

Multistakeholder Participation, Collaboration, and Networking in Disaster Risk Reduction and Pandemic Management: Insights and Future Policy Framework

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The natural and manmade disasters impact a society with loss of assets and human lives. Disasters leave people in vulnerable conditions and an overall economic slowdown is observed. The impact of disasters is highly complex and multidimensional in nature. It becomes imperative to handle the complexity of issues with comprehensive approach. Managing disasters effectively is one of the important challenges any government faces when it tries to be prepared with appropriate mitigation, rescue, and relief strategies. The unexpected nature and urgency related to Disaster Risk Reduction makes it important and relevant to involve multistakeholders. This will help to bring down the severity and impact of the disaster on human lives and losses. Disaster Risk Reduction requires meticulous planning and sharing of the responsibility among multistakeholders through networking so as to bring down the severity and minimize the negative impact of a disaster. Many research studies have suggested the multistakeholder approach in addressing the disasters. There are several gaps such as inefficiency of vertical management to deal the issues, involvement of multiple stakeholders, and lack of local public support for disaster. This paper, considering the case

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of COVID-19 as a pandemic and disaster, discusses the importance of multistakeholder participation. The paper presents an extensive review of the papers on the relevance of participation of multistakeholders in Disaster Risk Reduction and explores the scope and challenges involved and suggests policies to address the disasters, which utilizes Multistakeholder Participation.

Keywords: *global health diplomacy, governance, collaboration and networking, disaster risk reduction, multistakeholder participation, transdisciplinary approach*

Introduction

Disasters cause not only economic crisis but also humanitarian loss, mental and psychological trauma, and slow down of a society's development process. Disasters are to be handled with priority and to be addressed comprehensively with innovative and pragmatic multistakeholder participation approach. In multistakeholder participation, to address disasters most effectively, sharing of information, coordination, and quick decision are most important (Hayne & Smith, 2005). The terms "Multistakeholder platform" and "multistakeholder's participation" are used to represent the process where different actors with a common pool of resources and common interests come together, discuss the possibilities, and develop proactive and pragmatic solutions for the good of the public (Warner, Waalewijn, & Hilhorst, 2002). The past experiences in disaster risk reduction show that even after efforts, the affected society takes a long time to cope with the aftermath of disasters because multistakeholder participation is not channelized properly in mitigation and rehabilitation efforts (Fletcher et al., 2013). The COVID-19 pandemic serves as a prime example of global health crisis and the importance of networking, collaboration, and multistakeholder participation in handling disasters. The complexity of handling pandemics and disasters has increased recently, necessitating a more coordinated, inclusive strategy that makes use of a variety of resources and areas of expertise.

After a disaster occurs, a number of key stakeholders are involved in providing relief and rehabilitation support. One of the major challenges in the field of Disaster Risk Reduction is to understand how to develop a response with appropriate coordination between various stakeholders and ensure flexibility and lucidity in the system at the same time (Nowell, Steelman, Velez, & Yang, 2018). During the last two decades, disasters are all transboundary in nature and uncertain, and collective stress is very high which demands rapid responses from multiple agencies or stakeholders (Ansell, Boin, & Keller, 2010). Disasters bring constraints such as hierarchical organizations tend to break down, personnels are hindered by lack of information, lack of flexibility in the administrative procedures, constraints for innovation, and inability to shift resources and actions to meet the new demands quickly, which lead to cumulative stress in the Disaster Risk Reduction (McDonald & Sinha, 2008). Multistakeholders are required to respond, network, and share the information to have strategic, tactical, and operational plans to

handle the disasters. Optimal use of available time is one of the crucial aspects in the disaster risk reduction; timely information is required, and it depicts the need for collaboration with involvement of multistakeholders at wider level. A better multistakeholder management can improve the effectiveness and efficiency of Disaster Risk Reduction in humanitarian operations.

The stakeholders involved in disaster management include military and paramilitary forces, contributors, and government and nongovernment organizations, who have to cooperate and collaborate with people from different cultures and ethnic groups (Cozzolino, 2012). Availability of scientific knowledge and appropriate information is mandatory for decision-making, clear assessment, and formulation of appropriate measures (Zhou et al., 2020). Making policy decisions by providing inputs and delegating responsibilities among themselves to develop proactive prevention strategies with the involvement of community are imperative (Biekart & Fowler, 2018). During a disaster, no individual, agency, or government machinery have the legitimacy, authority, or professional competency to handle the situation exclusively; it demands collective action, interaction, and networking (Nolte & Boenigk, 2013). Effective response to a disaster is about networking and enterprising (Moynihan, 2008). Multistakeholder participation has always helped to improve societal ownership and response of the Disaster Risk Reduction or rehabilitation measures. Multistakeholder initiatives are helpful in bringing in collective actions for public benefits; and as they rely on one common factor, they are more productive, efficient, and effective (Beisheim & Simon, 2016).

