Policy Networks in Disaster Management: A Case Study of the Hebei Spirit Oil Spill*

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Abstract: Due to rapid social change, the government does not have enough resources to manage urgent situations such as natural disasters. Recently, research on cooperative disaster management systems has increased, making it possible to respond to disasters more effectively. A "policy network" model is utilized to analyze the relationships among actors, with a particular focus on actors' behavior and network structure. Key findings are as follows: First, the participants in a disaster response network include the government sector as mandated by law, and the nongovernmental sector, which represents various interest groups. Second, the interactions especially among government departments or among NGOs, are dynamic as participations frequently engage and work with each other. Interaction between other sectors, however, is relatively low. Third, the policy network tends to form conflict-ridden relationships with low credibility. The low level of credibility among other sectors creates obstacles to cooperative partnership and can increase the costs of disaster management in the long term.

Keywords: Policy Network, Disaster Management, Hebei Spirit Oil Spill

INTRODUCTION

Disasters causing massive damage are not unusual in South Korea. Recent disasters include the Hebei Spirit oil spill and the Icheon refrigeration warehouse blaze. Earlier large-scale disasters range from calamities of human origin like the Seongsu Bridge

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collapse (1994), the Sampung Department Store collapse (1995), and the Daegu subway arson incident (2003) to natural disasters like typhoons Rusa (2002) and Maemi (2003). Under these circumstances, people's safety needs are rising more dramatically than before (Sung 2006). Whenever a disaster occurred, however, previous governments managed it with temporary and makeshift measures rather than responding in a systematic way (Lee & Yang, 2004). In addition, the changing administrative environment creates a complicated reality where a single organization cannot manage a disaster independently, and government resources are often insufficient to deal with social problems (Lee, 2002). In the United States, more than 85 to 90 percent of the critical national infrastructure is owned by the private sector (Goldsmith & Eggers, 2004). And with the development of information and telecommunications technology, the amount of information and professional knowledge owned and produced by the private sector is far greater than that of the public sector, and this phenomenon is likely to intensify gradually (Go, 2007). Owing to the limits of the government sector, the participation of the nongovernment sector in disaster management is expected to enhance the administrative competence.

Considering this situation, recent studies have suggested that more effective disaster management is possible if the government, citizenry, and private sector work together to address issues that cannot be tackled by the government alone in a disaster, and furthermore, if a "cooperative management system" is established. Under a discourse on governance, however, the extensive nongovernmental sector is participating in all policy processes, including policy agenda setting, policy-making, and policy implementation and evaluation. Still, only a few empirical studies on "policy networks" have been presented that examine the dynamic interactions of these participants in disaster management. Besides, as domestic oil demand is increasing rapidly every year, fueled by the nation's economic growth, the frequency of marine pollution incidents is also on the rise (Kang, 1996), but the nation still lacks an effective response system.

The purpose of this study is to analyze the dynamic aspects of policy making and implementation in disaster response and recovery by using the policy network framework. This study attempts to investigate the Hebei Spirit oil spill incident,[1] which occurred in the sea off Taean-gun, South Korea on December 7, 2007. It examines how the policy network performs in policy making and implementation during a marine disaster while cleanup activities are underway. Specifically, it focuses on three

1. At 7 a.m. on December 7, 2007, 21,547 kiloliters of oil spilled into the Yellow Sea off Mallipo, Taean-gun, Chungcheongnam-do, South Korea, after the oil tanker Hebei Spirit collided with a barge carrying a crane. The incident, which is called the Taean oil spill by the news media, is referred to here as the Hebei Spirit oil spill incident.

questions: First, who are the participants in the policy network for disaster management? Second, what are the frequency and direction (unilateral or bilateral) of interactions in the network? Third, are the relations in the network cooperative or conflictive—and is the network closed or open?

The scope of this study is about five months, from the time of the incident to May 2008. Interviews with private-sector participants from environmental NGOs and experts and officials from central and local governments were conducted to analyze the interactions between organizations during the cleanup. By going beyond a discussion about a static partnership, this study examines the interactions between active participants, and is expected to become progressive research on more efficient disaster management.

LITERATURE REVIEW

Definition of Policy Network

A policy is generally defined as governmental behaviors to handle various issues focused on public interests (Jung, 1998). With changes in the administrative environment, however, diverse actors have influence on government policies which were once handled solely by government. As a result, policies are determined and carried out through complicated and diverse interactions among those actors. In order to comprehend these interactions, new policy decision-making and executive mechanisms are needed. Likewise, the governance mechanism quoted in Rhodes' (1996, 1997) "New Governance Thesis" is formed and executed through policy networks consisting of more complicated and diverse organizations (Hudson et al., 2007).

The term "policy network" refers to the relationships among elements of civil society and a government to make policies (Montpetit, 2002). In other words, the notion of policy network is used to understand and analyze actors' behaviors through the policy-making process and estimate the interactions among these actors. Researchers have suggested many different types of policy networks, but the most universal is the policy network model presented by Marsh and Rhodes (1992). The model describes five categories: policy communities, professional networks, intergovernmental networks, producer networks, and issue networks (Pemberton, 2000). These are distinguished "ranging along a continuum from highly integrated policy communities to loosely integrated issue networks" and "according to their membership and the distribution of resources among members" (Marsh & Rhodes, 1992).

