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Issue Analysis of disaster management resources

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A B S T R A C T

Disasters have complex and diverse causes, and it is difficult to prevent and respond in advance. In addition, there is a high possibility that it can spread to a national crisis due to large-scale damage and secondary damage. Therefore, to minimize the damage, the system should be in place to immediately put disaster management resources on the scene. The purpose of this study is to provide basic data for the development of improvement plans for disaster management resource operation by identifying issues newly derived through disaster management resource issue analysis. As for the research method, social network analysis was performed focusing on issue data of social media for the last 8 years (2014~2021) for disaster management resources. The results of the study are as follows: First, looking at the trend in the number of mentioned issues, there is a correlation with the occurrence of events that reflect seasonal and geographic characteristics. Second, perceptions of disaster management responsible organizations and leading organizations were analyzed. Third, appraisal words reflecting the expected effects of disaster management resources were analyzed, and negative appraisals were also analyzed.

Key words: disaster management resource; issue analysis; crisis management

1. Introduction

In modern society, environmental changes led by climate change and risk factors from social changes such as urbanization, industrialization, and population density interact with each other, and large-scale disasters or new types of disasters occur frequently around the world. In other words, disasters in modern society include traditional disasters that continuously cause great damage such as fires, collapses, explosions, road traffic accidents, and wind and flood damage, as well as the spread of infectious diseases that did not occur in the past, chemical accidents, railway and subway accidents, communication and energy-related disasters including the paralysis of supply facilities are occurring(Seoul Institute, 2020: 4).

Because the causes of disasters are complex and diverse, and there are potential factors in various places, the predictability is low, making it difficult to prevent and respond in advance, and the possibility of spreading into a national crisis due to large-scale damage and secondary damage has increased. Therefore, a response to minimize disaster damage should be considered first. To this end, a system that can immediately put disaster management resources such as materials, equipment, and manpower on the site is required(Lee, 2012: 286; Lee *et. al.*, 2015: 377).

Issue analysis can be confirmed as the effects of disasters in response to social contexts. As a result, these emerging issues come to the surface through the perception of society. In other words, observing and analyzing issues enables us to understand the context of the impacted parts as well as the incidental parts of the disaster. Moreover, it is possible to analyze not only the type of disaster, but also the phenomenon that varies depending on the social context and conditions as the disaster progresses(Choi, 2010).

In the analysis of issues centered on existing incidents, issue analysis research on disaster management resources is considered to be a novel type of disaster research. Big data issue analysis using SNS provides useful information to obtain public situational awareness of related issues and to improve the limits of the issues(Zheye & Xinyue: 2018). Therefore, the purpose of this study is to provide basic data for the development of improvement measures for disaster management resources by analyzing social media issue data for the last 8 years (2014 to 2021).

2. Theoretical Background

2.1. Issue analysis

An issue is a dictionary definition of 'social or political concern or problem that is talked about in the population'. Such an issue becomes meaningful as an issue only when information sharing and exchange of opinions between people occurs on a certain topic(Kim, 2014: 2).

Choi, Hee-Cheon(2010) defines an issue as a task that needs to be dealt with by attracting the attention of society, and explains that the social issue becomes a public agenda and ultimately becomes a policy. In particular, in disasters, the government and other actors all become the main agents to solve the issues. Therefore, the disaster management resource issue is a task that needs to be dealt with by society in which the impactful part of the disaster is materialized and attracts attention.

Currently, most research on disaster management resources involves establishing a new resource management system for rapid mobilization and utilization of resources in a disaster or suggesting a system improvement plan for effective management. However, disaster management resources-related issue analysis studies have hardly progressed.

In this study, it was considered that if an issue analysis of disaster management resources rather than the contents previously studied was conducted, a new research method could be obtained.

Information is a key resource for all human actions, judgments, and choices, and is a signal and rule that moves people and resources. Hence, information is essential in the entire process of disaster prevention, preparedness, response, and recovery, in support, delivery, coordination, participation of all walks of life, monitoring, and evaluation of human and material resources(Kim & Lyu, 2015). Therefore, though analysis of disaster management resources, newly derived issues can be novel information.

2.2. A study on disaster management resources

Disaster management resource is a compound word of 'disaster management' and 'resource', and most domestic researchers are citing the definition of disaster management resource in the current legal system. Accordingly, in this study, as in previous studies, the disaster management resource is defined through a conceptual review of the legal system.

