An NGO disaster relief network for small and medium-scale natural hazards in China

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Abstract

As China is one of the world's most vulnerable countries to small and medium-scale natural hazards (SMNHs), its NGOs have had a great deal of experience in dealing with disaster relief, especially since the 2008 Wenchuan Earthquake; however, there have been few studies that have comprehensively examined China's NGO disaster relief networks (NDRNs). One Foundation (OF), which is one of the most active public-fund raising foundations in China, has been engaged in developing a nationwide NDRN made up of 20 independently operating provincial networks that are focused on SMNHs. This paper explored the structures, operations and challenges in the representative North-Sichuan network, from which the following key factors for sustainable NDRNs were identified: (1) a combined hierarchical and networked organizational structure; and (2) a coordinated external and internal network operations mechanism that has a specific entry threshold to ensure healthy network expansion, periodic member NGO training to enhance network capacity, and reciprocal and cooperative government-NGO relationships. These findings provide a useful reference for the establishment and development of NDRNs in other countries.

Keywords NGOs · Disaster relief network · China · Small and medium-scale natural hazards

1 Introduction

NGOs play a vital role in global disaster relief (Kapucu 2007). For example, when the 1995 Kobe earthquake struck, hundreds of NGOs joined the relief and reconstruction efforts (Iizuka 2018), in the 2008 Wenchuan earthquake, NGOs provided invaluable relief and reconstruction assistance (Xu et al. 2017), and in the 2010 Haiti earthquake, there was a massive NGO response (Kirsch et al. 2012). However, when these NGOs flood into disaster areas, they face challenges that often limit the roles they can play. Reviews of NGO disaster relief operations have identified three main challenges, as detailed in the following.

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Many NGOs lack coordination. As the significant NGO volunteer base generally has little training or professional experience, inter-NGO cooperation failures have been common (Murdie 2013; Albahari and Schultz 2017). However, this NGO failure to ensure effective practice can result in secondary damage that can add to rather than relieve the problems being faced by the disaster victims (Teets 2009; Levie et al. 2017). Hillig and Connell (2018) specifically highlighted the lack of adequate coordination between some NGOs after the 2015 Nepal earthquake (Hillig and Connell 2018), claiming that as “many just came and distributed tarpaulins and went back” (p. 316), there was a duplication of services.

Ineffectual cooperation can threaten operations. When the Ms 8.0 Wenchuan earthquake struck western China in 2008, some of the many NGOs that swarmed into the area sought to form NGO, for-profit, and local government partnerships (Hu et al. 2016). However, disorganized participation appeared to be the norm, possibly because of the trust deficits within these alliances (Teets 2009; Espia and Fernandez 2015), which often resulted in poor to no information exchange between the relief workers (Tierney et al. 2005; Hillig and Connell 2018) and severely affected the NGO disaster relief efficiency.

NGO disaster relief operations are often unsustainable. NGOs usually establish alliances with the initial aim of providing joint responses to the disaster; however, these NGO alliances often struggle to sustain their cooperation after the initial relief efforts (Moore et al. 2003; Hosseini et al. 2013; Hu et al. 2016; Yuan et al. 2018). For example, the Wenchuan Earthquake NGO Relief Coordination Office ceased operations after only 1 month after its hurried establishment (Yuan et al. 2018), and the NGO alliances were immediately terminated after the first reconstruction phase after the 2003 Bam earthquake in Iran and the 2005 Kashmiri earthquake in Pakistan, (Yuan et al. 2018), which meant that if disaster strikes again, which is certainly possible in these earthquake-prone regions, the scattered NGOs would be ill prepared to provide the urgently needed professional services (Bisri 2013).

However, NGO networks have been found to be extremely effective for collective disaster responses (Hossain and Kuti 2010; Nowell et al. 2017; Comfort and Zhang 2020). NGO joint networks that have effective and sustained coordination and cooperation generally allow the NGOs to have some influence over the disaster relief operations. To build trust with the disaster affected communities, the networks cooperate closely with the local NGOs, which means that more durable disaster relief and recovery services are delivered. However, a brief literature review revealed that most of these networks had been initiated by large-scale foundations or governments that have significant coverage, with less deep modes often failing to maintain the close local resident connections. For example, the Asian Disaster Reduction and Response Network (ADRRN) established in 2002 comprises large-scale national NGOs (Izumi and Shaw 2012), the Gujarat State Disaster Management Authority (GSDMA), which was initiated by the government, was responsible for the coordination of the comprehensive earthquake recovery program after the 2001 Gujarat Earthquake (Vasavada 2013), the East Coast Development Forum (ECDF) in India, which was able to support around 20 percent of the people afflicted by 2004 Indian Ocean tsunami (Kilby 2008), and the hybrid Disaster and Emergency Management Presidency (AFAD) network constructed in Turkey to fight disasters after 1999 Marmara earthquakes (Hermansson 2016; Rocio et al. 2019; Mahmud Akhter Shareef et al. 2019).

As many current NGO disaster relief networks (NDRNs) are generally large-scale and catastrophe focused, little attention is given to small and medium-scale natural hazards (SMNHs) even though these have a higher occurrence frequency than major disasters and a greater need for sustainable NDRNs. Therefore, this study contributes to the literature by

specifically documenting and analyzing the operational NDRNs initiated by the One Foundation (OF), an outstanding Chinese NGO focused on prominent Chinese SMNHs. OF was founded by the international movie star Jet Li in Shenzhen in April 2007, and was the first active private charity in China focused on disaster relief and child welfare. OF has made significant local disaster risk reduction and response achievements because of its unique organizational structure and its wide-ranging collaboration with regional foundations and enterprises (Lu et al. 2020; Lu and Li 2020). As the initiator and sponsor, OF has worked hard to establish a nationwide, independently operated NDRN for SMNHs. The objective of this research is to identify key factors for a sustainable NGO network through the analysis of the OF-led NDRN.