Stakeholders are classified into three groups: primary, secondary, and key stakeholders. Key stakeholders are mainly responsible for policy decision and are involved directly. Primary and secondary stakeholders have interest in the program but are not directly involved (Freeman, Harrison, Wicks, Parmar, & De Colle, 2010). The process aims to bring all the stakeholders together, based on recognition to the concept of equity and accountability. The participation process involving multistakeholders is democratic in nature, following the principles of transparency and participation. This ideally develops partnership and strengthens the networks among them, and thus disaster relief and management become efficient and effective (Hemmati, 2012). Multistakeholder participation improves capacity-building, ensures innovation, and promotes faster decision-making process, which ultimately benefits the community (Achyar, Schmidt-Vogt, & Shivakoti, 2015).

There are studies that show the success and relevance of multistakeholder participation in Disaster Risk Reduction. In the case of Hudhud cyclone in Vishakapattanam, multistakeholder participation under the leadership of the State Government has shown a positive impact in terms of rehabilitation and bringing back the normalcy (Meduri, 2016). The study from Indonesia showed that multistakeholder participation and collaboration, as a crucial and important factor, has helped reduce the disaster risk and helped implement balanced Disaster Risk Reduction policies (Trimurti, Endang, Hardi, & Hartuti, 2020). Hui (Hu, Lei, Hu, Zhang, Kavan, 2018) analyzed the situation in China and pointed out that the failure of government networks and

its inefficiency of disaster relief measures are due to the lack of multistakeholder collaboration and internal dynamics of the system.

Global health Governance during COVID-19 pandemic was crucial; however, what the world witnessed was that the nations adopted uncoordinated, ad hoc responses partially adhering to the WHO guidelines (Jones & Hameiri, 2022). International organizations such as the WHO was tasked with developing and disseminating “best practice” policies, whereas different nations adopted it with a lot of flexibility and their own suitability and adaptability. An overall coordination between nations was largely not observed (Taylor & Habibi 2020). In this paper, we have reviewed the available literature and identified the role of multistakeholder participation, coordination, and networking in handling disasters (with special focus on COVID-19 pandemic) in an effective manner. As the world is expecting more zoonotic diseases, developing effective strategies for Disaster Risk Reduction of infectious pandemics is very crucial.

COVID-19 Pandemic and the Role of Multi-stakeholders

The pandemic has left a deep impact on the global economy wherein the Gross Domestic Production (GDP) of the countries sharply decreased, and this slowing down of the economies has led to various livelihood issues. The COVID-19 pandemic not only has disturbed the social lives and financial status but also has affected the health and wellbeing (Jha & Pankaj, 2021). International community and various stakeholders have taken steps to provide immediate relief, rehabilitation, and reconstruction. The traditional models or approaches of coordination are inadequate for volatile and dynamic situations like that of pandemics, floods, and disasters (Faraj & Xiao, 2006). COVID-19 has showed the contingent, fragile nature of global governance institutions, as well as the limitations of power and authority in the face of large-scale crises (Levy, 2021). Multistakeholder collaboration is an important key to handle issues developed by disasters as it reduces the pressure on the government machinery and enhances the effectiveness of relief and rehabilitation.

Multistakeholder partnership in health emergency response situations tends to be futile when concerns about the ownership of outcomes and differences in organizational working practices amalgamate (Ryu & Johansen, 2017). If the collaborative efforts or partners have transparency about the roles and responsibilities, then the public health emergency can be handled more effectively within a short duration (de Vries et al., 2019). When multistakeholder participation is attempted in addressing earlier pandemics in the Asian region, issues such as resource limitation, unethical priority setting, and less confidence in the adopted surveillance technology inhibited effective pandemic preparedness (Bennett & Carney, 2011). Major issues identified in multistakeholder collaboration in health preparedness include the partners’ lack of commitment, non-supportive collaborative work environment, absence of clarity about mutual expectations, informal interactive style of communication, and limited resource commitment over a longer period of time (Akenroye et al., 2022).

It is important to involve multistakeholders before the occurrence of disaster as a preparatory work. Better preparatory works reduce the impact of severity of the pandemics. The preparatory work requires multilevel coordination, collection of information, and appropriate coordination mechanism among stakeholders in the pandemic situation. Hence, there is a need to develop flexible multistakeholder coordination mechanisms that can be easily customized for a specific situation and provide better support for improvised responses (Janssen, Lee, Bharosa, & Cresswell, 2010). Domestic support alone is not sufficient; a collective action is required to handle the situation which mainly involves international support, international law, and geopolitics. It reiterates the need to have global partnerships with multilateral and bilateral agencies, media, research institutions, civil society organization (CSOs), religious and cultural groups, and nongovernmental organizations (NGOs). It is important to work on for international cohesion, coordination in disaster response, leveraging the technologies for mitigation, and management of multihazard risks and vulnerability. The multistakeholder platform is helpful mainly to create a space for the empowerment and active participation of common stakeholders intending to search for solutions to a common problem.