Many scholars have conducted empirical studies on the Rhodes Model of policy

networks. For instance, Lewis et al. (2008) conducted exploratory research on the network structures and relationships of primary care partnerships (PCPs) in Australia. Toke (2000) also carried out exploratory studies on the types of policy networks working on energy efficiency. His study found that the energy efficiency network showed characteristics of a policy community, which was the most closed and integrated of Marsh and Rhodes' (1992) policy network categories. In addition, Mikkelsen (2006) has conducted a study on policy networks for the National Childbirth Trust, a nonprofit organization in the United Kingdom. He employed Sabatier's (1998) General Model of Policy Change as a framework of analysis and argued the validity of this model even in the private sector. In the meantime, there has also been dynamic research demonstrating that the types of networks have transformed in the long term. In the same context, Pemberton (2000) explained changes in policy networks through a study of the economic policies of the United Kingdom in the 1960s and 1970s.

In addition to such exploratory research, studies were carried out on how each type of policy network influences policy outcomes. Hudson et al. (2007) conducted comparative research on two cities, Harchester and Melchester. The process of adopting sustainable development policies was predominantly led by the public in Harchester and by local authorities in Melchester. Hudson et al. concluded that the government-led process in Melchester was more effective in fostering participation, producing substantial influences from the policies, and building up a long-term partnership. Furthermore, the research enabled them to present an opposite perspective to Rhodes's idea that policies can be organized autonomously.

Comparative studies by Montpetit (2002) of how environmental regulations are developed for agriculture indicate that there is a difference in network formation between the United States and Canada that has influenced the outcomes. The study shows that the federal system in the United States causes the adoption of strict regulations in agriculture, while a similar federal system hinders formulation of strict regulations in Canada. The studies of Toke and Marsh (2003) also show that the policy network influences the policy outcomes. They carried out research on policy change regarding genetically modified (GM) crops, based on a dialectical model, and concluded that the policy network as an independent variable has influence on outcomes of policies. However, this research was critically reviewed by Kisby (2007), who argued that the policy network is an intermediate variable rather than an independent variable. Also, Daguerre (2000) conducted comparative studies of child-care policies in England and France from 1980 to 1989, which helped to explain the complex relationships between stakeholders in the policy-making process including government, interested parties, and individuals. However, she noted that it was difficult to analyze causal relationships because in some cases outcomes of the policy network are influ-

enced by the network itself.

As shown in Table 1, most previous studies on the policy network model presume the involvement of diverse participants in policymaking rather than exclusive action by a government alone due to the change of policy environment.

Table 1. Policy Network Literature Review

Author	Research Topic	Research Method	Findings and Implications
Mikkelsen (2006)	Voluntary sector	Case study	Policy networks are helpful in better understanding the organization, relationships, and status of a network.
Toke (2000)	Energy efficiency in domestic building	Case study	A policy network was formed for energy efficiency. The historical institutionalist approach is beneficial for a policy network.
Lewis et al. (2008)	Primary health care in Australia	Comparative research	Research on network structures and relationships in primary care partnerships (PCPs)
Pemberton (2000)	UK economic policy in the 1960s and 1970s	Case study	Social learning can affect policy change. Different orders of policy change are related to different network configurations. A "meta-network" can sometimes be formed.
Hudson et al. (2007)	Local environmental policy-making	Comparative research	Having the state exercise more power in the network enables a more sustainable network after policy-making.
Montpetit (2002)	Environmental regulations in Canada and the United States	Comparative research	Federation structure distinguishes between the two countries, which have implemented stringent environmental regulations.
Toke and Marsh (2003)	Genetically modified crops	Case study	Through a dialectical model, the research examines how to change GM crops policy. The formation of a policy network can have an effect on outcomes.
Kisby (2007)	Genetically modified crops	Review of Toke and Marsh's study	An analysis of the policy network as an intermediate variable and policy outcome as a dependent variable, in contrast to Toke and Marsh's (2003) research, which viewed the policy network as an independent variable.
Daguerre (2000)	Child care policy from 1980 to 1989 in England and France	Comparative research	The policy network model is a powerful explanation of complex relationships among government, stakeholders, and individuals. Outcomes can be influenced by a policy network. However, there may be other elements functioning as independent variables.

A Conceptual Model of Policy Networks

Each policy network is comprised of diverse components; the characteristics and structures of networks are determined by these elements. Marsh and Rhodes' (1992) model included participants, integration, distribution of resources, and power. As shown in Table 2, they have analyzed the policy network with the addition or the omission of these components. The conceptual model of the current study includes the participants (actors), their interactions and the nature of relationship (network structure), which were commonly mentioned in the previous studies. Table 3 shows the components of the policy network models considered in previous studies.