2 Key NGO network sustainability factors

Public management networks in complex domains beyond the scope of any single organization have received recent research attention (O'Toole and Laurence 2015; Crosby and Bryson 2005; Nowell et al. 2017), with many studies having identified key network sustainability factors, highlighted the importance of network structures (O'Toole et al. 2004; Huang and Provan 2007), and stressed the criticality of network management coordination tools and mechanisms (Klijn 1996; Klijn et al. 2010; Cristofoli et al. 2016).

Structural factors, and especially diverse and dynamic structures, have been found to be closely related to network governance (Fulda et al. 2012), democratic decision-making processes, and network connection patterns (Provan and Kenis 2007; Yang and Cheong 2018; Izumi and Shaw 2012). Therefore, effective network construction has received a great deal of research attention. For example, Provan and Kenis (2007) proposed that network governance structures could be divided into those that were participant governed and those that were externally governed. Participant-governed networks are governed by member NGOs, either collectively by the members, or by a lead organization (Provan and Kenis 2007). It involves all member NGOs, who are responsible for their own network operations and are generally focused on building community capacity (Smith and Leonard 2018). However, such decentralized and collective self-governance is not always conducive to effective decision-making (Provan and Kenis 2007). When participant-governed networks are guided by lead organization governance, all key decisions are coordinated through the lead organization; however, while this can be more efficient, the highly centralized asymmetrical power structure can lead to agency problems and higher vulnerability if the hub's capacity is overwhelmed (Hollenbeck et al. 2011; Comfort et al. 2012; Nowell et al. 2017). Externally governed networks are usually governed by administrative network organizations, which are either established by member NGOs or mandated under the guidance of a network formation norm (Provan and Lemaire 2012). Another theoretically interesting structure is the core–periphery network, as it has advantages over fully centralized and fragmented structures in dynamic environments (Nowell et al. 2017).

Different network management strategies, which primarily involve the setting of formal and informal rules for entering into or exiting from the network and rules for behavior within the network, have different performances in different environmental settings (Nowell et al. 2017). These established norms are as important as the fundamental structure as they involve the organization of the interdependent actors and the decision-making processes (Khan 2013); however, many contextual, interorganizational, and inner-organizational factors can exert a significant influence on interorganizational collaboration, network sustainability (Moshtari

and Gonçalves 2016), accountability, effectiveness and aid operations (Moore et al. 2003). Because of the not-for-profit nature of NGOs, network structures need to ensure that member NGOs remain motivated and feel honored for their efforts by their partners (Mayer et al. 1995; Murdie 2013; Keck and Sikkink 2014). Non-material resources, such as trust, solidarity, and open, innovative, exciting, and collaborative atmospheres are vital for successful NGO cooperation (Murdie 2013; Peng and Wu 2018). Bankoff and Hilhorst (2009) found that the ways in which various members relate to one another influences the actions before, during, and after a disaster, and Izumi and Shaw (2012) stressed the importance of raising the network joining threshold to ensure that all NGO collaborators have aligned visions and objectives (Murdie 2013; Peng and Wu 2018).

Network operations mechanisms should also empower NGOs and address community sustainability issues and weaknesses (Izumi and Shaw 2012). Hillig and Connell (2018) found that network sustainability depended heavily on past practice, NGO member expertise, and the ability to mobilize social capital (Hillig and Connell 2018). For example, a case from the NGO Japan Platform (JPF), an international emergency humanitarian aid organization, found that capacity building was vital for efficient joint NGO alliance emergency assistance (Iizuka 2018). Similarly, Peng and Wu (2018) found that substantially improved capacity and professionalism significantly contributed to cross-regional “joint relief operations,” which confirmed that empowering NGOs and enhancing their capabilities was essential for network competence and sustainability (Izumi and Shaw 2012).

Liebler and Ferri (2004) concluded that effective management strategies needed to be sustainable and adaptable to changing environments. Properly constructed networks provide the mechanisms for effective information exchange and external relationship management, such as the securing of long-term donor commitments, and strengthening relationships with local authorities (Izumi and Shaw 2012; Espia and Fernandez 2015). Quizon and Reyes (1989) and Glenda and Banpasirichote (2003) examined the long-standing entangled relationships between authorities and NGOs, finding that on one hand, the state’s culture of governance was opposed to civil society’s culture of resistance and that the strengthening of civil society could result in social disorder and erode government authority (Teets 2009), but that on the other hand, the NGOs’ active involvement in many public management contexts could result in successful cooperative government-NGO relations (Espia and Fernandez 2015), which could aid the state’s influences on the NGO network daily operations, such as the donation channels and the transportation of relief supplies, many of which are all under the control of authorities (Espia and Fernandez 2015). As governments may also monitor and control NGO activities to contain potential threats (Bankoff and Hilhorst 2009; Espia and Fernandez 2015), it is necessary for NGO networks to develop relationships with local authorities.

