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Collaboration Network of Thailand's Anti-Corruption Organizations

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Abstract

An efficient collaboration amongst anti-corruption organizations is an important factor for an effective fight against corruption. This research aimed to analyze the network of Thailand's anti-corruption organizations and compare the property of each collaboration group in the network. Data was collected by interviewing executives of 27 anti-corruption organizations in Thailand from across sectors. The collaboration level between each two organizations rated by interviewees was analyzed and categorized using Social Network Analysis and each collaborative group was categorized by the objective of each organization in that group. The result showed that the network is decentralized which weakens collaborations amongst organizations in the network and thus hinders their work effectiveness. From the data analysis, the research then offers recommendations to improve and enhance the efficiency and sustainability of collaboration in this network.

Keywords: Corruption, Collaboration, Social Network Analysis

1. Introduction

Collaboration is a necessary and an important condition for an effective fight against corruption (Pantasane, 2007). Thus, to collaborate with other organizations with a similar goal to counter corruption is an obligation or a strategy of most anti-corruption organizations in Thailand (Anti-Corruption Organization of Thailand, 2016; Office of the National Anti-Corruption Commission, 2016). However, in practice, an efficient and sustainable collaboration amongst these organizations at large is arguably rare if not absent (Anti-Corruption Social Lab Knowledge Management Team, 2016). This is primarily because attempts to collaborate are usually bilateral or between only a few entities. Moreover, most of the relationships are ad hoc and conducted on a voluntary basis. There is no system in place to facilitate an efficient and sustainable collaboration in Thailand's anti-corruption network (Sumano et al., 2015).

Consequently, the absence of such a system hinders the effectiveness of the aggregate effort to counter corruption in the country. This lack of continuous communication leads to the redundancy of similar projects, and so reduces the trust amongst these organizations and the people in them. This lack of trust then hampers the already fragile relationship amongst them and lessens their communication. This vicious cycle goes on and on in Thailand (Anti-Corruption Social Lab Knowledge Management Team, 2016).

To enhance the efficiency and sustainability of collaboration amongst Thailand's anti-corruption organizations in practice to the standard of how it is written as a principal strategy, it is crucial to clearly understand the network of Thailand's anti-corruption organizations in detail, how each organization can be categorized, how they view and are viewed by the others, and how and how often they communicate with each other. The analysis of these questions is fundamental to the design of a mechanism or a system that will facilitate the desired outcome. This paper, therefore, primarily aims to answer these questions and provide recommendations to enhance the efficiency and sustainability of collaboration in this network.

2. Social Network Analysis (SNA)

Developed in the 1970s, SNA has since been widely used in diverse disciplines, such as sociology, physics, anthropology, political science, psychology, marketing, biology and public health (Borgatti et al., 2009), since it can be used to analyze networks at many levels, from family to nation. It is often used to study relationships amongst executives in different companies; to find out how problems are solved, organizations are run, markets evolve, and to what degree individuals succeed in achieving their goals (Bazerman & Schoorman, 1983; Battiston & Catanzaro, 2004; Abbasi & Altmann, 2010; Kim, Altmann, & Hwang, 2010). In Thailand, the method is also used to study the effects of a company's board members and directors on the company's market value (Sitthipongpanich & Polsiri, 2013; Puttanapong, 2018). In general, SNA is used to study how people share information and knowledge, and to evaluate the performance of individuals, groups or entire societies (Abbasi & Altmann, 2010). Thus, this paper uses SNA to understand the relationship amongst organizations in this network.

2.1 Centrality Measures

To understand a network and its participants, it is necessary to evaluate the location of nodes within the network, as well as their centrality from a global and local perspectives. A node with a high local centrality is one that connects many neighborhoods. Meanwhile, a node with high global centrality is one that has a strategic significance in the overall structure of the network (Scott, 2013). Two of the most common global centrality measurements are the closeness centrality, a measure of the distance from all the other nodes, and the betweenness centrality, which measures how many nodes need the node of focus to connect with others (Scott, 2013; Giuliani & Pietrobelli, 2011).

