0.034	M64	0.200	0.689	0.000	M93	0.200	0.689	0.000
	0.200	0.689	0.000	M35	0.200	0.623	0.000	M65	0.200	0.689	0.000	M94	0.200	0.526	0.000
	0.200	0.689	0.000	M36	0.200	0.623	0.000	M66	0.200	0.689	0.000	M95	0.200	0.689	0.000
	0.200	0.689	0.000	M37	0.200	0.689	0.000	M67	0.200	0.689	0.000	M96	0.200	0.526	0.000
	0.200	0.689	0.000	M38	0.200	0.689	0.000	M68	0.200	0.689	0.000	M97	0.200	0.526	0.000
	0.200	0.689	0.000	M39	0.600	0.640	0.009	M69	0.600	0.880	0.027	M98	0.200	0.526	0.000
M10	0.200	0.689	0.000	M40	0.200	0.689	0.000	M70	0.200	0.623	0.000	M99	0.200	0.526	0.000
M11	0.800	0.975	0.101	M41	0.200	0.623	0.000	M71	0.200	0.526	0.000	M100	0.200	0.689	0.000
M12	0.600	0.880	0.027	M42	0.200	0.526	0.000	M72	0.200	0.689	0.000	M101	0.200	0.689	0.000
M13	0.200	0.623	0.000	M43	0.200	0.623	0.000	M73	0.200	0.526	0.000	M102	0.200	0.689	0.000
M14	0.200	0.689	0.000	M44	0.400	0.630	0.001	M74	0.400	0.867	0.021	M103	0.200	0.689	0.000
M15	0.200	0.689	0.000	M45	0.200	0.526	0.000	M75	0.400	0.867	0.021	M104	0.200	0.689	0.000
M16	0.400	0.677	0.031	M46	0.200	0.689	0.000	M76	0.200	0.623	0.000	M105	0.200	0.689	0.000
M17	0.200	0.623	0.000	M47	0.200	0.623	0.000	M77	0.400	0.867	0.021	M106	0.200	0.689	0.000
M18	0.400	0.630	0.001	M48	0.200	0.689	0.000	M78	0.200	0.623	0.000	M107	0.200	0.689	0.000
M19	0.200	0.689	0.000	M49	0.200	0.623	0.000	M79	0.400	0.637	0.007	M108	0.200	0.689	0.000
M20	0.200	0.623	0.000	M50	0.400	0.867	0.021	M80	0.600	0.623	0.000	M109	0.200	0.689	0.000
M21	0.200	0.623	0.000	M51	0.400	0.751	0.034	M81	0.400	0.526	0.000	M110	0.200	0.689	0.000
M22	0.400	0.867	0.021	M52	0.200	0.623	0.000	M82	0.600	0.894	0.061	M111	0.600	0.640	0.009
M23	0.200	0.526	0.000	M53	0.200	0.623	0.000	M83	0.200	0.483	0.000	M112	0.200	0.689	0.000
M24	0.200	0.689	0.000	M54	0.400	0.867	0.021	M84	0.200	0.689	0.000	M113	0.200	0.689	0.000
M25	0.200	0.623	0.000	M55	0.200	0.867	0.021	M85	0.200	0.689	0.000	M114	0.200	0.689	0.000
M26	0.200	0.689	0.000	M56	0.200	0.623	0.000	M86	0.200	0.689	0.000	M115	0.200	0.689	0.000
M27	0.600	0.880	0.027	M57	0.200	0.526	0.000	M87	0.200	0.689	0.000	M116	0.200	0.689	0.000
M28	0.600	0.959	0.085	M58	0.200	0.623	0.000	M88	0.200	0.689	0.000				

**Figure 7** Terrorist organization centrality of the "Organization-Area of Operation" network.

### 3. ANALYSIS OF TERRORIST NETWORKS IN ASIA

### 3.1. Centrality Analysis

Centrality is an index used to measure the power of a point in a network [5], and there are three types: degree, intermediate, and near-centrality. "Degree centrality" is an index of the local centrality of a point, i.e., its own transactional power; "Intermediate centrality" is an index of the degree to which a point resides between two other points and is an index of control; "Proximity centrality" is an index of the degree to which a point is not controlled by other points [5]. Thus, if a point has a high degree centrality, it has a direct connection with many points and has a high transactional capacity; if it has a high degree of intermediate centrality, it is on the shortest path between many points and is located in an important position in the whole network; if the proximity centrality is high, point has the shortest distance from other points and may reside in the center of the network[6,7].Using the Centrality functions to calculate the centrality of the network of "organization-organizations" and "organization-areas of activity" in the Asian region, the results are as follows.

It can be seen that M11, M21 and M31 have high centrality of all three, indicating that they have direct contact with many organizations and strong ability of controlling; M8 and M111 have high intermediate centrality and low degrees and proximity to centrality, it means that they are an important nodal link for terrorist organizations to connect.