Table 2. Components of the Policy Network Model

Author	Components of Policy Network Model
Marsh and Rhodes (1992)	Participants, integration, distribution of resources, power
Marsh and Smith (2000)	Participants, structure, interaction
Toke (2000)	Membership, integration, institutionalization
Pemberton (2000)	Membership, level of integration, resources, power
Kriesi et al. (2006)	Distribution of power, dominant type of interaction
Mikkelsen (2006)	Participants, structure, relationships

Table 3. Components of the Conceptual Model

Factors and Variables		Measurement Index
Participants	Actors	Individual groups, nongovernmental organizations, government, etc.
	Incentive	Motivation
	Behavior	Attitude (active vs. passive)
Interaction	Frequency	How do they interact with each other?
	Direction	One-sided or mutual
Structural Characteristics	Conflictive vs. cooperative	Share or do not share the same goal
	Closed vs. open	Easy to participate in the community

Participants in policy networks are groups or individuals who exercise their influence through the policy-making process in order to accomplish their goals. Analysis of participants is focused on how many organizations participate in policy-making and the nature of the participants (Park & Ko, 2007). Participants Factor will be reviewed from the viewpoint of the group unit, incentive structure, and behavior of participants.

Each variable can be measured by the group unit and the number of participants. Also, the incentive structure and behavior can be analyzed by the nature of the participants, such as attitudes and motivation for participation. In addition, interactions of participants are a substantial process in which policy resources are mobilized and exchanged in order to realize their policy goals (Yang, 2003; Kim et al, 2008). These interactions are based on trust or the agreed rules of the game for the purpose of exchanging policy resources among participants and accomplishing their common purpose. Therefore, individuals cannot determine interactions of the participants by themselves. In relevant empirical studies, whether the relationship is formed and whether participants will attend committees or meetings were used to evaluate interactions, but researchers also need to comprehensively work on the factors affecting the formation of relationships as well as the structure of relationships. This study investigated the frequency of interactions among participants and the direction (unilateral or bilateral) of relationships in the policy network.

Finally, the structure of policy networks refers to the types of relationships between individuals and participants, which have influence on outcomes of behavior, concept, attitude, and so on (Knoke & Kuklinski, 1982; Waarden, 1992). Scholars have suggested various measurement indexes, and this study centered on whether relationships between participants are cooperative or conflicting and whether it is easy to participate and withdraw. To investigate the relationship among participants, the study utilized the question, "Do participants share the same goal?" Whether it is easy to participate in and withdraw from a network also represents the exclusiveness of the network structure. Exclusiveness is related to participants' access to the policy-making process and new participants' access to the network structure. In short, with mandatory joining, hierarchy, and centripetal policy unit, the network would be considered a strict structure due to the high level of systematization (Yishai, 1992; Kim, 2005).

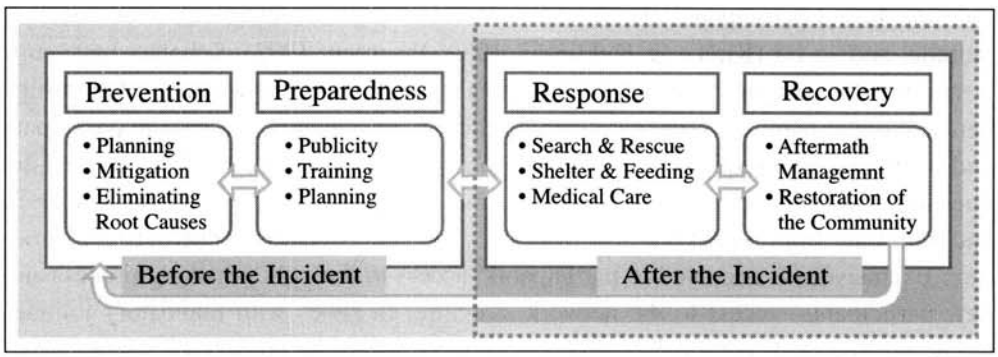
POLICY NETWORK FOR DISASTER MANAGEMENT AND RECOVERY

Disaster, like calamity, involves risks and uncertainties. Generally speaking, a disaster is of human origin and a calamity is of natural origin (Yang, 2004; Sung, 2006). But both entail risk and uncertainty. Thus, for instance, the Hebei Spirit oil spill would be regarded as a disaster. According to the Article 3, Clause 1 of the Disaster Management and Safety Act, a disaster "is highly likely to damage or is damaging the lives, bodies, properties of the people and the country," and disasters are defined as "calamities triggered by a wide range of natural phenomena such as typhoons, floods, heavy rains,

strong winds, winds and waves, tidal waves, heavy snowfalls, droughts, earthquakes, yellow dust, red tide and others" or "damages by fires, collapses, traffic accident, chemical accident, environmental pollution accident and others prescribed by the Presidential Decree" or "damages resulting from the paralysis of the nation's fundamental infrastructures including energy, telecommunications, transport, medical service, water service, and the spread of epidemics."

Disaster management refers to the steps taken to minimize damage from prevent, and respond to disaster. It covers the whole process of developing policies on mitigation, planning, response, and recovery, and implementing them (Yim, 1996). Disaster management includes the response to a currently occurring situation, and can be viewed from either a broad or narrow perspective. The broad view includes all four steps of the process—prevention, preparedness, response, and recovery—while the narrow perspective only refers to the steps of response and recovery (see Figure 1).