2.1.1 Degree Centrality

The way to address the center node of the network is to count its connections. This is the simplest and most straightforward way to identify network centrality. The concept idea of degree is to count the number of nodes

connected to the node of interest. The degree centrality shows how well each node connects with their local encounters. However, using degree centrality may ignore the indirect connection from nodes that are not directly connected to the studied node (Nieminen, 1974; Freeman, 1978; Freeman, Roeder, & Mulholland, 1979; Scott, 2013). Normally, degree centrality is the number of ties or edges connected to each node, but in a network that each edge has a different weight, the weight can also be considered. The sum of the weight of each node, called weight degree centrality, can also be used to calculate how strong the connection each node has. The weight degree centrality should be used with degree centrality to show both quantity and quality of the connections.

2.1.2 Closeness Centrality

The degree centrality is a good indicator to present the center of the local network. Consider Figure 1(e), the center of each subnetwork will have high degree centrality. However, to indicate the center of the global network, Freeman et al. (1979) proposed another way to indicate the center, called closeness centrality. The concept of closeness centrality is to find the sum of path length from one node to all other nodes in the network. The high sum of distance length indicates that the node must travel for long distances to others. The node at the corner of the network will have a longer path length to connected to other nodes from other corners. On the other hand, a node at the center of the global network will have a short path length to all other nodes in the network. The closeness centrality indicator used in this paper is developed from the idea of Freeman, by standardizing the inverted sum of path length which will result in the number ranging from 0 to 1, where 1 means the node has the shortest path length to other nodes and vice versa (Brandes, 2001).

2.1.3 Betweenness Centrality

In some network, there are nodes that have low degree centrality and thus deemed less important but are important connectors between many subnetworks. To help to indicate such crucial nodes, Freeman (1978) and Freeman et al. (1979) introduced ‘betweenness centrality’, which indicates a

low degree node that may play an important role as 'connector' or 'gatekeeper'. Unlike other centralities, calculation of betweenness centrality is more complicated. The main concept is to count the pairs of nodes that require studied nodes to connect to each other. Like closeness centrality, betweenness is standardized to range from 0 to 1, where 1 indicates high betweenness.

$$Degree\ Centrality\ (i) = \sum_{j=1}^{n} X_{ij}$$ (Adapted from Freeman, 1978)

$$Weight\ Degree\ Centrality\ (i) = \sum_{j=1}^{n} W_{ij} \times X_{ij}$$ (Adapted from Freeman, 1978)

$$Closeness\ Centrality\ (i) = \frac{1}{\sum_j d(j,i)}$$ (Adapted from Belavas, 1950 and Freeman, 1978)

$$Betweeness\ Centrality\ (i) = \sum_{s \neq i \neq t \in I} \frac{\sigma_{st}(i)}{\sigma_{st}}$$ (Freeman, 1977)

where X_{ij} is the connected edge of node i, W_{ij} is the weight of each connected edge, d is the shortest distance between node i and j, σ_{st} is the shortest paths from node s to node t, and $\sigma_{st}(i)$ is the number of paths that passes through node i.

2.2 Collaborative Networks

In general, a collaborative network can be separated into five types: (i) centralized one-way communication network (CN), (ii) centralized two-way CN, (iii) centralized multi-CN, (iv) perfect network and (v) decentralized network. These are illustrated in Figure 1 and described in turn below.

A centralized one-way CN has the central node as a one-way information distributor. The advantage of this type of network is the unity in a managerial process that allows the central node to control the working process of the whole network. However, the main disadvantage is that it lacks the exchange of information, knowledge and resources, which is a necessary and important condition of an efficient and sustainable collaboration.

A centralized two-way CN allows the peripheral nodes to communicate back to the central node. There are two main advantages of this network. Firstly, it has unity in controlling the network similar to the first type and secondly, the central node is able to acquire information from the other peripheral nodes. However, its primary disadvantage is still the lack of information exchange

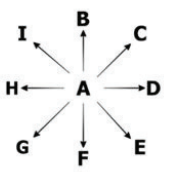
amongst peripheral nodes which then obstructs the spread of information in the network.