In summary, drawing on NGO network studies, the following key NGO network sustainability factors were identified: governance structures, operational mechanisms and “soft” factors such as NGO member capabilities, internal coordination, network expansion control, and relationships with outsiders such as donors and local authorities. Figure 1 illustrates the theoretical framework established for this research on NDRNs.

Fig. 1 Theoretical research framework

3 Chinese context

3.1 Disaster background: high-frequency SMNHs

Due to its complicated geological and climatic conditions, China is frequently and severely affected by various types of SMNHs and has experienced an increase in disaster losses in the past few decades (Shi 2016). Even though there were no major natural hazards in 2018, the National Disaster Reduction Center reported that 130 million people had been affected by SMNHs, 635 people had died or were missing, and there had been direct economic losses of 246.4 billion CNY (36.3 billion USD). Therefore, as SMNHs cause significant disruption to daily operations, it is necessary to pay closer attention to possible mitigation effort.

SMNHs are characterized by several factors. First, SMNHs are often less destructive. As the SMNH affected areas tend to be relatively limited, there are fewer casualties and smaller losses; however, despite being less destructive in scale, the victims in the stricken areas still suffer distress and need urgent help. Second, SMNHs are of higher intensity and are more predictable. While most catastrophic hazards such as earthquakes often strike unexpectedly, as SMNHs are mostly meteorological disasters, they have spatiotemporal distribution regularities. The Chinese natural hazards statistics (1949–2010) reported in the National Disaster Reduction Center data (2015–2019) and in Shi (2016) and Zhang and Zhang (2019) summarized China's spatiotemporal SMNH distribution regularities (Fig. 2). Third, SMNHs generally receive less relief assistance. While sudden disasters that result in the deaths of 10,000 people immediately generate significant media attention, charitable donations, and NGO involvement, the 10,000 everyday SMNHs that result in the death of only one person are often disregarded, which means that the survivors often receive poor to no effective assistance from local NGOs as there is less public financial and material support.

Therefore, even though SMNHs are less destructive, because of their significantly higher frequency, greater and more prolonged attention is necessary. While many local NGOs want to be involved in disaster relief, as they lack the resources and expertise, their operations are often unsustainable, and find it difficult to cope when there are frequent SMNHs. Therefore, an NGO network that provides relief resources and professional training could ensure that the necessary assistance is delivered to SMNH victims.

Fig. 2 Spatiotemporal distribution of the SMNHs with OF-led NDRNs in China

After many years of statistical analysis, case studies, and field research, in 2011, OF initiated an NDRN program as an incubation platform for geographically dispersed NGOs that lacked the funding and conduct disaster relief training for their local communities. By the end of 2019, OF had established its presence in 19 provinces and had developed 20 provincial networks that incorporated nearly 1,000 local NGOs (Fig. 2).

3.2 Institutional background: the emerging civil society since the 2008 Wenchuan earthquake

As the Chinese government plays an important role in NGO disaster relief, a brief review was conducted on state-civil society relations in China. To some extent, the state has repressed civil society, with many NGOs threatened by closure due to their unregistered legal status (Sun 2017). The 2008 Wenchuan earthquake was the turning point in the change in local authority attitudes (Teets 2009; Roney 2011; Shieh and Deng 2011); for example, the day after the earthquake, the Ministry of Civil Affairs issued an “Earthquake Disaster Relief” proposal to all NGOs (Yuan et al. 2018), and since that time, an institutional space was opened for actors such as civic NGOs whose public service importance was recognized (Lu and Li 2020). The authorities’ support and even encouragement for the creation of these types of NGOs (Yuan et al. 2018) allowed for the outsourcing of many social services, the increased interactions from which made Chinese NGOs stronger mediators between the state and society (Hasmath and Hsu 2015). As governments loosened restrictions, state-civil society relations evolved, with high trust being built between local governments and NGOs, and with many organizations forming collaborative alliances during relief operations (Lu and Xu 2015). When serving these marginalized communities, many grassroots NGOs also established cooperative relationships with local authorities (Liu et al. 2018). Therefore, although NGOs still rely on governments for resources and legitimacy in a “big government and small society” context, China’s state-civil society relations have thawed significantly, with the government encouraging NGOs to actively participate in public issues such as disaster relief. This relatively loose institutional environment, therefore, created the space for OF to develop 20 provincial NDRNs across China.

4 Methodology

4.1 Case study

As Sichuan has been the most disaster-prone province in China in recent years, OF designated two coordination networks in Sichuan Province: the North-Sichuan network (NSN) that covers 19 of the 21 cities in Sichuan province, and the South-Sichuan network that covers the two remaining cities. Of the 20 OF provincial networks, the NSN was chosen for closer analysis as it was the first network established and was also the most contributive. In June 2013, 2 months after the destructive Lushan earthquake in Ya'an prefecture, Sichuan Province, the NSN, which was originally made up of eight member NGOs, was officially established by OF. After slow development in the first 2 years, the NSN grew rapidly in 2016 from 17 to 34 member NGOs, to 54 members in 2018, and in 2019 after absorbing all 211 NGOs from the Ya'an Mass Organization Service Center (MOSC) established by the Ya'an municipal government, had more than 260 member NGOs, 211 of which had been organized and supported by the Ya'an MOSC to assist in the post-Lushan earthquake reconstruction programs. However, after the completion of these programs, as the government no longer provided support to the NGOs, most attempted to maintain operations by becoming NSN members.