Article 34 of the「Framework Act On the Management of Disasters and Safety」defines disaster management resources as equipment, materials, materials and facilities required by the Presidential Decree necessary for disaster management activities. Furthermore, in Article 43 of the Enforcement Decree of the same Act, disaster management resources are provided for flood protection materials, construction materials, electrical/communication/water supply equipment, transportation equipment and fuel for transporting materials and manpower, construction equipment, flooded area recovery equipment, and disaster emergency measures. It is specified as small equipment, facilities for treatment or isolation, facilities for relief, and other equipment, materials, materials and facilities announced by the Minister of the Interior and Safety.

As a study on the establishment of a management system for disaster management resources, the Disaster Prevention and Management Research Center (2016) selected and classified social disaster management resources through relevant domestic and foreign case analysis, and suggested improvement of the legal system.

In this research results, the unification of the names and terminology of disaster management resources that are used differently by each institution, and the preparation of classification criteria to distinguish between shared and individually used resources in the disaster management resource shared utilization system were suggested as improvement measures.

Jung, Wooyoung *et. al*.(2013: 65) conducted a study on the current state of operation of disaster prevention resources in Korea and overseas case studies such as the United States to more systematically manage disaster prevention resources individually managed by the governments, regional, military, and private sectors. classification, standardization, and establishment of an integrated information system were emphasized.

In the study on the improvement of the management system of disaster management resources, Lee, Un(2020) presented a method to improve the management system through a legal comparative study between disaster management resource management systems in the United States, Japan, and the United Kingdom. As a result of the study, it was pointed out that the resources and equipment managed through agreements with private organizations are not mobilized and secured in the required quantity at the time they are needed.

Jang, Dae Won et. al.,(2020) suggested five problems in Korea's disaster management resource management system. First, the stockpile and management system of disaster management resources: There are too many types of items to manage, making it difficult to select and concentrate on resource management. Second, lack of resources: Response and recovery of disasters are delayed due to insufficient holding of essential resources for each type of disaster. Third, low utilization of resources: Resources whose functions and performance have disappeared or have deteriorated cannot be used for appropriate purposes. Fourth, resource mobilization delay: Resource mobilization is delayed due to poor

access to stockpiles and disaster-affected areas or lack of resource information sharing between first responders and the situation room. Fifth, it was pointed out that the currentiz ation of resource information and the handover of duties due to rotational positions were insufficient due to the excessive workload of the person in charge of resource management at each institution.

In case of disaster, physical, mental, and material damage occurs. It must satisfy the diverse requests of disaster victims with different vulnerabilities for the end of the disaster and return to daily life (Kim & Kwon, 2021: 294). In order to respond quickly to these needs, research on ways to increase access to disaster management resources should be sought.

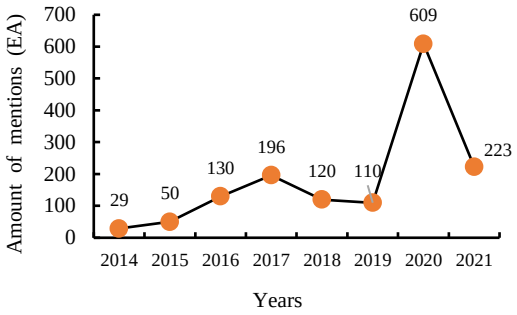
3. Research methods

Disaster management resource issue analysis was conducted focusing on data from the last 8 years (2014 to 2021). Analyzed data was obtained from internet news and SNS including Twitter, blog, Instagram and representative community website). And then, interest in disaster management resources (scale and quantity of mentions, etc.), related words, and emotional words (positive words and negative wor ds) were analyzed. For qualitative and quantitative analysis, Sometrend, social big-data network program, (VAIV, Seoul, Korea) was exploited from June 01 to June 30, 2022.

4. Analysis results

4.1. Analysis of interest in disaster management resources

<Figure 1> shows the amount of mention of disaster management resource issues based on data for the last 8 years (2014 to 2021).



<Figure 1> Analysis of the amount of mention of disaster management resources

The amount of mention of disaster management resources has been steadily increasing from 2014 to 2017. Although it decreased slightly in 2018 and 2019, the number of mentions increased by more than 4 times compared to 29 cases in 2014.