A centralized multi-CN is a network in which some peripheral nodes can communicate with each other without having to go through a central node. However, some other nodes that are further away from each other still need to communicate via the central node. This distinctive characteristic has three main advantages. Firstly, there is a certain degree of unity since the central node still acts as an administrator of the network; secondly, information can flow more freely; and thirdly, this type of network is relatively easier to design and facilitate compared to either the perfect network or the decentralized network (see below).

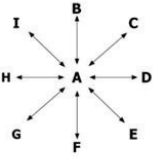
A perfect network is one where each node can communicate with the others freely without having to go through a central node. This allows information to flow freely, creating an efficient network as there is no intermediary. However, at a large scale this type of network is essentially theoretical as it is extremely difficult, if not impossible, to facilitate such a perfect connectivity for a large network in practice.

Finally, a decentralized network is basically a network of networks. There is no central node to act as an administrator and each node may be comprised of smaller networks. When it has functional and effective subnetwork connectors, this network is deemed to be most suitable to facilitate efficient collaboration.

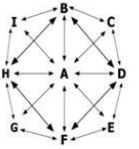
Figure 1. Different types of collaborative networks



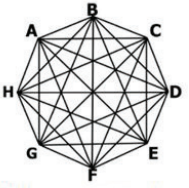
(a) Centralised one-way CN



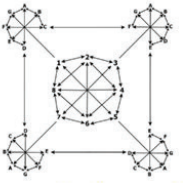
(b) Centralised two-way CN



(c) Centralised multi-CN



(d) Perfect network



(e) Decentralized network

Source: Adapted from Starkey (1997).

3. Study Objective and Methodology

The analysis begins with the hypothesis that the network of Thailand's anti-corruption organizations is a decentralized network with several groups. The three primary objectives of this paper are to specify the types of organizations and analyze the network of anti-corruption organizations in Thailand, to classify each subgroup in the network, and to suggest a more efficient collaboration for the network.

Mixed methodology, the mixing of qualitative and quantitative data, was adopted for this research. The quantitative research was analyzed by SNA, using Gephi version 0.9.2, to demonstrate the structure and pattern of the relationships of the current anti-corruption network. The researchers were able to get interviews with executives of all 27 anti-corruption related organizations in Thailand from all sectors including state, private, civil society, and international, earlier comprehensively identified by experts in this field as shown in Table 1. They were asked to evaluate the cooperative level of their organization and other organizations in Thailand on a ranked scale from 0–10.

The collaboration score was compared between each pair of organizations that rated each other, taking the smaller value to prevent an over claim bias. For example, if organization A stated that their level of cooperation with organization B was 7 points, but organization B gave it 5 points, then this research credited the relationship between the two organizations as 5 points. The collaboration scores were used in the SNA and to categorize the organization groups using Modularity (Lambiotte et al., 2009).

Table 1. Organization names and abbreviations

Organization name	Abbreviation	Sector	Brief anti-corruption related missions
Anti-Corruption Foundation	ACF	Civil Society	- initiate and support corruption prevention projects - cultivate virtue in the society
Anti-Corruption Organization of Thailand	ACT	Civil Society	- initiate and support corruption prevention projects - cultivate virtue in the society - disclose corruption cases
Boonmee Lab Co.,Ltd.	Boonmee Lab	Private	- provide technological support
Comptroller General's Department	CGD	State	- initiate and support corruption prevention projects - organize public procurement and create transparency
Digital Government Development Agency (Public Organization)	EGA	State	- provide technological support
Fight Against Corruption Together	Fight Against Corruption Together	Civil Society	- initiate and support corruption prevention projects
Foundation for a Clean and Transparent Thailand	FACT	Civil Society	- initiate and support corruption prevention projects - cultivate virtue in the society