In 2018, the 20 OF provincial networks carried out 56 relief operations, 14 of which were conducted by NSN. Therefore, to explore the structure, operations, and challenges currently being faced by the OF-led NDRNs, this paper chose to closely investigate the NSN. As OF serves as a network development incubator, even though each provincial network operates independently, the operations are similar to the other 19 provincial networks, thereby giving veracity to this case study. The analysis of the overall OF network operations is the subject of future research.

4.2 Data collection

Publicly available media, OF annual reports and WeChat news¹ were collected for the analysis. Further, as the OF program office is in Chengdu, which is near the research university, the authors have been able to establish long-term cooperation; therefore, from July 2018 to July 2019, more than 10 in-depth interviews were conducted with the OF program director and two interviews were held with the NSN coordinator, who were both involved in building the NDRN network, with the foci being on the original intentions, the development history, and the overall OF-led NDRN framework, with follow-up discussions held using WeChat. Another five NSN member NGOs were also interviewed to gain an understanding of the operations and challenges in China's NDRN, the attitudes towards the NSN, the general structure, and the personalized requirements.

Based on the archival data collection and interviews, in August 2019, a four-section survey was sent to all NSN member NGOs to gain information on: the basic organization; the daily operations; the perceptions towards NSN; and the NGOs involvement in relief

¹ WeChat Official Accounts are utilized by member NGOs as a publication tool and a platform to share daily operations and explore partnerships. As it is under the surveillance of the government and has a sound regulatory mechanism, the messages from WeChat can be relied on. Also, the authors cross-checked all the information presented in this paper.

Fig. 3 NSN Structure. *MS* the Meishan municipal network, with the coordination center being at the Qingshen Youth Development Promotion Association; *NC* the Nanchong municipal network, with the coordination center being at the Gaoping Volunteers; *DZ* the Dazhou municipal network, with the coordination center being at the Dazhou Zhongai Service Center; *ZY* Ziyang municipal network, with the coordination center being at the Ziyang Charity Federation; *YA* the Ya'an municipal network, with the coordination center being at the Ya'an MOSC; *ZG* the Zigong municipal network, with the coordination center being at the Zigong Lingxi Public Welfare; and *LS* the Leshan municipal network, with the coordination center being at the Leshan Shancheng Volunteer

operations. The purpose of the survey was to collect general information about the day-to-day relief operations of the member NGOs and to review the members perceptions regarding: (1) the value of the NSN; and (2) the expectations of and demands from the NSN. The survey was distributed to all 54 early-joined NGOs through a WeChat group with the support of the NSN coordinator, and 45 were returned. The 211 newly-joined NGOs from the Ya'an MOSC were excluded on the advice of the NSN coordinator because of their special status and their insufficient perceptions of and incomplete incorporation into the NSN at that time.

5 NSN case study

This NSN case was explored from three perspectives: the basic structure, which reflected the static network mode; the operating mechanism, to learn about the resource mobilization; and the key challenges and the underlying reasons.

5.1 Basic NSN structure

OF's "province-city-community" framework incorporated the scattered NGOs into a joint network, which enabled more collaborative, effective operations. To motivate the synergistic effect between the local NGOs, OF established provincial coordination centers through member NGO elections to empower the provincial networks. The NSN has consequently incorporated many member NGOs in daily relief operations, the spatiotemporal

distribution of which are related to the disaster frequencies in the local communities. Figure 3 shows the three-level NSN structure, with the top-level provincial coordination center in Mianyang and the seven municipal networks and 54 affiliated NGOs distributed across the disaster-prone areas. Normally, the seven municipal centers and their affiliated NGOs operate independently; however, when there is an emergency, they cooperatively carry out the needed relief under the guidance of the provincial coordination center.

5.1.1 Provincial coordination center

The NSN coordination center is based in the Sichuan Origin Charity Center (SOCC), which was involved in establishing the NSN with OF in 2013 when it was also selected as the coordination center. The SOCC is a civil, non-enterprise institution (a mainstream type of registered NGO in China) that develops disaster relief, disaster reduction education programs, and child care programs. Since its establishment in 2008, the SOCC has participated in disaster relief operations for several earthquakes and floods in western China, and as a coordination center was responsible for the reconstruction of 285 earthquake-proof houses after the Lushan and Ludian earthquakes and for the financial management of 68 childcare centers. Over time, the SOCC has developed a great deal of NGO coordination and organization experience in response to the SMNHs and post-disaster construction. The SOCC has around 20 employees, a project department, and a general department. The project department is responsible for disaster relief, public support, and child care, and the general department is responsible for publicity, personnel, administrative affairs and accounting. The SOCC coordinates the NSN and municipal network cooperation for emergency relief operations and, when necessary, deploys human and material resources to other municipal networks.

5.1.2 Municipal networks

Because of the growth in the NGO membership, in 2017, the NSN subdivided the municipal networks to facilitate better communication and resource management, and by 2019, there were seven municipal networks. As the municipal centers operated in the same region, they acted as bridges between the provincial coordination center and the local NGOs and interacted more frequently with the local NGOs than the SOCC. Therefore, these centers are now in a better position to mobilize and coordinate local resources and act as channels through which resources can be allocated quickly and effectively.

5.1.3 Local NGOs

At the base of the “province-city-community” hierarchical structure are the local NGOs, whose role it is to provide direct assistance to the scattered communities. The OF-led NDRN is an open platform that advocates diversification; therefore, to qualify for membership, the NGOs must be willing to participate and cooperate with each other. Most NSN member NGOs are small-scale, with 67% having no more than 10 employees, and are not specialized in disaster relief. Therefore, most are focused on child education, community services, or social work (Fig. 4), which means that with network support, they need to work together.