In particular, in 2020, disaster management resources were mentioned 609 times, an increase of 335.45% compared to the previous year. Under the influence of 13 lawmakers co-initiated the amendment to 「Framework Act On the Management of Disasters and Safety」, the medical community reacted furiously.

Next, <Table 1> shows the results of analyzing the trend of mentions of disaster management resources by year/month.

<Table 1> Analysis of the amount of mention of disaster management resources by year

Division	2014	2015	2016	2017	2018	2019	2020	2021
Jan.	-	1	8	26	14	1	2	30
Feb.	5	3	1	23	-	1	2	83
Mar.	-	2	14	26	5	6	1	5
Apr.	16	1	6	7	6	10	32	2
May.	2	18	40	18	33	6	14	17
Jun.	1	-	11	14	7	15	59	13
Jul.	1	-	-	31	22	25	15	9
Aug.	-	1	5	5	6	3	221	10
Sep.	-	1	-	7	-	3	109	15
Oct.	1	11	30	24	8	22	107	19
Nov.	1	4	11	9	18	13	19	11
Dec.	2	8	4	6	1	5	28	9

Generally, it is analyzed that the amount of mention of disaster management resources increases in summer, when a lot of damage from natural disasters such as heavy rain, floods, and typhoons occur, and the amount of mention of disaster management resources increases in winter, when seasonal safety accidents such as heavy snow and cold waves increase.

Among them, the reasons for the dramatic increase in mentions in April 2014, June 2016, and August 2020 are as follows. First, in the case of April 2014, it was analyzed as the effect that the Fire and Disaster Prevention Administration placed an order for the first project to establish a pan-government integrated disaster safety system including the establishment of a disaster management resource joint utilization system(DRSS) (Electronic Newspaper: 2014).

Second, in the case of May 2016, it is analyzed that it was the effect of mobilizing disaster management resources in 17 cities/provinces and 36 cities/guns/gus during the SKX: Safe Korea Exercise period from the 16th to the 20th. During the training period, the process of mobilizing resources necessary for disaster response is checked quickly and systematically, and the 209 cities/provinces and cities/counties/districts that do not conduct disaster management resource mobilization training have a Disaster Resource Sharing (DRSS) system. System) training was conducted to master the skills such as requesting resource support and approval (NEWSIS, 2016).

Third, in the case of August 2020, the 'Act on the Promotion of Inter-Korean Health and Medical Exchanges and Cooperation' to provide emergency support to South Korean medical personnel in the event of a disaster in North Korea and 'to include doctors and other human resources in the disaster management resource' It is analyzed as the effect of the proposal of 'Amendment to the Framework Act on Disaster Management'. Both bills have been controversial in connection with the group action against the 2020 medical policy promotion.

4.2. Disaster management resource related word analysis

<Table 2> shows the results of analyzing the top 20 related words among disaster management resource issues.

<Table 2> Analysis of the highest related words

Ranking	2014		2015		2016		2017	
1	Response	14	Response	16	Response	47	Response	66
2	Information	11	Safety	15	Exercise	45	Resource	65
3	Incheon	10	Ministry of Public Safety and Security	14	Safety	44	Ministry of Public Safety and Security	55
4	NEMA	9	Ability	12	Disaster response	37	Safety	49
5	National Emergency Management	9	Exercise	11	Resource	34	System	41
6	Safety	9	Large Scale	11	System	30	Revention	40
7	Share	8	Coast	11	Support	28	Exercise	39
8	Open	7	SafeKorea Exercise	9	Ministry of Public Safety and Security	24	Plan	34
9	Disaster information	7	Disaster response	9	Mobilization	23	Support	28
10	National Information Society Agency	7	Government Department	9	SafeKorea Exercise	22	Large Scale	25
11	Disaster response	7	Resource	8	Typoon	18	Emergency Operation	24
12	Strategy	7	Fire engine	8	Large Scale	17	Recovery	24
13	Recovery	7	Street	8	Function	16	Operation	24
14	Resource	6	Incheon	8	Recovery	15	Korea Forest Service	23
15	Task	6	Gyeonggi	8	Government Department	14	Livestock	22