It is important to facilitate multistakeholder participation, preparatory activities, clinical intervention, and public health (Faysse, 2006). Multistakeholders should be involved in the policy formulation and implementation to address the complex Disaster Risk Reduction issues. The participatory approaches must be adopted in planning, preparing action plans, training personnels, identifying problems and correcting mistakes, and implementation.

Objectives and Methods

The recent case of COVID-19 provides an example at world level to explore the relevance of multistakeholder participation in the preparedness and response for addressing the pandemic. The paper focuses on the following objectives: (1) to highlight the relevance of multistakeholders in Disaster Risk Reduction, including COVID-19 preparedness and response; (2) to document the issues and challenges in collaboration, networking for timely intervention in health Disaster Risk Reduction including COVID-19; and (3) to provide suggestions to enhance multistakeholder participation in most infectious and reemerging diseases outbreak management. In order to better understand the dynamics of multistakeholder participation in disaster risk reduction, this paper specifically looks at the lessons that may be drawn from the COVID-19 pandemic.

Review Methods

This paper conducts an extensive review, employing a broad and inclusive approach to literature analysis. Key terms such as “Disaster Risk Reduction,” “multistakeholders,” “pandemic,” “transdisciplinary research,” “networking,” and “COVID-19” were used to guide the search across databases including Google

Scholar, JSTOR, BMC, Springer, JAMA, Scopus, JPHP, Elsevier, Lancet, PLOS ONE, MDPI Journals, Nature, APA, WHO Documents, Government Policy Documents, and PubMed. The search, from January 2020 to October 2022, aimed to capture a diverse array of sources reflecting the multifaceted nature of multistakeholder participation in disaster risk reduction, with a particular focus on the COVID-19 pandemic. Selected materials included peer-reviewed publications, journal articles, reviews, meta-analyses, disaster mitigation reports, feedback reports, reference books, strategic preparedness, and response plans. Prioritizing English language literature, this review emphasizes empirical studies, reviews, meta-analyses, and policy documents, ensuring a comprehensive understanding of the subject matter.

Multi stakeholder Participation in Disaster Risk Reduction and its Challenges

The international community shares the responsibilities to provide immediate relief, rehabilitation, and reconstruction, providing health services, including water, sanitation, food, shelter, appropriate medical care, and helping in the livelihood sustainability of the affected population. However, issues of the victims especially related to livelihood and health continues to be a big challenge. The victims also require psycho-social help, economic reconstruction, and opportunities for livelihood rebuilding. In a post-disaster scenario, the preparatory work requires multilevel coordination, collection of information, and the appropriate coordination mechanism among the stakeholders (Jillson et al., 2019). Therefore, there is a need to develop flexible and multistakeholder networking mechanisms that can easily be customized for the specific situation and provide better support for improvised responses. It highlights the need to have global partnerships with multilateral and bilateral agencies, media, research institutions, CSOs, religious groups, and NGOs. It is important to work for international cohesion, coordination for the disaster response, leveraging the technically viable and economically feasible technologies for mitigation and management of multihazard risk and vulnerability (Satapathy & Walia, 2007). The multistakeholder platform is mainly helpful in creating a space for the empowerment and active participation of common stakeholders intending to search for solutions to a common problem (Obeng, Marfo, Owusu-Ansah, & Nantwi, 2014). It is important to facilitate the multistakeholder participation in preparatory activities, clinical intervention, and public health. Multistakeholders should be involved in policy formulation and implementation to address the complex disaster risk reduction issues. In this review, we have identified some of the important barriers and challenges which are presented in Table 1.

A Case of COVID-19 Pandemic Management

As per data from the World Health Organization (WHO) as on December 14, 2023, COVID-19 infected cases were 773 million and total reported deaths were

Table 1 Challenges and barriers to successful collaboration among multistakeholders

Barrier/Challenge	Major problems	Studies
Trust deficit	Absence of long-term commitment among partners, and lack of trust and comfort among various stakeholders	(de Vries et al., 2019; Lai, 2012; Shoaf, Kelley, O'Keefe, Arrington, & Prelip, 2014)
Poor governance and decision-making process	Absence of shared decision-making, poor governance with delayed decision-making pattern	(Akenroye et al., 2022; Cruz, 2014)
Concern about ownership and success	Unrealistic expectations about outcomes after collaboration and apprehensions on how to claim ownership of success	(Dunlop, Logue, Vaidyanathan, & Isakov, 2016; McCullough, Eisen-Cohen, & Lott, 2020)
Funding-related issues	Limited resources, fluctuating fund amounts, inadequate funds for long term	(Cruz, 2014; McCullough et al., 2020)
Poor leadership	Inappropriate and confusing chain of command, leadership styles, duplication of duties and responsibilities	(de Vries et al., 2019; Shoaf et al., 2014)
Organizational Autonomy	Lack of organizational autonomy and networking at similar levels	(Shoaf et al., 2014)

Source: The above data is collected by the authors from different sources.