Fig. 4 Service sphere and staff scale of the local NGOs

Fig. 5 NSN Operations mechanism

5.2 NSN operating mechanism

Figure 5 shows the NSN operating mechanism. As the first responders, the local NGOs are required to quickly collect data about any rapidly unfolding disaster situation and are also responsible for conducting the preliminary need assessments. This information is then sent to the municipal coordination center, which briefly reviews the data to ensure authenticity and then contacts the SOCC to report the disaster details. The SOCC information officer then assembles and sends the information to OF, which makes decisions about the scale of the relief supplies needed. By actively reaching out to publicly spirited enterprises, OF has developed “Business Alliances” to ensure that the necessary relief supplies are provided to the local NGOs. With the support of 11 companies,² this cooperative “OF business community” idea was initiated on April 20th 2014 in Ya’an, Sichuan province to ensure the planning and management of supplies. When information is received by the SOCC, the OF

² These companies were Coca-Cola, Wal-Mart, Procter & Gamble, China Eastern, Lucky Air, China Merchants Logistics, Cosco, China Vanke, Sunrise East, Tencent and Alibaba.

contacts its business alliances, who then coordinate and organize the delivery of the relief supplies.

Table 1 shows the relief operations conducted by NSN in 2018, from which it can be seen that summer was the worst period with 11 of the 14 operations being conducted from June to July for flood emergencies. Led by the SOCC, some of the local NGOs were actively involved in the relief operations. Figure 6 gives a detailed timeline for the relief operations during the Mianyang flood. As can be seen, it took only eight hours for the NGOs to dispatch the first supplies to the victims as clear work assignments ensured smooth relief operations, with the SOCC contacting OF for the relief supply deliveries, and the local NGOs dispatching the supplies to the on-site affected families. Effective communication was the key to these efficient operations.

When there are no relief operations, the NGOs return to their daily child education and community service operations. As most member NGOs have actively reached out to the government for cooperation, most now have reciprocal relationships, with local authorities often offering offices and government service purchases, which often makes up a major part of their revenue. Apart from that, through the SOCC, many local NGOs have fully equipped childcare centers that are open all day to provide safe, friendly activity spaces for children, and especially for those residing in rural and suburban areas. An interviewed local NGO member proudly said;

“We attach great importance to childcare; for example, the idea behind ‘Warm Package’ is carefully thought through: this package especially targets children, and is intended to warm their hearts with love. Henceforth from the perspective of the parents, the services provided by our members are of great value, as they attach great importance to their child. Therefore, local residents gradually recognize our importance.”

Local NGOs also provide safety and health care education through systematically designed courses and participatory activities. The survey results indicated that nearly half the NGOs organized activities more than once a week, which indicated that they had established themselves in the local communities, and more than half the program investments were between 10,000 to 100,000 CNY, which implied that the NGOs normally received funding through their network and from other sources (Fig. 7).

5.3 Key NSN challenges

The survey and interviews revealed three main NSN challenges that were also possibly being experienced by the other provincial networks. The first was associated with insufficient normalization. A key OF requirement is that all provincial networks formulate decision-making, procedural rules, and network operation regulations. In the first few years at NSN, the initial key members abided by these regulations; however, with the addition of new members and the extension of the network, they were gradually ignored. For example, the registrations for the newly-absorbed 211 NGOs from the Ya'an MOSC had not yet been completed by the time of the survey in August 2019, it was revealed that some of the older members had failed to extend a warm welcome to the newcomers, and the NSN coordinator was referring to the newly-joined NGOs as partners rather than members. Fundamentally, the OF-led NDRN and most of the provincial networks are informal civic groups not registered with civil departments, which has made some of the member NGO less confident about the future of the network.

The second challenge is associated with the limited degree of involvement in the NSN. The NSN coordinator admitted that the communication between the network members was

Table 1 NSN relief operations in 2018

Disaster	Date	Type	Scale	Affected region	Contingent accommodation	Causality	Demolished house	Participating organizations
Dazhou Flood	May 21th	Flood	Small	Dazhou				SOCC; DZSC
Leshan Shawan district Flood	May 21th	Flood	Small	Leshan Shawan district	812	2 dead; 4 missing	81 collapsed	SOCC; LSV
Jiuzhaigou Flood	June 6th	Flood	Small	Jiuzhaigou	788		11 damaged	SOCC; JV
Leshan Jiajiang Flood	June 26th	Flood	Small	Jiajiang district; Leshan	1425		1 collapsed; 1 damaged	SOCC; LSV
Leshan Wutongqiao district Flood	July 2nd	Flood	Small	Wutongqiao district; Leshan			certain amount of houses damaged	SOCC; LSV
Suining Flood	July 11st	Flood	Medium	Shelong district; Suining	Over 1 million were affected by the floods	3 dead	Around 600 collapsed, near 8800 damaged	SOCC; SYV
Ziyang Flood	July 11st	Flood		Ziyang				SOCC; ZCF
Jiangyou Flood	July 13th	Flood		Jiangyou				SOCC; JRYV
Zigong Flood	July 13th	Flood		Zigong				SOCC; ZCC; FCA; ZLPW; DYV; YVY
Pengan Flood	July 11st	Flood		Pengan town; Nanchong				SOCC; PV
Pingwu Flood	July 11st	Flood		Pingwu town; Mianyang				SOCC; MHCC
Deyang Flood	July 11st	Flood		Deyang				SOCC; DRC
Mianyang Flood	July 11st	Flood		Anzhou district and Beichuan town; Mianyang				SOCC; NFCC; NQSC; NQV
Yibin Earthquake	December 16th	Earthquake	Medium	Xingwen Town; Yibin	386	17 slightly injured	231 damaged; 15 collapsed	SOCC; QCV; YAV

