Inter-Organizational Partnering Strategies in Disaster Response

Subjects: Public Administration

Contributor: Chenyu Liu , Qian Shi

Establishing appropriate inter-organizational partnership in disaster response is of great help to the improvement of disaster relief performance. The optimal partnering strategy is contingent on disaster response conditions, with accurate disaster information and abundant relief materials to choose the material difference principle, and vague disaster information to choose the organizational influence principle. At the same time, frequent information communication and material cooperation allocation can be transformed into low-frequency information communication and government-led material allocation.

disaster response inter-organizational partnering strategy partnering principle partnering scope complex network

1. Introduction

With the changes in human behavior and natural environment in the process of economic and social development, the world is facing an unprecedented ‘dangerous situation’. The Global Assessment Report issued by the United Nations pointed out that under the impact of disasters, the social and economic progress achieved by the world will fall short by 2030, and disasters will occur in every corner of the world at a frequency of 1.5 per day [1]. Due to the increasing correlation and dependence between different economic and social subsystems, the impact of disaster events is becoming more and more severe. The complexity of disaster response stems from the rapid influx of massive relief organizations, under extremely tight time and resource constraints [2]. The response organizations can include government departments, non-governmental organizations (NGO), volunteer groups, and even the public and the media [3][4].

In the disaster response process, the government, as the main participant relief process, needs to cooperate with large numbers of response organizations. In order to make up for the lack of disaster relief capabilities of a single organization, the government will screen relief organizations with a certain partnering principle [5], and select corresponding organizations to establish partnership [6]. Response organizations chosen by the government will cooperate and exchange tangible and intangible resources with the government. Tangible resources can be emergency supplies, funds, vehicles, or other shared equipment, while intangible resources mostly refer to disaster information and disaster relief knowledge [7]. It is necessary to determine the appropriate partnering scope with the partner organizations.

2. Inter-Organizational Partnering Strategies in Disaster Response

2.1. Partnering Principles in Disaster Response Organizing

Organizational influence is a key factor when partnerships with disaster response organizations are established [8]. Response organizations tend to establish cooperative relationships with central organizations with greater influence, which is called the influence-centered principle. In complex network research, the center of influence strategy, also known as the preferential attachment effect, refers to the tendency that more popular organizations with more existing cooperative relationships will obtain more cooperation over time [9]. Partnering with high-impact organizations can bring many positive effects, which are beneficial to the basic factors such as cost-effectiveness of the organization operation, material flow, and information flow. More influential organizations often have more credibility, leadership, professional skills, and resource reserves [10]. Therefore, establishing cooperative relationships with high-impact organizations is given priority, and organizational influence orientation is also one of the main principles for government agencies to establish cooperative relationships.

The rapid and sudden characteristics of disaster pose a great challenge to the emergency material reserves of government agencies. Government agencies usually do not have sufficient types of material reserves, and some types of materials are not found to be in shortage until the disaster develops to a certain stage [11]. From the perspective of relief reserves and supplies, the government is also actively seeking to establish cooperative relationships with other response organizations. Some relief organizations may be lacking in the number of resources, but may reserve non-common resources. Larger emergency relief organizations can often provide more resources due to their well-established supply chains and greater warehousing inputs [12][13][14]. Therefore, when establishing cooperative relationships with emergency relief organizations, government agencies will consider the types and quantities of supplies. The material difference is also an important principle for the government to establish partnerships with disaster relief organizations.

The occurrence of disasters often has impacts on local communication infrastructure and network facilities. It is difficult for any organization to make accurate judgments on the disaster-affected areas [15]. At the same time, emergency relief has extremely high requirements on timeliness and accuracy of information [16]. A few seconds may mean important losses of people's lives and property. After a disaster occurs, government agencies that cannot fully grasp disaster information will seek disaster information sources from other disaster relief organizations. Some local disaster relief organizations that have local information would be chosen [17]. Information accuracy becomes a key principle to establish disaster cooperation.