HAND Social Enterprise	HAND	Private	- initiate and support corruption prevention projects - support anti-corruption ecosystem
Isranews Agency	Isara	Private	- investigate and disclose corruption cases
Khon Thai Foundation	KTF	Civil Society	- initiate and support corruption prevention projects
National Anti-Corruption Commission (Thailand)	NACC	State	- prevent and suppress corruption at higher-level - cultivate virtue in the society
National Anti-Corruption Committee	ACC	State	- initiate and support corruption prevention projects
Office of Public Sector Anti-Corruption Commission	PACC	State	- prevent and suppress corruption at lower-level - cultivate virtue in the society
Office of the Auditor General of Thailand	OAG	State	- review, scrutinise, and investigate government spending
Office of The Public Sector Development Commission	OPDC	State	- initiate and support corruption prevention projects in public sector
Opendream Co., Ltd.	Opendream	Private	- provide technological support
People Network for Election in Thailand	PNET	Civil Society	- initiate and support corruption prevention projects especially in election
Social Integrity Architecture and Mechanism design Lab	SIAM Lab	State	- research on anti-corruption and good governance area
Social Technology Institute	STI	Civil Society	- provide technological support
Sujarit-Thai	Thai No Corrupt	Private	- cultivate virtue in the society
Thailand Development Research Institute	TDRI	Civil Society	- research on anti-corruption and good governance area

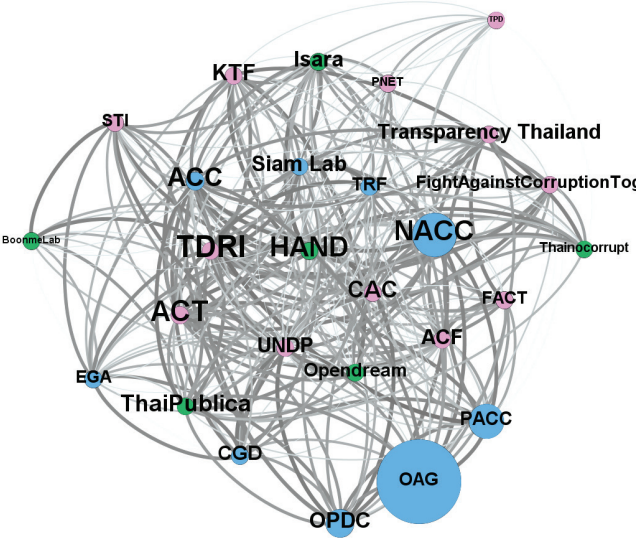
Thailand Political Database	TPD	Civil Society	- create political database to support anti-political corruption movement
Thailand Private Sector Collective Action against Corruption	CAC	Private	- create good governance criteria for private companies - certify companies that have good governance
Thailand Research Fund	TRF	State	- support anti-corruption and good governance enhancement research
ThaiPublica	ThaiPublica	Private	- investigate and disclose corruption cases
Transparency Thailand	Transparency Thailand	Civil Society	- initiate and support corruption prevention projects - cultivate virtue in the society
United Nations Development Programme	UNDP	International	- initiate and support corruption prevention projects

4. Results

4.1 SNA of Thailand's Anti-corruption Organizations

After collecting the data from 27 organizations it was graphically plotted using SNA, where the result showed that most organizations were connected as a giant component (see Figure 2).

Figure 2. Collaboration network of Thai anti-corruption organizations.



Notes: Circles are the anti-corruption organizations; lines are the collaboration between each organization. The size of each circle indicates the number of employees in that organization, the thickness of each line represents the strength of the collaboration and the size of the text represents the weighted degree centrality. The subordination of the organization is represented by the color of the circle, where pink is a civil society organization, light blue is a government organization and green is a private organization.

Source: Authors' calculations.

Table 2 shows the degree centrality value of each anti-corruption organization, which ranged between 16 (least cooperative) to 26 (most cooperative) connections. Note that this model included all levels (degrees) of collaboration in the analysis, ranging from level 1–10; from making a phone call to being a partner in a project.

The normalized (0–1) closeness centrality (closeness) values ranged between 0.72–1, which implies that the network had a high degree of unification, where most organizations can contact others directly. There were eight organizations that could fully connect directly with every other organization. The organization with least centrality had a normalized closeness centrality value of 0.72, indicating that they still could connect effectively with other

organizations. The results also showed that the network had developed to be close to a perfect network (a network where every member is able to contact others directly).