16	Business	6	Government Office	8	Fire	14	Type	22
17	People	6	Fire	7	Cooperation	13	Resident	22
18	System	6	People	7	Earthquake	12	Manual	20
19	Nam Sang-ho	5	Earthquake	7	Seoul	12	Evaluation	20
20	Cooperation	5	Local Government	7	Coastal Guard	11	Interest	20
Ranking	2018		2019		2020		2021	
1	Safety	46	Recovery	31	Safety	221	Busniness	109
2	Response	44	Safety	29	Manpower	203	Ministry of the Interior and Safety	69
3	Ministry of the Interior and Safety	33	Response	25	Quarantine	172	MOIS	52
4	Exercise	31	Resourse	25	Mask	165	Budget	49
5	Earthquake	26	Ministry of the Interior and Safety	25	Resource	156	Economics	46
6	Fire	25	Cooperation	23	Doctor	137	Warehouse	44
7	Disaster response	25	Exercise	22	Government	131	Ignition	43
8	SafeKorea Exercise	24	Typoon	20	Bill	125	Resource	41
9	Resource	23	Plan	17	MOIS	121	Supplementary budget	40
10	MOIS	21	Flooding	16	HWANG Unha	115	Maeil Business	40
11	Prevention	20	Fire	15	Government Office	109	Report	40
12	System	19	Safety Measure	15	Result	108	Emergency relief grant	40
13	Recovery	15	House	15	Service	106	SupportFund	40
14	Evaluation	15	Gwangju	15	Response	104	Installation	39
15	Support	15	Disaster response	14	Article	104	Response	37
16	People	14	Pusan	14	Public sevice	103	System	36
17	Golden TIme	13	Jeju	13	Local Government	99	Contract	35
18	Meeting	13	Education	12	People Power Party	99	Local Government	33
19	Government Department	13	Public corporation	12	Assemblyman	95	Initially	31
20	Public Servant	13	Danas	11	Public Goods	78	Logistics	26

Specifically, the related words of disaster management resource issues by year have the following characteristics.

First, related words related to the four-step theory of disaster management appear. Disaster management resources are resources necessary for the management of various disasters, and since an annual stockpile management plan must be established and promptly mobilized, there are related words related to the disaster management stage such as 'prevention', 'response' and 'recovery'. analyzed.

Second, related words related to the region appear. Relations with local governments that promote strategies such as the establishment, inspection, and education/training of an integrated disaster management resource storage center such as ‘Incheon’, ‘Gyeonggi province’, ‘Seoul’, ‘Gwangju’, ‘Busan’, and ‘Jeju province’ were analyzed.

Third, the names of the organization in charge of disaster management and the organization in charge of disaster management came out as related words.

Central administrative agencies and local governments, local administrative agencies, public institutions, Relations prescribed by Presidential Decree with institutions prescribed by Presidential Decree,

such as public organizations and management institutions of important facilities subject to disaster management, and tasks such as prevention, preparation, response, and recovery for each type of disaster or other accidents The names of central administrative agencies were analyzed as related words.

4.3. Disaster management resource issue analysis

<Table 3> shows the results of analyzing the positive and negative words of the disaster management resource issue to the top 10 by year.

<Table 3> Analysis of emotional words

Ranking	2014				2015			
	Positive		Negative		Positive		Negative	
1	Safety	9	Damage	2	Safety	15	Damage	5
2	Construct the Infrastructure	4	Slow	1	Effective	8	State of Emergency	2
3	Various type	4			Efficient	5	Low grade	1
4	Intuitive	3			Fast	4		
5	Service is available	3			Manage	3		
6	Efficient	3			Systematic	3		
7	Fast	3			Environment Improvement	2		
8	Service Add	2			Appreciate	1		
9	Systematic	2			Raise efficiency	1		
10	Active	2						
Ranking	2016				2017			
	Positive		Negative		Positive		Negative	
1	Safety	44	Damage	11	Manage	76	Damage	13
2	Fast	18	Crime	2	Safety	49	Hazard	9
3	Manage	16	Lack	2	Improve	30	High price	3
4	Systematic	8	Embarrass	1	Systematic	14	anxiety	2
5	Contribute	7			Contribute	9	Fear	1
6	Effective	6			F	9	Be limited	1
7	Do one's best	4			Do one's best	8		
8	Catch eye	3			Best	7		
9	Expect	3			Be maintained	6		
10	Efficient	3			Supply	6		
Ranking	2018				2019			
	Positive		Negative		Positive		Negative	
1	Safety	46	Lack	12	Safety	29	Damage	21
2	Do one's best	9	Havoc	6	Manage	10	Insufficient	6
3	Regard	6	Damage	4	Do one's best	7	Deviation	4
4	Gain honors	5	Damage of Human Life	4	Excellent evaluation	5	State of Emergency	4
5	Various type	4			Improve	5	Accident occurrence	3