6.98 million. The pandemic which affected the whole world has left deep impact on societies and has led to heavy economic standstill and losses. One of the strategies to combat the pandemic is to minimize social and economic hardship through multisectoral partnerships (WHO Coronavirus [COVID-19] Dashboard, 2023). The Novel Corona Virus Strategic Preparedness and Responsive Plan released on February 03, 2020 emphasized on the aspect wherein the WHO highlighted the need to encourage networking and multistakeholder participation at all levels, sharing the resources, expertise, and skills.

Based on the intensity of the pandemic, the number of players involved in the preparedness and operation vary. This predominantly involve healthcare providers and administrators, experts, logistics organizations, government and NGOs, communities in the villages, and ethnic groups (Cozzolino, 2012). Many countries carried out exercises to identify the gaps and problems involved in adopting an efficient swift response strategy to address the pandemic aftermath. For example, India, in its preparedness to combat COVID-19, conducted the civil servants feedback survey wherein ten major gaps were identified, which were as follows: (1) hospital preparedness and infrastructure; (2) quarantine and isolation facility; (3) testing facilities; (4) personal protection equipment; (5) lack of public awareness; (6) law and order administration (State/District); (7) foreign travel history and contact tracing; (8) temporary and wage-worker exodus; (9) sanitizing public

places; and (10) essential goods and services. (The National preparedness Survey on COVID-19 conducted by the Department of Administrative Reforms and Public Grievances, Government of India [GOI, 2020]). The survey also acknowledged that all the above-mentioned requirements cannot be arranged and coordinated solely by the government system and it called for multistakeholder collaboration, various actors' role in the restoration, rehabilitation, and reconstruction of the pandemic-affected areas.

Pandemic: Response, Recovery, and Mitigation Experiences

A few countries including South Korea and New Zealand have taken timely efforts to address the pandemic management. In other countries such as Italy, Sweden, France, the UK, and the USA, a strict quarantine mechanism was not enforced during the initial period of COVID-19, which resulted in the quick spread of the virus. In India, the Government started intensifying preparedness for the unprecedented threat posed by COVID-19, where it constituted an interministerial committee represented by the ministers of the health and family welfare, civil aviation, external affairs, and home, as well as the National Disaster Management Authority (Dikid et al., 2020). However, no private institutions or organizations were involved in preparedness of the pandemic at this early stage. The only decision in the direction where multistakeholders were engaged was the attempt made to include the village-level communities. The Panchayat-level governments through the Gram Sabhas tried to conduct awareness drives on the clinical presentation of the novel COVID-19 disease, its preventive measures, and the need for reporting the cases especially in the village areas. Much of the technical support was made available by the epidemic intelligence service by the NCDC in collaboration with the US Centers for Disease Control and Prevention (CDC). This was one of the important aspects of leveraging technical resource for addressing the COVID-19, and it actively supported the COVID-19 response. This helped India mobilize external support to update the disease surveillance systems; investigate outbreaks; respond to disasters, emergencies, and mass gatherings; and conduct epidemiological evaluations. This intervention had a great potential in strengthening the epidemiological capacity of health professionals in the country to respond efficiently to public health emergencies such as strengthening core capacity in the areas of disease surveillance, early detection, and rapid response, generating evidence that could be used for policymaking and implementation.

It is suggested to have strong national surveillance to detect COVID-19 cases and other similar future epidemics, respond to active case findings, prompt treatment and isolation of cases, contact tracing, and preventing an outbreak from happening or limiting its spread to the public by taking containment measures. The Corporate Social Responsibility components of profitable companies can play a major role as they have already developed rapport and confidence in village communities (Patuelli, Caldarelli, Lattanzi, & Saracco, 2021). The involvement of multistakeholders such as private organizations, technocrats, international agencies,

and community members to address the COVID-19 pandemic will ensure more efficiency and effectiveness (Jiang, 2020).

Cooperation and understanding between the Federal (Central) and State governments are also important (Ghosh, Nundy, & Mallick, 2020). It is important that the National Pandemic Preparedness Plan (NPPP) and State Pandemic Preparedness Plan (SPPP) should be coordinated, collaborated, and integrated at an appropriate level to ensure efficiency. A rich technical expertise available with a large number of research and academic institutions must be identified and utilized (Babbar & Gupta, 2022). The pharmaceutical industry should be engaged for the promotion of Research and Development in the production of local technology-driven solutions including door-step diagnostics, drugs and vaccines, and as well as the innovative use of information and communication technologies for data collection and analyses (Ayati, Malik, Raees, & Anwar, 2020). COVID-19 has brought untold misery to a large section of low-income strata and to ensure the sustainability of the livelihood and restore normalcy in post-COVID-19 era, collaboration between local self-governments, civil societies, and NGOs is crucial to ensure maximum community participation (Raychaudhuri, 2020).