DZSC Dazhou Zhongai Service Center; LSV Leshan Shancheng Volunteer; JV Jiuzhaigou Volunteer; SYV Suining Youth Volunteer; ZCF Ziyang Charity Federation; JRYV Jiangyou Runwu Youth Volunteer; ZCC Zigong 997 Charity Center; FCA Fushun Community Alliance; ZLPW Zigong Lingxi Public Welfare; DYV Daan Youth Volunteer; YVY Yantan Youth Volunteer; PV Pengan Volunteer; MHCC Mianyang Heart Charity Center; DRC Deyang Red Cross; NFCC North-Sichuan Fish Charity Center; NQSC North-Sichuan Qiang Service Center; NQV North-Sichuan Qiang Volunteer; QCV Qi County Volunteer; YAV Yun Ai Volunteer

Fig. 6 Detailed timeline for the relief operations during the Mianyang flood from July 11 to 14

Fig. 7 Activity frequency and program investment

far from satisfactory: “In the current mode, local NGOs still lack initiative: in most cases, it is the disaster relief project team temporarily formed by SOCC and a few core member NGOs that take responsibility for the allocation of human resources.”

Also, not all members were involved in the decision making, with the core members tending to deal with the important network affairs, most of which tended to be focused on fundraising and specific programs and projects rather than development or network governance. The survey results found that 14% of member NGOs had never participated in joint relief operations, 43% had only been involved 1–2 times per year, and 49% had never cooperated with any other member NGOs since joining the network (Fig. 8). As can be seen in Table 1, while the SOCC has participated in all relief operations, and the municipal centers have also been actively involved, few other NGOs have participated, which indicates that the activities and connectivities within the NSN are not very high.

The third challenge was related to the significant dependence on OF, which mostly plays a parental role in the network development. Generally, OF mobilizes the relief resources

Fig. 8 Frequency of joint relief operations per year and cooperation with other member NGOs

and provides the capability-building funds. As the survival abilities of many local NGOs has been relatively low, the 211 Ya'an NGOs chose to join the NSN; however, most member NGOs have little funding, with 68% of the surveyed NGOs claiming to be on very tight budgets. The key contradiction, therefore, was that the limited resources provided by OF have been unable to deal with the increase in member NGOs around the country.

The lack of local abilities to gain access to resources has significantly restricted many of the NGOs' operations, with most local NGOs barely able to sustain their daily operations and having very few additional disaster relief resources. Compared to relief operations funding, disaster mitigation and preparedness projects, which include training activities such as drills to enhance community resilience, are finding it difficult to get funding. The SOCC, for example, had run disaster reduction education summer camps for children for three consecutive years; however, because of funding shortages in 2019, the project was discontinued. This inadequate access to financial resources has made it more difficult to retain full-time staff, which has led to high turnover rates and an inability to implement advanced information technologies for capacity-building.

6 Key characteristics of a sustainable NDRN for SMNHs

Frequent SMNHs are the main operations area for NGOs focused on emergency assistance, which also provide the needed training to ensure the NGOs are better prepared in the event of a large-scale disaster relief operation. From the examination of the NSN and the OF-led NDRN model, the factors necessary to ensure sustainable NDRNs for SMNHs were identified, which can also provide a valuable reference for other countries.

6.1 Organizational structure: a combination of networked and hierarchal characteristics

Networked structures allow for greater coverage through the integration of more local NGOs from scattered communities, and hierarchical structures facilitate better network governance and improved operational efficiency (Izumi and Shaw 2012; Nowell et al. 2017). Therefore, the "province-city-community" structure developed by OF has been effective in managing and expanding the joint NGO network. Local NGOs have developed

entrenched, trusting relationships with the communities through their social interactions and community education and training programs (Fredricks et al. 2017), which has also empowered them to better respond to the SMNHs (Stroup and Murdie 2012; Peng and Wu 2018). The core-periphery structure that governs the standard operating procedures and the internal vetting rules has facilitated a lateral emergent coordination platform for reliable information exchange, which ensures that there are always timely responses to disasters (Izumi and Shaw 2012; Nolte et al. 2012). Specifically, the “province-city-community” structure has the following functions:

The “province-city-community” structure facilitates disaster response efficiency. When a disaster strikes, it is vital to minimize the response time; however, when relief organizations have no access to critical, timely information about the real situation on the ground, it is difficult to make proper decisions (Nelson et al. 2011; Izumi and Shaw 2012). Under the “province-city-community” structure, the early response phases, such as the needs assessments and resource mobilization, are significantly smoother because the close links between the relief network and the local stakeholders (e.g., community-based organizations) accelerate the relief efforts (Izumi and Shaw 2012; Tang et al. 2015; Hillig and Connell 2018). Theoretically, the OF-led NDRNs have the ability to deliver relief supplies to any remote stricken areas within 12 h as every disaster-prone province has a joint network that involves many distributed local NGOs, which means they can efficiently respond to any unexpected disasters around them.