6	Attract one's attention	4			Excellent	4	Damage of Human Life	2
7	High Score	4			Various experience	4	Huge problem	2
8	Contribute	3			Get a perfect score	4	Get the damage	1
9	Best	3			Excellent evaluation	3		
10	Systematic	3			High point	3		
Ranking	2020				2021			
	Positive		Negative		Positive		Negative	
1	Manage	286	argument	58	Manage	108	Congested	7
2	Safety	221	be useless	30	make effort	23	Damage	6
3	Efficient	24	Concern	22	Safety	20	Weak	4
4	Systematic	18	Damage	19	Stable	20	Hazard	3
5	Fresh	12	Disagress	18	optimum	13	Have problem	2
6	Active	10	Resist	15	Successful	12	emergence of a problem	2
7	Be maintained	9	Lack	10	Effective	11	Difficulty	1
8	Being stable	9	criticism	8	Relax	8	Get the damage	1
9	Positive	9	oppose	8	Expection	7		
10	Best	8	be blamed	7	Systematic	6		

Specifically, the appraisal words for disaster management resource issues by year have the following characteristics. First, appraisal words related to the expected effect of disaster management resources were analyzed. 'Rapid', 'Managed', 'Systematic', 'Active', 'Complement', 'High Score', 'Good Rating', 'Enhance', 'Excellent', 'Fresh', 'Stable' Through positive appraisal words such as ' and 'optimal', words that can read the expectations of disaster management responsibilities and management organizations and the public in the issue of disaster management resources were analyzed.

Second, emotional words reflecting the fear of disasters were analyzed as negative words. Commonly found in negative sentiment words such as 'damage', 'crime', 'danger', 'anxiety', 'worried', 'revolt', 'lack', 'complex', 'vulnerable', 'risk' Emotional words related to human fear of visible disasters were analyzed.

5. Conclusions

The purpose of this study is to provide basic data for policy development in the field of disaster management resources through issues newly derived through issue analysis on disaster management resources. The research results are as follows. First, looking at the trend in the amount of mention of disaster resource management issues, it has relation to the occurrence of specific events. It was analyzed that awareness of disaster management resources increases especially when disasters that reflect seasonal and geographical characteristics are predicted and occurred.

Second, perceptions of disaster management responsible organizations and leading organizations were analyzed. Public perceptions regarding the responsible and leading organizations related to disaster management resources such as 'Ministry of Public Administration and Security', 'Forest Service', 'Seoul', and 'Gyeonggi province' were analyzed. It is considered that the mentioned institutions can obtain positive recognition and public cooperation and help. In addition, organizations not mentioned should systematically stockpile and manage disaster management resources to resolve disaster inequality among the people and mobilize them promptly in the event of a disaster.

Third, sentimental words reflecting the expected effects of disaster management resources were analyzed, and words that induce negative emotions were also analyzed. Sentiment words reflecting expectations for disaster management resources such as 'quick', 'systematic', 'fresh', and 'stable' were analyzed, while negative emotions such as 'anxiety', 'worried' and 'complex' were analyzed. Words that induce Negative words have been analyzed, but since the percentage of positives is higher, efforts

should be made to meet the expectations and demands of the people and make the Republic of Korea safe.

In a disaster situation, disaster management agencies and leading organizations should quickly identify and provide necessary disaster management resources, thereby contributing to the minimization of damage to people's lives and property. For this, cooperation and cooperation of each institution is required.

A vocabulary-based approach in disaster data is being developed as a strategy for effective information management in a rapidly changing disaster environment(Ragini, *et. al.*, 2018). Also, it is known that emotional words in crisis management communication have a positive effect on organizational communication in crisis management(Meer & Verhoeven, 2014; Lu & Huang, 2018).

Therefore, it is expected that improvement plans for the efficient operation of disaster management resources will be derived by analyzing the perceptions and issues of the people in charge of disaster management resources and the public along with the basic data of this thesis.

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Profile

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