Figure 1. The Process of Disaster Management



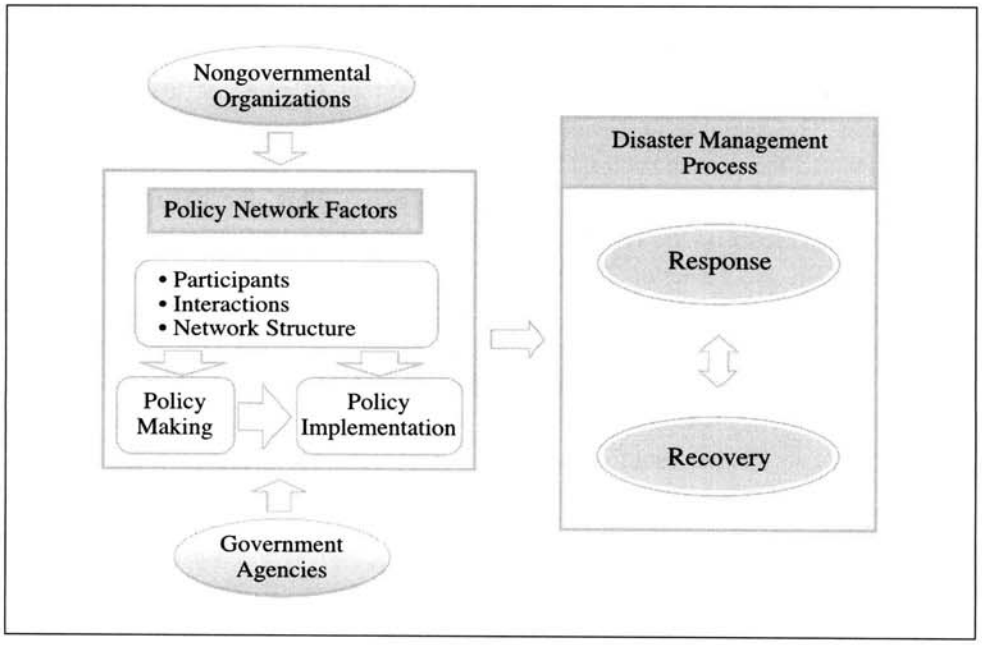
Source: Petak 1985, Yoo 2007, Sung 2006.

Prevention involves eliminating the root causes of the disaster, or mitigating its effects, before it happens. Preparedness involves developing plans, raising public awareness, and conducting exercises to train for different disaster situations. During a response, a wide range of services would be offered to people for immediate relief, such as food, shelter, search and rescue, and emergency medical care. Recovery involves helping the damaged area return to normal through aftermath management (Petak, 1985; Yoo, 2007; Sung, 2006). Cigler (1988) defines the response step as "the one where the search of the hit area and rescue operations would be involved as immediate responses against the disaster, and collaboration network among the relevant organizations could be established to minimize the possible secondary risk and to provide relief supplies." According to Petak (1985), in the response step, "the possible

secondary risk is reduced and trivial problems are eliminated for more efficient relief work" (Ryu, 2007). Additional functions of the response step include warning, emergency medical care, search and rescue, maintaining national security, and emergency recovery operations (Lee, 1998). The recovery step is usually conducted after the disaster response.

This study aims at understanding the policy network in depth and its functioning during the response and recovery phases of a disaster, focusing on the participants, how they interact, and the structure of the network. Literature on disasters tends to examine disaster management without considering each process (Lee & Yang, 2004; Lee et al., 2008; Park, Roh, & An, 2004; Choi et al., 2006). However, the response and recovery steps have different goals; each step of disaster management requires the appropriate tools or even a different policy network, with a dynamic approach to choosing the best tools and networks.

Figure 2. Conceptual Framework



The response to the Hebei Spirit oil spill included emergency cleanup (Marine Pollution Prevention Act Article 51, Clause 1) and on-the-spot response management. The recovery step was divided into two parts: immediate emergency measures and long-term environmental recovery and compensation for damage. The normalization

of the area damaged by the oil spill was expected to take an estimated ten to twenty years.[2] Compensation was still ongoing at the time this study concluded on May 20, 2008. This study consisted of a literature survey and interviews with key actors.[3] The interviewees were chosen from various sectors including the central government, local governments, NGOs, and for-profit organizations to ensure broad representation. The framework of the study is shown in Figure 2.

ANALYSIS OF POLICY NETWORKS IN DISASTER MANAGEMENT

The Response Step: Cleanup

Participants

According to an official accident report by the Taean-gun (2008), at 7:00 a.m. local time on December 7, 2007, 10 km (6.2 miles) off the coast of northwest Mallipo in Chungnam province, Samsung's barge collided with the oil tanker Hebei Spirit at anchor off Daesan Port. When the line between the barge and the tug towing it broke down due to gale force winds, about 12,547 metric tons of crude oil leaked from the Hebei Spirit. The response to the incident was carried out by two groups: the government sector and the private sector. Government participants responded as directed by law, while private ones voluntarily joined the network. First, the government as an official participant set up the National Disaster Response Center under the Ministry of Maritime Affairs and Fisheries (MOMAF), in accordance with Article 14 of the Disaster Management and Safety Act, and held a meeting on emergency preparedness and response at 8:30 a.m. on the same day. The Korea Coast Guard (KCG) established the Cleanup Response Center and activated the Task Force Team, in accordance with Article 51 of the Marine Pollution Protection Act. At 11:00 a.m., the National Disaster Safety Response Center, established in large-scale disasters by presidential decree, was set up under the Ministry of Government Administration and Home Affairs (MOGAHA), and the Local Disaster Response Center was set up under the Taean-gun