2.2. Partnering Scopes of Disaster Response Organizations

Disaster relief material and information cooperation is the most important and typical way of cooperation between partner organizations in disaster response [18]. In disaster relief, the allocation of materials is the key to the successful completion of disaster relief. The government and other disaster relief organizations can cooperate on

material collection and inventory, material classification and distribution, material transportation, material management, and supervision in material allocation [19][20]. For example, in terms of material classification and distribution, the government can organize professionals to classify the collected materials and then distribute them according to the actual needs of the disaster area, while other disaster relief organizations can also send professionals to participate in the sorting and distribution of supplies. In short, through the cooperation of the government and other disaster relief organizations, the allocation of materials can be more efficient and orderly. Urgently needed materials can be sent to disaster areas in the shortest time to provide urgent rescue for the residents in disaster areas.

The transmission and sharing of information is another crucial task, and accurate disaster information plays a key role in the effect of emergency disaster relief [21][22]. Especially at the beginning of unconventional emergencies, the demand for information is enormous, which leads to cooperation on information sharing. Governments and other disaster relief organizations can cooperate on disaster relief information collection, aggregation, and release [23][24]. On the one hand, the government can collect disaster information through various channels, including investigating the situation of the disaster area and collecting the needs of the victims [25]. Disaster relief organizations can conduct information collection and aggregation in their own field, and share this information with the government and other disaster relief organizations [26]. On the other hand, the government can release the latest disaster information, rescue progress, response measures and other information on official media, and provide necessary information support to others. Disaster relief organizations can publish the latest disaster information on their official media, and provide necessary information support to the government [27].

Through the cooperation between the government and other disaster relief organizations in disaster relief information, it is possible to understand the disaster situation more efficiently and accurately. Additionally, grasping the progress of rescue and adjusting the response measures can be conducted in a timely manner [28]. However, excessive information exchange and repeated information sharing may also waste the time of repeated communication, and even make the implementation of emergency relief activities improper [29][30]. Therefore, when government agencies establish cooperation with disaster relief organizations, they can selectively exchange disaster information with some organizations, instead of communicating information with all cooperative organizations. After the occurrence of unconventional emergencies, the sharply increased demand for materials makes the financing of emergency materials the most important task. More accurate disaster demand information is an important basis for the distribution of emergency materials. All in all, for different emergency relief organizations, it is necessary to selectively carry out the cooperative supply of emergency supplies or the sharing of disaster information, that is, to choose the optimal organizational cooperation scope for materials and information resources, rather than a generalized all-round cooperation.

References

1. United Nations Office for Disaster Risk Reduction (UNDRR). Global Assessment Report on Disaster Risk Reduction. 2022. Available online: https://www.undrr.org/gar/gar2022-our-world-risk-gar#container-downloads (accessed on 16 April 2023).
2. Nowell, B.; Steelman, T.; Velez, A.L.K.; Yang, Z. The structure of effective governance of disaster response networks: Insights from the field. Am. Rev. Public Adm. 2018, 48, 699–715.
3. Kapucu, N.; Garayev, V. Structure and network performance: Horizontal and vertical networks in emergency management. Adm. Soc. 2016, 48, 931–961.
4. Akter, S.; Wamba, S.F. Big data and disaster management: A systematic review and agenda for future research. Ann. Oper. Res. 2019, 283, 939–959.
5. Fontainha, T.C.; Leiras, A.; Bandeira, R.D.; Scavarda, L.F. Public-private-people relationship stakeholder model for disaster and humanitarian operations. Int. J. Disaster Risk Reduct. 2017, 22, 371–386.
6. Tao, Z.G.; Zhang, H.B. Partnering strategies of organizational networks in complex environment of disaster in the centralized political context. Complexity 2020, 1, 9687390.
7. Kalkman, J.P.; De Waard, E.J. Inter-organizational disaster management projects: Finding the middle way between trust and control. Int. J. Proj. Manag. 2017, 35, 889–899.
8. Coles, J.B.; Zhang, J.; Zhuang, J. Partner selection in disaster relief: Partnership formation in the presence of incompatible agencies. Int. J. Disaster Risk Reduct. 2018, 27, 94–104.
9. Guo, X.S.; Kapucu, N. Examining collaborative disaster response in China: Network perspectives. Nat. Hazards 2015, 79, 1773–1789.
10. Curtis, C.A. Organizational networks in times of crisis: Lessons from Katrina. J. Cont. Crisis Manag. 2018, 26, 202–211.
11. Jung, K.J.; Song, M.S. Linking emergency management networks to disaster resilience: Bonding and bridging strategy in hierarchical or horizontal collaboration networks. Qual. Quant. 2015, 49, 1465–1483.
12. Tofighi, S.; Torabi, S.A.; Mansouri, S.A. Humanitarian logistics network design under mixed uncertainty. Eur. J. Oper. Res. 2016, 250, 239–250.
13. Kapucu, N.; Hu, Q. Understanding multiplexity of collaborative emergency management networks. Amer. Rev. Public Adm. 2016, 46, 399–417.
14. Chen, Z.; Chen, X.; Deng, J. Approach to disaster relief: Emergency management system in cities of China. Disaster Adv. 2010, 3, 96–98.
15. Sinha, A.; Kumar, P.; Rana, N.P.; Dwivedi, Y.K. Impact of internet of things (IoT) in disaster management: A task-technology fit perspective. Ann. Oper. Res. 2019, 283, 759–794.