The “province-city-community” structure provides kindred care in the absence of disaster. Disaster reduction goes beyond relief operations. The NSN fully utilizes the local NGOs to determine the community’s needs and concerns and provide emotional support and resource sharing, which in turn means that local residents are more open to the NGOs’ services and suggestions. The SOCC, which was started in 2008 in Beichuan county, one of the worst-hit counties in the Wenchuan earthquake, exemplifies this differentiated mitigation approach. Because many children were traumatized by the earthquake, the SOCC built more than 20 childcare centers with the OF funds, with the partner NGOs being given the responsibility for the centers’ daily operations. These centers now serve as bridges between the residents and the NGOs and help strengthen mutual trust.

The “province-city-community” structure contributes to community resilience building for disaster preparedness because the local NGOs are based in the communities. As these communities tend to experience smaller but more common disasters, the local NGO presence can assist in preventing future losses by improving community resilience (Walters and Gaillard 2014; Dennig et al. 2015). As residents are often the first to respond and the last to leave when faced with disaster (Vallance and Carlton 2015), they need to be better prepared. With a shared vision and personal connections, local NGOs contribute to the community disaster management by improving community resilience through counter-disaster skill training and/or drills and establishing community rescue teams (Sharma et al. 2003; Islam and Walkerden 2015; Peng and Wu 2018).

6.2 Operational mechanism: external and internal coordination

The NSN analysis revealed that the lack of resources remains the most significant challenge for the NDRNs, which means that to guarantee longevity, external coordination and secure long-term, flexible donor commitments from outside bodies such as the government and private enterprises are needed (Izumi and Shaw 2012). Therefore, rather than relying on OF as the primary or even the only funding source, provincial networks need to develop

their own fund-raising platforms and open new channels by, for example, establishing strategic partnerships with targeted enterprises that provide relief supplies and seeking potential contributions from individuals. Apart from securing sufficient funds, to enhance mutual understanding, it is also important to maintain effective communication with donors by keeping them fully informed of how the donations are being used. Some OF provincial networks cooperating with local government emergency agencies have been allowed to use government warehouses to store their disaster supply reserves.

As large-scale disasters may randomly hit any province at any time and because relief capacities vary across the provincial networks, good inter-provincial network coordination is essential. For example, during the freezing disaster relief operations in Hunan and Guangxi provinces in 2011, the OF-led Guizhou provincial network promoted cross-provincial network cooperation, in 2012, the OF North-Sichuan and Guizhou networks assisted the Yunnan network in their drought relief operations, and later the Guizhou and Guangxi partners went to Yunnan to assist in the flood relief operations, and the Shanxi network mobilized resources to aid Hubei. In the 2013 Lushan earthquake, partners from 10 provincial networks across the country assembled in Ya'an to establish a temporary coordination center, two warehouses and three county-level workstations to jointly and efficiently conduct the relief operations. Bonded by a common mission and purpose, the independently-operating NGOs from the different provincial networks were able to cooperatively conduct effective relief operations in coordination with the local provincial network coordinator.

Internal coordination is equally important, with the mutually beneficial partnership of the members being essential to ensuring a robust structure, sustainable development, and effective joint network relief operations (Izumi and Shaw 2012; Nowell et al. 2017). While municipal-level coordination is seen as critical to the “province-city-community” structure, in the NSN, the provincial coordinator said that they sought to maintain contact with most member NGOs. In every relief operation, the SOCC always rushes to the front, which increases their partners’ trust in the SOCC, but decreases the role of the municipal coordinators. Therefore, capability building at the municipal coordination centers needs to be enhanced, and to reduce the avoidable conflicts arising from resource allocation between member NGOs, participatory decision-making needs to be promoted to ensure that critical information is clearly communicated.

6.2.1 Capacity building: periodic training programs for future independence operation

All network member NGOs need disaster relief and resource acquisition capacities. Under OF guidance and funding, the provincial coordination centers initiate capacity-building programs for their member NGOs to improve their collaborative relief operation capabilities and enhance their abilities to acquire resources and manage their finances. Because of the common local NGO problems associated with high employee turnover and the lack of professional knowledge and project funding, capacity-building programs need to be regularly conducted. Hands-on and advanced relief operations knowledge need to be effectively communicated to all member NGOs. As most partners lacked basic public welfare, project implementation and financial knowledge capabilities, in the initial NSN network development stage (2013–2015), the programs were mainly theoretical. However, the SOCC information officer has now introduced effective methods to collect disaster-related data, analyze supply needs, and formulate action plans and budgets. In 2017, the training program

focus shifted to exercises and drilling to enhance the NGOs' relief skills as the coordination center found that only 3 to 4 NGOs in the network had the necessary expertise to conduct professional relief operations. As drills enhance NGO familiarity with the contingency plans, these types of repetitive operations can assist members remain fully informed of their responsibilities and reporting lines, which further optimizes the collaborative capabilities of the NGOs (Twigg and Steiner 2010).

Enhanced NGO capacity assists in network governance and sustainability and ensures that all NGOs have a common vision. OF's goal is for all provincial networks to attain sustainable operations so it can gradually withdraw its need to provide full support. The OF program director revealed that the ongoing training had allowed some provincial networks to register as NGO federations with the provincial civil departments, which allowed them to receive funds to ensure better cooperation with government agencies in disaster relief and preparation programs.