The involvement of private research organizations, efficient utilization of medical infrastructure, and availability of technical support from both national and global experts are important to adopt and upgrade combat strategy over a period of time. Enhancing the capacities of health workers and mental health institutions to deal with the mental health of patients and quarantine population is also a priority area (Wosik et al., 2020). The pandemic response requires integrated proactive measures and capacities that involve all sectors and professionals from various fields. It is important to secure, coordinate, and involve interested institutions and stakeholders to enhance the effectiveness of COVID-19 combat strategy (Ballard et al., 2020).

The greatest challenge in managing a disaster like this is arranging and deploying all the necessary resources, reaching the disaster site in minimum possible time, and helping the areas begin the recovery process (Day, Melnyk, Larson, Davis, & Whybark, 2012). Early intervention, decision-making, and on-time delivery of services are key for addressing pandemics like COVID-19. All these together demand for proactive leadership, proper planning, and involving multi-stakeholders to control and eliminate COVID-19-like pandemics in the future (Holmes et al., 2020). A plan of action developed with the involvement of all the stakeholders and executed meticulously would definitely help the communities to face the pandemic complexities. Engaging with the existing health and community-based networks, media, local NGOs, self-help groups, schools, colleges, universities, local governments and other sectors, such as healthcare service providers, education sector, business, travel and food or agriculture sectors, using a consistent mechanism of communication is very important to develop a long-term financially viable, effective strategy and a set of positive interventions (WHO, 2020). The possibilities of IT-based technology, telecommunications, mobile technology, and social media platforms also need to be explored and integrated to the strategy (He, Zhang, & Li, 2021).

Best Practices for Managing the COVID-19 Pandemic

To effectively manage the pandemic and lessen its effects, multiple best practices have been identified. The significance of transparency, efficiency, and equity in pandemic response efforts has been demonstrated by the adoption of these best practices in both high-, low-, and middle-income countries. This underscores the importance of these principles in effectively managing the pandemic and minimizing its impact on healthcare systems and populations. Understanding the execution and implementation of these best practices is crucial to address such pandemics successfully in the future.

Pandemic management demands a multifaceted approach to effectively respond to the global threat. Clear communication is one of the best practices that must be employed for an effective pandemic response. This involves providing accurate, timely, and easily understandable information to the public to reduce fear and confusion, encourage adherence to public health guidelines, and foster trust in healthcare officials. This involves providing timely and transparent updates about the pandemic and involving stakeholders in decision-making processes (El-Jardali, Bou-Karroum, & Fadlallah, 2020). For instance, in the United States, the Centers for Disease Control and Prevention (CDC) offered daily updates on the pandemic and held regular briefings to ensure that all stakeholders were well-informed and engaged in response efforts (CDC, 2020).

Another effective approach is to collaborate with various sectors and stakeholders, such as governments, healthcare providers, and businesses, to leverage their resources and expertise. By doing so, it can guarantee the equitable distribution of essential resources such as personal protective equipment (PPE) and medical equipment, and promote well-coordinated response efforts. Rwanda's national COVID-19 Task Force devised a thorough plan that encompassed managing the pandemic, procuring and distributing PPE and medical equipment, and engaging and educating the community (Dzinamarira, Mapingure, Rwibasira, Mukwenha, & Musuka, 2022).

In managing a pandemic, it is crucial to prioritize equity and inclusivity by acknowledging the distinct requirements and viewpoints of marginalized groups like low-income individuals, racial and ethnic minorities, and people with disabilities. This involves addressing the fundamental social factors that influence health outcomes. Brazil's COVID-19 national Task Force has taken this approach by incorporating members from indigenous communities, who are at higher risk of contracting the virus due to inadequate healthcare and sanitation facilities. To safeguard and assist these communities, the Task Force has created a strategy that involves specialized measures (Flores-Ramírez et al., 2021).

In managing a pandemic, adopting data-driven techniques is vital. This entails leveraging data and technology to track the transmission of the virus, detect high-risk areas, and implement appropriate interventions. South Korea employed a thorough data-driven strategy for contact tracing and testing, which was

instrumental in containing the spread of virus during the early stages of the pandemic (Ferretti et al., 2020).