The betweenness centrality is an indicator of the degree of being a connector, where an organization with a higher betweenness value tends to receive more information and be a better connector than an organization with a lower value. The normalized (0–1) betweenness centrality values in this network ranged from 0.01–0.09, which reflects that none of the members in the network act as a connector between two organizations. No organization had an outstanding betweenness centrality value because most of the organizations were well connected.

The average degree centrality and weighted degree values were 22.59 (median of 23) and 127.8 (median of 129.5), respectively, which supports that almost every organization had a high connection level and the whole network was developing into a perfect network.

Table 2. Centrality values of each of the 27 Thai anti-corruption organizations

Organization	Type<?>	Size	Degree	Weighted Degree	Closeness	Betweenness
HAND	P	7	26	174.5	1	0.01
CAC	C	5	26	150.5	1	0.01
Opendream	P	19	26	118.5	1	0.01
SIAM Lab	G	3	26	137.5	1	0.01
TDRI	C	10	26	194.5	1	0.01
TRF	G	20	26	116.5	1	0.01
UNDP	C	10	26	131	1	0.01
ACC	G	54	26	166	1	0.01
ACF	C	5	25	132	0.96	0.01
NACC	G	1200	25	180	0.96	0.01
ACT	C	30	24	185	0.93	0.01

FACT	C	5	23	104.5	0.9	0
KTF	C	5	23	142	0.9	0.01
PNET	C	3	23	73.5	0.9	0.01
ThaiPublica	P	5	23	146	0.9	0.01
Transparency Thailand	C	3	23	129.5	0.84	0
CGD	G	15	22	127	0.87	0
Isara	P	8	22	141	0.87	0
Fight Against Corruption Together	C	1	21	106.5	0.84	0
PACC	G	800	21	122.5	0.84	0
EGA	G	20	20	108.5	0.81	0
OAG	G	3000	20	117	0.81	0
OPDC	G	500	19	136	0.79	0
STI	C	3	19	106	0.79	0
TPD	C	3	17	48	0.74	0
Boonmee Lab	P	9	16	69	0.72	0
Thai No Corrupt	P	3	16	87	0.72	0

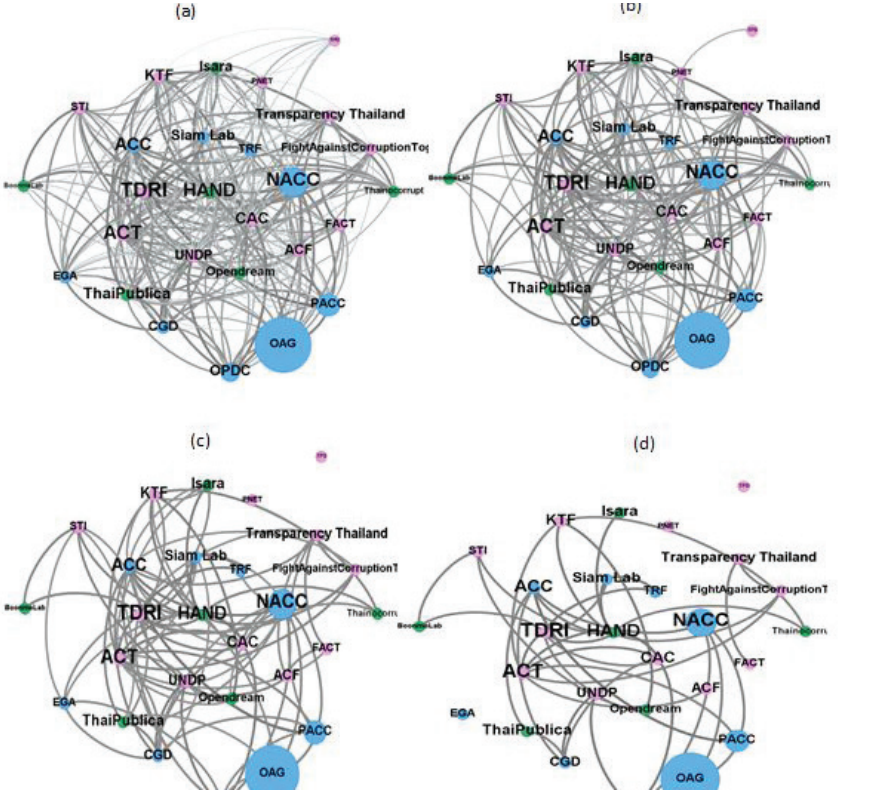
Source: Authors' calculations.