2. The Ministry of Environment anticipated that it would take ten years to show clear signs of ecological recovery from the Taean oil spill accident, and over twenty years to achieve a full recovery (MBC News, March 13, 2008).
3. Nine people were selected for interviews through a structured questionnaire, and necessary information was collected and analyzed. While the number of interviewees was not enough to enable quantitative analysis, the result was quite similar to results encountered during the literature survey and in previous studies.

Office (Lee, 2008). In accordance with the Marine Pollution Cleanup Guidelines, the Cleanup Technical Support Group—composed of experts from nine organizations including the KCG,[4] Korea Ocean Research and Development (KORDI), and others —joined the response as an advisor (Lee et al., 2008). Four hours after the oil spill, a number of response centers were set up under the MOMAF, the KCG, the Ministry of Public Administration and Security (MOPAS), and the Taean-gun Office in accordance with the Disaster Management and Safety Act and the Marine Pollution Protection Act.

Emergency cleanup operations at sea were coordinated by the KCG, while local authorities controlled cleanup operations on land in accordance with the law. The accident affected Chungnam, Jeonnam, and Jeonbuk provinces, of which Taean-gun in Chungnam was the most devastated area (interview with Mr. S, officer of the KCG Cleanup Response Center, May 9, 2008). The MOMAF and the MOGAHA, which were in full charge of the incident, cooperated with other government authorities such as the Ministry of National Defense (MOD), the Ministry of Commerce, Industry, and Energy (MOCIE), the Ministry of Environment (MOE), the National Police Agency, and the Forest Service. The MOCIE was also responsible for logistics by supplying helicopters and personnel. The Ministry of Finance and Economy (MOFE) and the Ministry of Planning and Budget (MOPB)—in charge of financial support for the residents affected by the oil spill—held a meeting for discussion and response in order to offer financial aid and tax-cuts as well (e-daily, Dec. 20, 2007). As mentioned above, not only fully responsible ministries such as the MOMAF and the MOGAHA but also a number of related authorities joined the cleanup efforts.

As for the private sector, cleanup operations were carried out by residents and volunteers.[5] On Dec. 8, about 600 soldiers, local residents, and volunteers joined cleanup efforts (SBS News, Dec. 8, 2007), and on Dec. 9, many others joined the response, for a total of approximately 10,000 (The Korea Economic Daily, Dec. 9, 2007). Despite continuing cleanup efforts, by Dec. 10 the spilled oil had spread 167 km (103.8 miles) along the shoreline from Garorim Bay in Seosan to Nepasudo in Anmyeon town,

4. Article 48 of the Marine Pollution Protection Act states that in the event of maritime waste, including oil, the polluter is responsible for emergency measures of cleanup activities. In the case of the Hebei Spirit oil spill, however, the amount of spilled oil was twice as much as the Sea Prince accident in 1995, which required urgent cleanup. Therefore, in accordance with Article 50 of the same act, stating the necessity of administrative organization's cleanup operations and budget payment, the KCG, not the ship owners, carried out the operations (interview with Mr. S, officer of the KCG Cleanup Response Center, May 9, 2008).
5. However, the oil spill polluters of the Hebei Spirit incident, Samsung Heavy Industries and Hyundai Oilbank, did not take effective measures during the disaster response.

Chungnam (National Disaster Safety Response Center, 2008). A total of 18,045 people participated in cleanup activities on that day (The Hankook Ilbo, Dec. 10, 2007).

Interactions Among Participants

Interactions among participants during the response represent two different aspects. In a broad sense, it was the government sector that showed frequent interaction and cooperation, among local authorities, among central government organizations, and between the former and latter. Centers established immediately after the accident are good examples of these beneficial working relationships. Each organization shared personnel and equipment and called for support from each other. In particular, the KCG Cleanup Response Center played a leading role in corresponding with local authorities and the ministries, including the Office of Customs Administration, the MOPAS, and the Ministry of Foreign Affairs and Trade (MOFAT), and provided information through a daily report on the status of cleanup operations (interview with Mr. J, officer of the KCG Cleanup Response Center, May 9, 2008). Another participant had this to say:

> After I asked for more equipment and personnel from the central government, 44 people and new equipment were provided. In addition, Chungnam Province deployed the Comprehensive Response and Support Center to the Taean-gun Office in response to the oil spill. The central government was frequently in contact with us regarding support from the National Emergency Management Agency (NEMA) and the MOMAF, which are in control of disaster management. (Interview with Mr. L, officer of Taean-gun Office, May 9, 2008)

Local authorities in affected areas corresponded closely with the central government as well. The Comprehensive Response and Support Center within Chungnam Province was also said to be in contact with other local authorities (Jeonnam and Jeonbuk), the KCG, the central government organizations, and the provincial assemblies. According to the survey, which used a five-point scale to measure the frequency of contact with other participants (1=barely or never to 5=very frequently), members of the central government and local authorities rated the contact 5, while it received a relatively low score of 3 with NGOs (interview with Mr. J, officer of the KCG Cleanup Response Center, May 9, 2008). As for interviews with NGO, there was a similar response. To the same question, members of NGOs gave a rating of 5 for contact with residents and the media, while they gave a rating of 1 for contact with central government and local authorities (interview with Mr. C, an NGO member, May 16, 2008). In other words, the private sector's activities occurred sporadically and the frequency of contact between private and government sectors was low.