Strengthening healthcare systems is a critical aspect of managing the COVID-19 pandemic. Healthcare systems must have the capacity to respond to the pandemic and maintain essential health services. In Kenya, a COVID-19 response plan was developed that included measures to ensure that healthcare workers had access to PPE and training and that health facilities had the necessary resources to manage COVID-19 cases while maintaining other essential health services. This approach allowed Kenya to effectively manage the pandemic and limit its impact on its healthcare system and population (Wangari et al., 2021). Table 2 presents a summary of the best practices in managing the COVID-19 pandemic. Efficient management of COVID-19-like pandemic demands a well-coordinated approach among multiple sectors and stakeholders. The best practices described, which consist of clear communication, coordinated resource allocation, prioritizing equity and inclusivity, data-driven techniques, and reinforcing healthcare systems, have been derived from both high-, low-, and middle-income nations. These practices underscore the significance of openness, effectiveness, and fairness in responding to pandemics.

Issues and Challenges in Management of COVID-19

Most profound and consequential impact of COVID-19 was on physical and mental health, well-being, and livelihood of common people (Wang et al., 2021). COVID-19 has posed a new set of unforeseen challenges because all the sectors have been affected with severe job and profit loss, fall in production, and restricted or no migration or international movements (Paul et al., 2021). During the course of the pandemic, it was observed that the cases increased exponentially, the healthcare system reached the optimal operating capacity, and the patients did not get adequate medical care. This pattern of pandemic spread was observed even in most of the developed countries (Kringos et al., 2020).

Following COVID-19, it is necessary to adopt focused and sector-wide approaches to restore lives to normalcy and get the country's economy back on a growth trajectory. (Le et al., 2020). It is important to assess the severity or magnitude of effects with appropriate long-term research and interventions in which people's participation is ensured. The challenge is to integrate the approaches of vertical management into horizontal management to involve multistakeholders to work on the needs such as new technologies, flexibility, and innovation in addressing the COVID-19 by deploying all the necessary resources (Panneer et al., 2021). The maintenance of effective coordination between different stakeholders to fulfill the demand is very important (Janssen et al., 2010). There is need to increase humanitarian logistics service, neutrality, and impartiality to COVID-19 healthcare and livelihood-related issues (Tomasini & Van Wassenhove, 2009). The political leadership plays a major role in identification of issues, and proactive political leadership is required to ensure participatory, goal-oriented

Table 2 Best practices for COVID-19 pandemic management

Best practices for COVID-19 pandemic management	Description	Examples	Sources
Clear communication	Providing accurate, timely, and understandable information to the public to reduce fear and confusion, encourage adherence to public health guidelines, and foster trust in healthcare officials.	United States: The Centers for Disease Control and Prevention (CDC) offered daily updates on the pandemic and held regular briefings to ensure all stakeholders are well-informed and engaged in response efforts.	(CDC, 2020; El-Jardali et al., 2020)
Collaborate with various sectors and stakeholders	Collaborating with governments, healthcare providers, businesses, and other stakeholders to leverage their resources and expertise to guarantee equitable distribution of essential resources and promote well-coordinated response efforts.	Rwanda: The national COVID-19 Task Force developed a thorough plan that encompassed managing the pandemic, procuring and distributing PPE and medical equipment, and engaging and educating the community.	(Dzinamarira et al., 2022)
Prioritize equity and inclusivity	Acknowledging the distinct requirements and viewpoints of marginalized groups like low-income individuals, racial and ethnic minorities, and people with disabilities, and addressing the fundamental social factors that influence health outcomes.	Brazil: The COVID-19 national Task Force incorporated members from indigenous communities, who are at higher risk of contracting the virus because of inadequate healthcare and sanitation facilities, and created a strategy that involves specialized measures to safeguard and assist these communities.	(Flores-Ramírez et al., 2021)
Data-driven techniques	Leveraging data and technology to track the transmission of the virus, detect high-risk areas, and implement appropriate interventions.	South Korea: Employed a thorough data-driven strategy for contact tracing and testing, which was instrumental in containing the spread of virus during the early stages of the pandemic.	(Ferretti et al., 2020)
Strengthening healthcare systems	Developing a COVID-19 response plan that includes measures to ensure that healthcare workers have access to PPE and training, and that health facilities have the necessary resources to manage COVID-19 cases while maintaining other essential health services.	Kenya: Developed a COVID-19 response plan that included measures to ensure that healthcare workers had access to PPE and training and that health facilities had the necessary resources to manage COVID-19 cases while maintaining other essential health services.	(Wangari et al., 2021)

decision-making (Grint, 2020). The major challenges faced by multistakeholder approach include implementing an efficient, dynamic, proactive leadership that shapes such processes or decisions, organize stakeholder groups; and the lack of financial or technical capacities to implement multistakeholder platforms (Djalante, 2012). Table 3 presents a summary of the Post-COVID-19 crisis management and strategies.