16. Aros, S.K.; Gibbons, D.E. Exploring communication media options in an inter-organizational disaster response coordination network using agent-based simulation. Eur. J. Oper. Res. 2018, 269, 451–465.
17. Mete, H.O.; Zabinsky, Z.B. Stochastic optimization of medical supply location and distribution in disaster management. Int. J. Prod. Econ. 2010, 126, 76–84.
18. Gupta, S.; Starr, M.K.; Farahani, R.Z.; Matinrad, N. Disaster management from a POM perspective: Mapping a new domain. Prod. Oper. Manag. 2016, 25, 1611–1637.
19. Chen, W.; Zhang, H.B.; Comfort, L.K.; Tao, Z. Exploring complex adaptive networks in the aftermath of the 2008 Wenchuan earthquake in China. Saf. Sci. 2020, 125, 104607.
20. Rawls, C.G.; Turnquist, M.A. Pre-positioning of emergency supplies for disaster response. Transp. Res. Part B Methodol. 2010, 44, 521–534.
21. Bharosa, N.; Lee, J.; Janssen, M. Challenges and obstacles in sharing and coordinating information during multi-agency disaster response: Propositions from field exercises. Inf. Syst. Front. 2010, 12, 49–65.
22. Vosooghidizaji, M.; Taghipour, A.; Canel-Depitre, B. Supply chain coordination under information asymmetry: A review. Int. J. Prod. Res. 2020, 58, 1805–1834.
23. Feiock, R.C.; Lee, I.W.; Park, H.J.; Lee, K.H. Collaboration networks among local elected officials: Information, commitment, and risk aversion. Urban Aff. Rev. 2010, 46, 241–262.
24. Comfort, L.K.; Ko, K.; Zagorecki, A. Coordination in rapidly evolving disaster response systems: The role of information. Am. Behav. Sci. 2004, 48, 295–313.
25. Jung, K.; Park, H.W. Tracing interorganizational information networks during emergency response period: A webometric approach to the 2012 Gumi chemical spill in South Korea. Gov. Inf. Q. 2016, 33, 133–141.
26. Steelman, T.A.; Nowell, B.; Bayoumi, D.; McCaffrey, S. Understanding information exchange during disaster response: Methodological insights from infocentric analysis. Adm. Soc. 2014, 46, 707–743.
27. Medel, K.; Kousar, R.; Masood, T. A collaboration-resilience framework for disaster management supply networks: A case study of the Philippines. J. Humanist. Logist. Supply Chain Manag. 2020, 10, 509–553.
28. Behl, A.; Dutta, P. Humanitarian supply chain management: A thematic literature review and future directions of research. Ann. Oper. Res. 2019, 283, 1001–1044.
29. Sentia, P.D.; Shukor, S.A.; Wahab, A.N.A.; Mukhtar, M. Logistic distribution in humanitarian supply chain management: A thematic literature review and future research. Ann. Oper. Res. 2023, 323, 175–201.

30. Lu, Y.; Zhan, C.Y.; Li, R.; Su, M. An NGO disaster relief network for small and medium-scale natural hazards in China. Nat. Hazards 2021, 106, 2689–2709.