The Structure of the Network

During the urgent phase of the cleanup, the KCG coordinated cleanup response at sea with 306 helicopters, 4,475 pollution control ships, and other equipment and resources in cooperation with relevant organizations, and local authorities took control of the response on land (Taean-gun Office, 2008). Still it was beyond authorities' capacity to properly deploy and lead volunteers, who averaged 15,000 every day.

> Government officials are busy in guiding volunteers, and issuing train ticket confirmation and volunteer work certificates. More time could guarantee better guidance, ... people rush here to help on their schedule, not consistent with our schedule, so it is more difficult to control them. ... We rarely have a holiday due to influx of volunteers. (Interview with Mr. L, officer of Taean-gun Office, May 9, 2008)

Aside from the government sector's cleanup operations, civil groups set up their own organizations and joined the efforts (interview with Mr. C, NGO member, May 16, 2008). Local authorities did not, however, properly recognize the importance of the private sector's role. As one official said:

> We do not know nongovernmental groups and cannot acknowledge them. Volunteers are officially recognized by our county, so environmental groups just can be a secondary actor. (Interview with Mr. L, officer of Taean-gun Office, May 9, 2008)

Concerning the limitations on manpower, the NGO member identified as Mr. C in this study said that cooperative networking between the government and the private sector would resolve this problem.

Interim Conclusion

The emergency decision-making process conducted by the Cleanup Response Center under the National Contingency Planning excluded the engagement of private organizations, forming a closed policy network with restricted entry and exit. The KCG, which has provided information about the response process and recorded experiences relating to the marine pollution response, was the center for formulating policy. Local authorities in charge of marine pollution response established the Local Disaster Response Center to frame and adopt plans and policies. The KCG and the local authorities formed the core of the policy network, and the governmental departments were the secondary network to support the response work. In such a closed policy community, only the government sectors were permitted to engage in the process. Par-

tial engagement of the environmental organizations and other nongovernmental organizations was permitted: they could make comments and requests for alternative measures, such as the use of low-temperature and intermediate-pressure cleaners instead of high-temperature and high-pressure cleaners, for banning the oil treatment agent in the shoreline cleanup, and for environmentally friendly options (Rho 2008). Their requests were accepted to a limited extent—for example, the use of low-temperature and intermediate-pressure cleaners.

Meanwhile, the cleanup process revealed the poor quality of cooperation between the government and the private sector, and their mutual mistrust. Such a massive disaster requires a large amount of equipment and personnel to be supplied quickly, and thus the participation of the private sector is essential (Ryu, 2007). Specifically, in the disaster area, improper role assignments among the agencies for the delivery of relief supplies, and the lack of mutual information exchange over the delivery, can trigger problems including duplicate supplies and unfair distribution of supplies (Sung, 2006). Thus, lack of responsiveness to volunteer workers in the field undermines the efficiency of the disaster response. A representative of civic groups, identified in this study as Mr. Y, said that if residents familiar with the area had been engaged in the decision-making process, it would have helped to deploy volunteers to the right places and to manage them effectively. This demonstrates the significance of the people's participation not only in policy implementation but also in decision-making for disaster response.

The Recovery Step: Environmental Recovery and Compensation for Damage

Participants

During the recovery step, after emergency cleanup operations, a working-level council comprising representatives from the public and private sectors held a meeting to discuss ways to resume fishing activities (Korea e-Government's official homepage). The council consists of 24 people, including public officials from the KCG; Chungnam provincial government; Taean-gun Office; Ministry of Food, Agriculture, Forestry, and Fisheries (MIFAFF); Ministry of Land, Transport, and Maritime Affairs (MLTM); Korea Food and Drug Administration; National Fisheries Research and Development Institute; National Fisheries Products Quality Inspection Service; and Korea Ocean Research and Development. Members from the private sector represent the National Federation of Fisheries Cooperatives, resident organizations such as the Association of Taean Fishing Boat Owners, and experts from a cleanup company retained by the foreign insurers. One official said:

> A working-level council is necessary to coordinate various viewpoints on when the cleanup operations should end. The foreign insurers call for an early end to the work because it would reduce the compensation, and insist that they should leave the oil to break down by natural means, while the residents oppose such claims because they want to recover their living environment as soon as possible. That's why a judgment agency is needed. (interview with Mr. L, an official in charge at the Taean-gun Office, May 9, 2008)