Suggestions and policy framework

Having successfully combated and controlled COVID-19, the next task is to restore livelihood options because most of the people have been badly affected by the pandemic. This is essential to bring the country's economy back to the growth trajectory. For this, long- and short-term planning and interventions are required. The multistakeholder involvement, cooperation, and collaboration are key to address these areas effectively and efficiently within the shortest possible period of time (Memish et al., 2020). We propose the following broad guidelines for different stakeholders to effectively develop and deploy multistakeholder participation and networking in controlling the pandemic.

Government (Federal and State governments)

The Government must arrange for the necessary first-line health infrastructure and sufficient medical care facilities along with deployment of healthcare professionals, mental health professionals, development planners, and humanitarian relief workers (Edwards & Ott, 2021). The understanding and mutual respect between different sectors or departments and sufficient dialog between different actors is required (Sharma, Borah, & Moses, 2021). The Government must bring together and coordinate between clinical and social scientists, government and NGOs, affected persons, and experts from other relevant fields (Twigg, 2001). The Government has to promote participation, coordination, and cooperation among the multistakeholders, so that all dimensions related to the pandemic are addressed appropriately. Evidence-based interventions and policies must be given priority; the advisories and guidelines charted out by expert groups such as the WHO must be given adequate importance in the strategy planning or implementation (Ullah, Pinglu, Ullah, Abbas, & Khan, 2021). There must be adequate fund allocation for developing networks and partnerships. The government must facilitate the involvement of the community members to manage the risks and thus promote adoption of locally appropriate solutions (Carrasco, Ochiai, & Okazaki, 2016). Promoting evidence-based approaches would bring effective outcome, and multistakeholder platform will help achieve clear linkages between institutions, agreements, clear targets, accountability, and mechanisms of evaluation (Bäckstrand, 2006). Promoting the usage of e-governance and e-reporting system is also crucial to increase coverage and efficiency of the pandemic combat system (Hua & Shaw,

Table 3 Post-COVID-19 crisis management and strategies

Type of industry	Strategies (Short term)	Strategies (Long term)	Sources
Hospitality and tourism industry	Immediate recovery plans: Rehiring employees, making modifications and disinfecting the rooms, doing innovative advertisements and promotions to attract old and new customers, providing offers and discounts, requesting for tax waivers from government, taking loans from banks to invest in the business.	To provide food, beverages, and accommodation together. To focus more on attracting domestic customers.	Dayour, Adongo, Amuquandoh, & Adam, 2021
Health sector	To train the healthcare workers to face similar situations in future. To update the necessary emergency life-saving equipment.	To include more of contactless health services. To move in for digital technology and artificial intelligence to do contactless services.	Lee & Lee, 2021
Frontline health workers – Nurses	To educate them to be technology friendly, and to use smartphone apps for their work.	To go for digital literacy and to use artificial intelligence for contactless services.	Lee, Cho, & Shin, 2021
Health sector – Emergency hospital design and setting	To make an assessment of all the emergency hospitals setup during COVID-19.	To go for a comprehensive emergency hospital setting where every facility is available for the patients. To use digital technology and artificial intelligence in the emergency hospital settings.	Marinelli, 2020
Health sector	To study physical, neurological disorders and nutritional status of the survivors of COVID-19. To make the assessment to implement universal health coverage for all people.	Based on the outcome of the study to prepare a model to follow in future. To implement universal health coverage which is promoted by sustainable development goals.	Crispo et al., 2021 Verguet et al., 2021

2020). The promotion of public–private partnership for developing innovative solutions either to control COVID-19 or to promote livelihood in COVID-19 is also an important task for the Government (Kudtarkar, 2020). Developing and maintaining repositories is also the responsibility of government for which partnership with IT sector companies can be of much use (Budd et al., 2020).

Civil Society Organizations (CSO)

This comprises different organizations, including international aid agencies who work in the humanitarian service area. International aid agencies will be able to bring in the required technical expertise and international funds, whereas the local civil society organizations can take part in the ground-level preparedness, combat interventions related to COVID-19 (Fry, Cai, Zhang, & Wagner, 2020). There is need to develop the knowledge and do capacity-building for taking up activities of emergency relief operations, and COVID-19 combat work, so that the sector can contribute to tackle COVID-19 situations (Mohseni, Azami-Aghdash, Mousavi Isfahani, Moosavi, & Fardid, 2021). Apart from COVID-19 containment, these NGOs will also be having expertise and experience in dealing with mental health issues and provide appropriate care to the affected (Anand, Verma, Aggarwal, Nanjundappa, & Rai, 2021).

Local community

Local communities play an important role in reducing risks related to pandemics such as COVID-19. Along with vulnerable communities, involvement and trust-building to combat against COVID-19 can be intensified (Panigrahi, Majumdar, Galhotra, Kadle, & John, 2021). Local community knowledge and practices can be utilized; dissemination and local awareness methods like folk art can be used for propagating social distancing and personal hygiene etiquettes (Marston, Renedo, & Miles, 2020). Community representatives may provide helpful insight on the local settings and act as main actors for dissemination information and as a primary communication or liaison link between the project officials, targeted communities, and their established networks (Li, Tan, Wu, & Gao, 2020). Legitimacy of the community representatives can be verified by talking informally to a random group of community members and heeding their views on who can be representing their interests in the most effective way. When the legitimate leaders who have high acceptance in the community are involved, the community's overall involvement and cooperation improves, which ultimately helps tackle the pandemic-related issues (Canals Lambarri, 2020).