4.2 Filtering the Relationship to Analyze the Main Structure of a Network

The above analysis considered all collaborations, using every form of collaborative information from 1–10, and so revealed the whole picture of the system. However, this does not reflect a clear picture of the main structure of the network because it took weak relationships into account. Thus, to reduce bias, the analysis was repeated after filtering out the weak relationships. The results displayed in Figure 3 show a clearer picture of the main structure of

the network.

Figure 3. SNA of Thai anti-corruption organizations after filtered connections.



Notes: Shown are the (a) whole network and (b-d) the relationship networks with a relationship stronger than a (b) 6 rating, (c) 8 rating, and (d) 9 rating. Circles are anti-corruption organizations, and lines are the collaborations between two organizations. Circle size shows the number of employees in the organization, line thickness shows the strength of the collaboration, and the text size shows the weighted degree centrality.

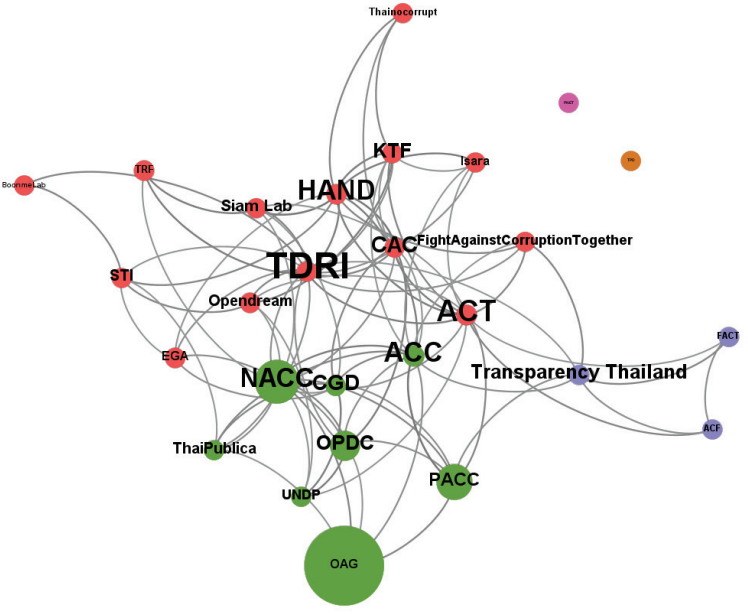
Source: Authors' calculations.

4.3 Group Clustering

After filtering out the weak network relationships, modularity (Lambiotte et al., 2009) was applied to cluster the network. The result revealed three connected groups, where each group had its own centrality. Group A, the civil society and private sector, had the TDRI, Hand and CAC as the centers. Group B, the public (government) sector, had the NACC as its center, while Group C,

also the civil society sector, had three organizations (Transparency Thailand, FACT and ACF) with no center. There were also two isolated organizations (PNET and TPD).

Figure 4. Network groups under the cooperative network of the anti-corruption organizations in Thailand



Notes: Three groups are evident: Group A: civil society and private sector (crimson circles); Group B: public sector (green circles); and Group C: civil society (blue circles).

Source: Authors' calculations.

After comparing the four kinds of a network with the model from Starkey (1997), we found that the anti-corruption network in Thailand had a characteristic of a decentralized network as hypothesized. As mentioned, for such a network to facilitate efficient collaboration, it requires functional and effective connectors amongst subnetworks.