Meanwhile, the government did not take any measures for compensation, arguing that the oil spill was a civil liability case with a liable party (The Seoul Shinmun, May 6, 2008). Residents in the affected areas are eligible for support for living expenses from the National Emergency Management Agency (NEMA) within 10 days after a disaster of either natural or human origin. Only in the case of natural disasters, however, does NEMA pay for damages. Those affected by an oil spill claim damages from the one who caused the spill (Kukinews, July 14, 2008). As a result, consultation was conducted between insurers and private organizations such as the Council on Compensation for Damage and the Committee on Compensation for Damage, consisting of tourism and lodging facility owners. The Special Taean Act provided that one committee on compensation for damage should be established, but committees on industrial disaster were formed by field and region (interview with Mr. S from the non-fishing field's committee on compensation for oil spill damage, May 9, 2008).

> Residents are demanding compensation for damage through the Committee on Compensation for Oil Spill Damage, a voluntary organization that deals with calculating, claiming, and receiving damages. Government agencies like the Ministry of Land, Transport, and Maritime Affairs just arrange a meeting between guilty parties and victims or hold meetings for discussion or explanation related to the compensation for damage. (Interview with Mr. S from the Non-Fishing Field's Committee on Compensation for Oil Spill Damage, May 9, 2008)

Meanwhile, NGOs held a news conference after a protest urging the authorities for prompt compensation for damages on January 16, 2008. Those NGOs include People's Solidarity for Participatory Democracy, Public Interest Law Center, Green Korea United, Korea Environmental Litigation Center, Lawyers for Democratic Society, and Environmental Law Center (Yonhapnews, January 16, 2008).

Interactions Among Participants

The public-private joint working-level council, which was set up to determine the ending point of cleanup operations, carried out four on-the-spot inspections—on January

22, February 21, March 8, and March 28, 2008 (South Korean government's official homepage). In terms of compensation, the Committee on Compensation for Oil Spill Damage, organized by local residents, directly consulted with the International Oil Pollution Compensation Funds (IOPC Funds) and other companies (interview with Mr. K, officer of the National Federation of Fisheries Cooperatives, May 9, 2008). Two months after the incident, MOPAS decided to grant 1,500 million won on February 15, 2008, and had a meeting to support those affected in Taean with living expenses (National Emergency Management Agency, 2008). In regard to the compensation, the central government did not take proper action, and contacts with the residents turned out to be barely enough as well. When asked about the frequency of contact with other participants, the National Federation of Fisheries Cooperatives (NFFC), which is in charge of damage investigation, receipt, claims, and litigation for the fishing field, responded with a rating of 5 (very frequently) with the residents and 3 (regularly) with the local authorities. On the direction of the information exchange, the local authorities lack expertise on compensation and are relying on information provided by the NFFC (interview with Mr. K, officer of the National Federation of Fisheries Cooperatives, May 9, 2008). To the same question, the Non-Fishing Field's Committee on Compensation for Oil Spill Damage gave a rating of 5 (very frequently) for contact with residents, 2 (occasionally) for local authorities, and 1 (barely or never) for central government organizations (interview with Mr. S from the Non-Fishing Field's Committee on Compensation for Oil Spill Damage, May 9, 2008). This suggests that the interactions between the government and the private sector were not stronger than those within the private sector. In particular, it turned out that the central government was not able to perform a key role for the policy outcome regarding compensation.

The Structure of the Network

The most important aspects of a network's structure are whether the participants' behaviors are conflictive or cooperative and whether participation in the network is limited or open. Members were divided over the early response to the oil spill and the recovery; some of them insisted that the natural landscape should be returned to its state prior to the incident, while others argued that the ending point of the disaster recovery should be advanced for an early opening of beaches in order to revitalize the local economy (Rho 2008). This disagreement is also confirmed in an interview with a local government officer, who said it wanted to end cleanup operations early to aid the recovery of the regional economy and an early settlement of the incident, but environmental organizations were wary of this attempt. In order to settle the conflicts, a working-level council was established, but participation of the non-governmental sector, including most environmental groups, was limited. NGOs argued that cleanup opera-

tions in the recovery phase must be conducted very carefully and that the policy network related to the cleanup efforts needs to be more open, given that public-private cooperation is necessary for systematic monitoring of the ecosystem and development of measures to recover it (interview with Mr. C from an NGO, May 16, 2008).

In the meantime, the Taean-gun officer identified in this study as Mr. L said that offering the living costs as part of damage compensation has created distress and driven three residents to commit suicide. A member of the Local Disaster Response Center staff, identified in this study as Mr. J, pointed out that the Community Council has limited authority to deal with an insurance company, stressing the necessity of setting up the Task Force Team under the prime minister's office (interview, May 9, 2008). Currently, while the foreign insurance company in charge of the damage compensation has gathered information and responded systematically, the response capability of the Community Council to negotiate the compensation amount seems to be premature. If the residents are not properly compensated in such a process, the burden would be shifted to the residents directly. After the Sea Prince incident, residents claimed an estimated 22.99 million won in damages, but they were only compensated 930,000 won in a decision handed down by the appraisal corporation and the court (The Seoul Shinmun, May 6, 2008), which shows that the real compensation amount could be reduced significantly compared to the damage.[6] Therefore, a large-scale disaster with widespread damage requires a systematic policy network with strong connections, and the central government's cooperation is essential during compensation negotiations.