It can be seen that M11 has the highest values of the three centrality values and is the core organization in the network. M12, M28, M27, M31, M69 and M82 all have a degree centrality of 0.6. Comparing the proximity centrality shows that M28 and M82 have a high proximity and intermediate centrality, indicating that they are key organizations in the network and have more control over other organizations; whereas, M12, M27, M31 and M69 have a low intermediate centrality, indicating that they have less control over the network members.

	Degree Closeness Betweenne		
N1	0.060	0.337	0.038
N2	0.147	0.378	0.195
N3	0.086	0.369	0.027
N4	0.578	0.559	0.699
N5	0.422	0.481	0.495

**Figure 8** Regional centrality of the "Organization-Area of Activity" network.

As can be seen from the results, N4 and N5 have the highest centrality and are the most important in the network; the other three are not relatively less centric. On the whole, the regions are increasingly well connected.

### 3.2. Network Density Analysis

The density reflects the closeness of the relationship between the components. To calculate the network density, we first need to calculate the shortcut distance of each point. The network centered on M11 is analyzed, and after calculating the shortcut distance, organizations with a shortcut distance of less than 2 to the core organization (degree centrality  $\geq 10$ ) are selected to establish a relationship matrix and calculate their average distance, cohesion index and network density. As shown in figures:

Core organization	Average distance	Cohesion index	Density
M11	2.484	0.437	0.0494
M16	2.14	0.481	0.0744
M21	2.323	0.464	0.0615
M31	2.276	0.469	0.0622
M46	2.252	0.474	0.0628

**Figure 9** Table of values for three parameters.

Overall, the cohesion index and network density of the five networks are low (much less than 1), indicating that terrorist organizations in Asia are becoming more widely and loosely globalized and more mobile and flexible in their terrorist activities.

## 4. CHARACTERISTICS OF ASIAN TERRORIST ORGANIZATIONS AND COUNTER-TERRORISM STRATEGIES

### 4.1. New Features of Terrorist Organizations in Asia

First, the structure of terrorist organizations has become networked. Due to the popularization of information technology, the structure of terrorist organizations from the previous vertical organizational structure and hierarchy into a network structure with decentralized decision-making power and no affiliation to each other, with strong flexibility and organizational

capacity, which brings great difficulty to the action against terrorist forces[8].

Secondly, the regional linkage of terrorist activities is enhanced. The development of information technology has made it easier and easier for terrorists to communicate and liaise[6], and the loose network structure is conducive to the change of regions and methods of terrorist activities according to the needs, and the results of regional centrality show that regional links are becoming closer and closer and the connectivity is greatly enhanced.

Thirdly, the background of participants in terrorist activities is diversified. As terrorism is adept at using the Internet and social media to disseminate terrorist ideas, those involved in terrorist activities or potential terrorists with radicalized ideas have become common, young and diverse[8].

Fourthly, the planning capacity of terrorist organizations has been enhanced. In recent years, the means of terrorist propaganda have kept pace with the times, and there are strict channels for the circulation of funds, so that police checks can be cleverly avoided. At the same time, the terrorists' lurking cycle and planning process have become longer, making the planning of terrorist attacks more rigorous and the difficulty of combating them greatly enhanced [6].

### 4.2. Counter-terrorism Strategy

First, we have intensified our efforts to combat terrorism through the Internet. With the help of new media platforms, terrorist organizations can carry out all kinds of terrorist information network dissemination activities, and the spread of terrorist ideas is accelerated. Therefore, the State should strengthen online and offline propaganda, enhance public awareness of network security, while strengthening new media legislation and regulation to block the network transmission of terrorist information[9].

Secondly, it is necessary to strengthen the collection and sharing of intelligence on terrorism. Terrorist activities are covert in nature, so it is necessary to improve intelligence investigation methods, enhance the ability to obtain intelligence, flexibly adopt various kinds of high technology to obtain intelligence information, and at the same time pay attention to the sharing of information resources, broaden intelligence collection channels and facilitate the acquisition of information by counter-terrorism intelligence departments[10].

Thirdly, we attach great importance to international counter-terrorism cooperation. With the globalization of terrorist activities in recent years, counter-terrorism cooperation has become an irresistible trend. It is therefore necessary to strengthen counter-terrorism

cooperation with the international community on the basis of the principles of equality, fairness, mutual trust and win-win cooperation, and to work together to strengthen counter-terrorism mechanisms, so as to create a climate of friendship and cooperation and avoid the further spread of terrorist forces.

Fourthly, the Government should do a good job in combating terrorism at the border and controlling the situation in the region. Many terrorists from outside China have infiltrated our borders and are colluding with our separatist forces; therefore, it is necessary to strengthen military deterrence and preparedness in key areas, organize regular patrols, conduct regular anti-terrorist drills and maintain a high-handed posture against terrorist forces.

## 5. CONCLUSION

The issue of terrorism involves all aspects of international security, and a comprehensive understanding of terrorism and a comprehensive plan for combating it are essential. The study of the characteristics of terrorist organizations in Asia based on the theory of social network analysis can help us formulate effective strategies to win the war against terrorism.

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