4.4 Group Clustering Validation

To validate the cluster analysis in this research we compared the group classifications by mission in Yomnak et al. (2018) with the results shown in

Table 2.

Table 3. Group of anti-corruption organization classified by their collaboration and their mission[1]

Group classified by mission	**Group classified by collaboration**		
	Group A civil society and private	**Group B** government/ state	**Group C** civil society sector
Group 1: Technology and Innovation	10	0	0
Group 2: Suppression	2	7	3
Group 3: Media	2	1	0

As shown in Table 3, the first group classified by mission in Yomnak et al. (2018) was also classified in the same group (Group A) using collaboration, but Group A also had four more organizations, two from group 2 and two from group 3, which had a strong collaboration and were classified as the same group even though they have different mission aspects. Group 2 is a group of organizations that had a mission related to suppression and policy. Classification by collaboration showed that this group also had work collaborations with other organizations in the same group. However, this same group was divided into two sub-groups, a large one with seven organizations and a smaller one with three organizations. These two sub-groups had a strong degree of separation, enough to be statistically significant. Group 3 had a mission related to media and mass communication. In this group, Issara and Fight Against Corruption had a strong connection with group A, while ThaiPublica was connected to group B. Importantly, the result showed that there were collaborations related to their mission and that some organizations act as the connector between clusters, such as Anti-Corruption Organization (Thailand) or ACT that had a mission classified as group 2 (public sector) but also had collaborations with Group A (mainly an organization with a civil society mission). Connecting nodes like this is crucial to the collaboration in this network and thus should be supported and promoted.

[1] TRF is missing from Yomnak et al. (2018)

5. Summary and Discussion

Networking among public, private and civil society is essential for anti-corruption organizations. This issue has been mentioned in the vision, obligation, and mission statements of many organizations. Moreover, the media and citizens are interested in this issue. According to the theory on collaboration and work under a form of a network, if a network is managed with an effective system and strategy, it can enhance the anti-corruption related works. An example in Indonesia where a strong and effective collaboration amongst more than a hundred anti-corruption groups and agencies from all sectors could lift its corruption perception index (CPI) evaluated by Transparency International (TI) significantly since 2004 illustrates the importance of the argument drawn from this research.

To understand the landscape of Thailand's anti-corruption network, this paper collected information from executives of all 27 anti-corruption organizations from the public, private and civil society and used Social Network Analysis (SNA) to statistically analyze the data. The result showed that Thailand's anti-corruption network is a decentralized network, where there is no central node to act as an administrator and each node may connect to other smaller networks, which arguably weakens the collaboration in the network. It follows that intermediaries are needed to bridge organizations in these smaller networks with those who share similar goals and strategies or lack resources that some others may have. Through this research, we learn that there are currently some organizations playing this important role of connecting and managing the network, such as ACT. However, they are relatively small in both size and influence. Therefore, it is crucial that such organizations are well supported and more should be introduced. This will allow all organizations to be able to help each other while maintaining the direction towards their goals without any interruption. On the other hand, these connectors can and should use findings from this research in terms of degree, closeness and betweenness centrality to strategically connect organizations and subnetworks to efficiently facilitate efficient collaboration. Through these suggestions, Thailand can

strengthen its anti-corruption network and become more effective in delivering impactful results in reducing corruption in the country.

Furthermore, this research illustrates the potential of SNA as a tool to analyze and evaluate the collaboration of anti-corruption organizations. The paper aimed to investigate and analyze the linkages and primary characteristics of anti-corruption organizations in Thailand. Future research should be able to use these findings to compare with similar networks in other countries that are more successful in their anti-corruption efforts. Such work may offer alternative solutions to more efficient and effective anti-corruption policies in Thailand.

6. Study Limitations

The limitations of this study are the size of information, the process of making a questionnaire, statistical calculations, and data validation that may occur from bias during the evaluation process. Understandably challenges arose from collecting information between organizations that require personnel in each organization to evaluate the relationship between themselves and other organizations. The data was examined by comparing the value that the reciprocal organizations gave and evaluated the requirements to improve this research in the next stage.

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