Interim Conclusion

The working-level council was set up in order to determine the ending point of cleanup operations, but participation in the policy-making process was limited. It is considered that in the recovery step, the policy network was made up in the form of the policy community, like the disaster response step. Still, there is some doubt as to whether the working-level council members designated by the government had the appropriate expertise. Another problem is that the body has no legal basis although its decisions have far-reaching effects. For instance, if the working-level council determines the ending point of cleanup, its decision will result in the fishery resuming and the beaches reopening. Thus, trust and consensus among the parties concerned are needed. In addition, if the cleanup operations are finished, this policy community will

6. In the Sea Prince accident, the average compensation rate was 27%, which is relatively high. In the case of the Geomdong No. 5 oil spill, the victims claimed $91,674,000 in damages, but were compensated only $10,630,000-11.6% of the amount claimed (The Seoul Shinmun, May 6, 2008).

not be able to continue its activities. That is why the public and private sectors, including environmental groups, need to jointly pay continuous attention to the environmental recovery.

Meanwhile, the government insisted that compensation for damage be treated as a civil matter not requiring government intervention, while the private sector called for the government's active participation. In the Erica oil spill, the French government gave up the oil cleanup costs of 179 million euros, so that victims of the oil spill could receive 100% of the assessed compensation from the IOPC (The Seoul Shinmun, May 6, 2008). If an oil spill occurs, while the responsible party takes the required steps systematically along with lawyers and appraisers, victims with limited funds and experience are at a disadvantage (The Seoul Shinmun, May 6, 2008). Therefore, the government is called on to play a role as an active participant, in order to coordinate private organizations' efforts regarding compensation and to minimize a disaster's damage to the public.

CONCLUSIONS

This study focused on the Hebei Spirit oil spill and showed how a policy network was set up and executed for disaster response and recovery. During the emergency cleanup operations, the policy network was established by government officials and private-sector experts. A committee on emergency measures was organized as dictated by law, leading to hierarchical decision-making for cleanup efforts. However, the private sector's participation in the policy-making process was limited. In other words, the policy network for disaster management was made up in the form of a "policy community," the most closed type of network. Massive disasters need urgent countermeasures to prevent secondary damage and reduce any ripple effect. In order to increase the efficiency of disaster recovery and check the "veto power" caused by the nongovernmental sector, early policy-making is considered to have a closed and vertical form. Some scholars, however, argue that disaster management can be more effective in horizontal relationships than vertical ones, because the horizontal form, in which residents, private organizations, and government officials participate together, has more structural flexibility (Lee & Choi, 2008). In the case of Hebei Spirit, the residents' opinions were more accurate than those of the government about the estimated oil spill rate, since they were well acquainted with geographical features in the damaged area. Therefore, a policy network should include the residents and encourage them to participate in emergency cleanup decisions.

Meanwhile, not only the government sector but also environmental NGOs, resi-

dents, and volunteers participated in the recovery, and the type of network was the issue network, which has a loose and open structure. By April 25, 2008, a total of 1.76 million people had taken part in the cleanup efforts on the contaminated coast, and 1.11 million of them were volunteers (Taean-gun 2008). Volunteer activities tend to be temporary and unorganized. This loose network structure caused some chaos and inefficiency, especially in the early stage. In order to fully utilize the resources in a policy network, a more permanent system would be an option. It would help coordinate various participants and help them exchange information and cooperate closely even in the early stages of a disaster response.

In terms of long-term recovery, conflicts occurred in deciding the ending point for cleanup and compensation for damage. The Taean community is faced with a social crisis as the community goes through severe internal conflicts regarding compensation, resulting in a loss of mutual trust (Lee, 2008). A conflict management system should be utilized to prevent the breakdown of the community. Also, the government as an official participant is required to play a central role as an active arbitrator advocating for the victims of the disaster, who are vulnerable, during negotiations for damage compensation between insurance companies and disaster victims. In order to carry out long-term recovery from the disaster and ongoing environmental monitoring, a new system is needed in which the participants can discuss measures for environmental recovery through formation of a comprehensive network including environmental specialists from the private sector. Establishing such a network requires allowing public participation in policy-making as well as shifting public officials' perception of civic groups' criticism as a nuisance.

As discussed above, the disaster management policy network demonstrated two different approaches during the response (policy-making and execution) and recovery steps respectively. Therefore, it is necessary to examine each step of the disaster and individual issues separately, rather than determine a general definition for the disaster management policy networks. The Hebei Spirit oil spill showed that different types of participants and structures were formed in each network for emergency cleanup, on-site response, compensation for damage, and recovery of the environment, and different issues presented different problems. In order to achieve effective disaster management in the future, it is necessary to study conditions and organize a suitable policy network for each stage.

This study, using small interviews to analyze the interactions of policy network participants, has methodological limitations in terms of representativeness of the population. It is considered that a full and continued investigation of the Hebei Spirit oil spill would be conducive to analyzing the policy networks according to each stage of disaster management.

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