6.2.2 Network expansion: raising the entry threshold

If there is no entry threshold, the NGO network could grow too large to be effective, as evidenced by the NSN's inclusion of the 211 member NGOs from Ya'an. At present, if NGOs wish to join the NSN, they only need to submit an application form, and as long as they are able to participate in disaster assessment, search and relief operations and to supply transport, they are deemed to be suitably qualified. However, the survey results revealed that many NGOs in the NSN were not specialized in disaster relief and some had never participated in relief operations, with many saying that they had joined the network for the potential resources provided by OF. Therefore, these NGOs could not only further dissipate the already limited funding but could also cause network instability as some highly experienced disaster relief member organizations could fail to get the necessary funding to continue their disaster reduction and preparedness programs, which could also give rise to internal conflicts.

Though the "province-city-community" structure requires a large number of member NGOs, the importance of an organization's suitability should outweigh the need for extensive coverage. Therefore, to encourage the initial multi-aid group goal of an NGO aggregation that shares common long-term goals (Peng and Wu 2018), the network entry threshold needs to be raised, that is, before entering the network potential member NGOs would need to already be an independent organization that has the ability to acquire its own resources (Murdie 2013) and has staff that are qualified, experienced and interested in disaster relief.

6.2.3 Government-NGO relations: reciprocal and cooperative

NGOs in China have been found to be more constrained than in other countries (Alagappa 2004; Sun 2017). Therefore, to better serve the residents, local NGOs need to deal carefully with local authorities (Qiaoan 2020). Because OF operates as a platform for nurturing 20 provincial NDRNs, it inevitably has frequent interactions with government on all levels, which has assisted in its development of these networks. In particular, OF has established a functional party branch so that all activities are conducted under the leadership of the Chinese Communist Party. OF has also actively built cooperative relationships with government agencies such as the Shenzhen Municipality Civil Affairs Bureau of the Shenzhen Government, and in 2016 became involved in two research projects from the Ministry of Civil Affairs of China focused on the involvement of NGOs in disaster relief. The success

of provincial network relief operations also relies on good relationships with local authorities. However, as current policies require that every large-scale operation be first reported to the government, this reduces the threats to the NGO disaster relief network.

The professional OF-led NDRN agenda also makes its disaster rescue operations complementary to those of the government, that is, the OF-led NDRN assists government operations by providing complementary works such as supply distribution and self-rescue training. Such skills and expertise are greatly needed in disaster relief operations, which demand not only professional rescue teams. As it represents the whole society, afflicted residents feel cared for. Disasters tend to most severely affect vulnerable groups such as children, women, the elderly, and the disabled, the networked local NGOs need to identify complementary areas and select NGOs with the expertise to provide differentiated public services to ensure that both the urgent and diverse needs of these vulnerable groups are addressed. When there are no relief operations, grassroots NGOs can return to their daily operations, which makes them better positioned to serve the residents. The established complementary government-NGO relations have a significant effect on disaster governance (Lu and Li 2020), and NDRN sustainability.

7 Conclusion

This paper explored the structure, operations, and challenges of a Chinese NDRN. Because of the large number of SMNHs in China every year, OF developed an NGO joint network and established 20 provincial networks for disaster relief, of which the NSN was the first and one of the most contributive. The NSN case in this paper revealed that several conditions were necessary to ensure a sustainable NDRN. First, the joint network organizational structure should have both networked and hierarchal characteristics, such as the “province-city-community” structure developed by OF. As effective network operations require both excellent internal and external coordination, the entry threshold needs to be raised to ensure healthy network expansion, and periodic training programs are needed for all member NGOs to build network capacity. Finally, to maintain good relations with the state agencies, joint networks must have clear self-positioning as civic groups that complement and supplement the government’s disaster relief efforts.

Although this NGO joint relief network was developed in a Chinese context, it has global significance. One of the most prominent characteristics of the network has been its active response to the SMNHs. As large-scale disasters are rare, dealing with SMNHs has been the NGO focus, with the NGO network being vital for integrating NGOs that have various disaster relief expertise. Though many NGOs specialize in different areas, overall network capacity can be enhanced by expanding their comparative advantages through collective decision making and resource sharing. Maintaining the current networked and hierarchal organizational structure can also ensure that the local NGOs have the abilities to flexibly and efficiently respond to the SMNHs.

Localization and sustainability are the greatest network values, with most member NGOs being active in their communities by providing regular child care, poverty alleviation, and community services, which also enhances network vitality. In less disaster-prone seasons, the network conducts training programs to improve local disaster management capacities, which further strengthens the NGOs’ bonds with the communities and strengthens network sustainability. However, in general, network sustainability relies on the development and maintenance of disaster relief and resource acquisition capacities.

As sustainable capacity building leads to a sustainable NGO joint network, professional and coordinated disaster relief operational knowledge is crucial for network members that come from various fields and have differing expertise and mixed capabilities. Funding, however, remains a key challenge as many local NGOs struggle to raise the funding needed for their programs.

As the first and currently the only NDRN with nationwide coverage in China, the OF-led NDRN is far from perfect. However, it has been always active in disaster relief, for example, during the Covid-19 pandemic when the whole province was under lockdown, the Hubei network effectively organized local NGOs to provide emergency medical and livelihood supplies to the community hospitals and the populations in quarantine when the whole province was under lockdown. Further research could analyze the overall structure and challenges of the OF-led nationwide NDRN and assess its operational effectiveness, the findings from which could assist in developments in other disaster-prone countries.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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