Other stakeholders

Governments, Civil Society Organizations, communities, self-help groups, and other stakeholders, including other professionals and personnel, can perform

through the suggested model as mentioned in Figure 1, where at the center there will be Local NGOs and Local Self Governments (Municipalities or Panchayats), to effectively contain COVID-19. Scientists, volunteers, philanthropists, social workers, doctors, psychologists, development and emergency planners, and humanitarian relief workers must be involved in good faith and trust (Moradian et al., 2020). Their professional training, resources, skills, and expertise can be utilized to provide effective and efficient services related to COVID-19 control. Public health workforce development will be supported to ensure that a complete spectrum of expertise is covered including epidemiologists, data managers, laboratory technicians, emergency management and risk communications specialists, and public health managers (Lavazza & Farina, 2020). The services and expertise of other partners such as Red Cross humanitarian workers, National Service Scheme volunteers, National Cadet Corps, and police officials, charitable organizations, private and public sector companies, traditional media (television, radio, and print media), participants of social media, politicians or elected representatives, other national and international health organizations and NGOs, local businesses with international links, and the public at large other ministries (Environment, Finance, External Affairs, Home, etc.) can also contribute effectively (Anwar, Malik, Raees, & Anwar, 2020).

Conclusion

The review emphasizes how crucial the role of multistakeholder cooperation is in lessening the effects of pandemics and disasters. It illustrates how varied collaborations can result in more adaptable and successful solutions. In order to

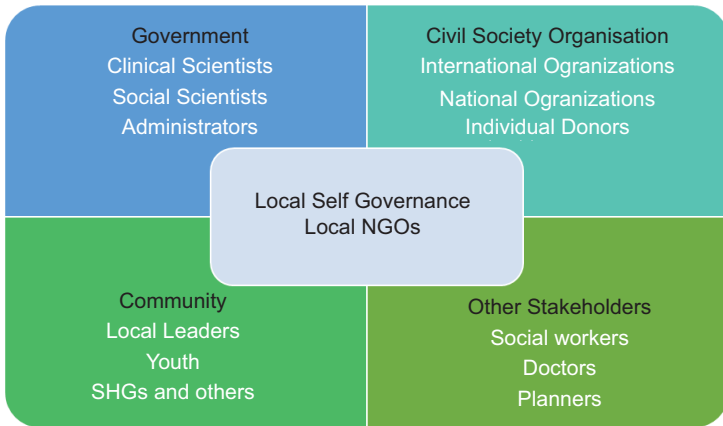


Figure 1 Engaging all stakeholders: A model for effective COVID-19 control and prevention.

ensure that lessons from recent experiences like COVID-19 are incorporated into future disaster risk reduction efforts, the study looks ahead and calls for a persistent focus on novel and inclusive techniques for stakeholder participation. Disaster Risk Reduction including pandemics needs transformative approaches, systems, strategy, and new technologies, which are to be adopted with flexibility and innovation. The approaches have to be changed from single-direction approach to a comprehensive approach. There need to be a change from the traditional system of administration to a modern citizen-centric management system with networking and collaboration by engaging multistakeholders and contributors. It is important to facilitate the collaboration of multiple stakeholders to create synergy to manage risks for effective disaster risk reduction. This in turn also brings resources into a system such as new innovative ideas, experience, skills and competency, technology, and professionalism. It is important to partner with global-level multistakeholders of multilateral or bilateral agencies and look for opportunities to promote public–private partnership to develop appropriate Disaster Risk Reduction strategies and resilience plans. The disaster intervention should focus on evidence-based interventions and approaches to bring better outcome of mitigation, rescue, relief, and rehabilitation. The COVID-19 pandemic has taught a lesson that networking and collaboration are significant for the effective governance of COVID-like pandemics in the near future, where the role of the multistakeholders, local, public, and community civil society groups, and public–private partnership is inevitable.

Conflicts of Interest

The authors declare that there are no conflicts of interest to disclose. All authors have read and agreed to this version of the manuscript.

Authors' Contributions

SP contributed to the conceptualization of the article. SP, LB, and RRP contributed to the methodology. The data analysis synthesis was done by SP, SD, LB, and RRP. The writing and preparation of original draft was done by SP, SD, RM, LB, RRP, and VSA. SP, SD, LB, PCK, RRP, and VSA contributed to the review and editing of the manuscript. The visualization and supervision was performed by SP, SD, and LB.

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