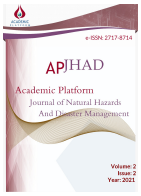

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How Do Social Networks Have Become the "Panacea" or "Protective Firepower" of Flood Victims? A Case of Community Flood Disaster Management in Sri Lanka

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Abstract

Social support networks have been become one of the mostly influential metaphors in many areas around the world, especially in terms of mitigating disaster consequences and revivifying disaster affected livelihoods. More importantly, reciprocal supports ties are more powerful in healing disaster wounds of communities. Especially social capital legacies enrich by reciprocal support networks by the ways in which making may hopes among disaster victims. In this context, the objective of this study is to investigate the social support network behaviors in supporting 16 flood-affected households in the mass flooding event occurred in 2017. Particularly, the study researched social support network behaviors at different flood inundation phases such as before, during, and after. This study collected primary data (mainly social network data) using household survey and filed observations. The study used the Social Network Analysis (SNA) method for the network data analysis. This article shows that flood affected households have received social network supports in different magnitudes at before, during, and after flood inundation phases. More importantly, provision of foods, water and basic needs, sheltering, clearing contaminated households, and emotional supports have mobilized and reciprocated among victims in reviving their livelihoods. The social support network legacies have evolved at different flood inundation phases. This study fills the gabs in the flood disaster discourse on Sri Lankan context.

Key words: Sri Lankan floods, Social support networks, resource mobilization, evolution of support networks.

1. Introduction

Natural disasters have dramatically been escalating not only in the global north, but also throughout the global south as well. Especially meteorological disasters such as severe floods, cyclones, and drought (e.g. wildfire or forest flyer because of the heatwaves) have come to the fore [1-4]. The main reason behind these escalating natural calamities is the adverse climatic change that has been experienced everywhere in the world [5-6]. Especially, Turkey, Germany, and USA have been experienced torrential rains and sudden flash floods very recently triggering gigantic consequences/damages to human lives and property [7-9]. Particularly, recording rain falls in first time on the peak of Greenland was an unexpected event. Scientists say that this is a very stark sign of future climate crisis [9]. This special natural event implies that the global temperature has adversely been rising. This circumstance accounts for the rapid melting of Ice caps and definite sea level rise. The IPCC warns that these tipping points drive towards a range of catastrophic disaster events around the world. In contrast, according to the recently revealed information, more than 200 international "health journal" have been urged world leaders that

the needfulness of immediate actions to mitigate meteorite climate crisis and impasses all around the world [10]. This is because the health of communities around the world has been challenging due the rapid increase of the global temperature. In accordance with their request, we should have to keep the average global temperature rise below 1.5C. Similar climatic narratives have been experienced in South Asian developing countries such as Sri Lanka, India, Pakistan, and Bangladesh [11-14]. Especially, Sri Lanka is as an Island country has dramatically been experienced mass flooding events for decades as consequences of rapid anthropogenic activities [15-19]. Sri Lanka has been experiencing torrential rains during the South-West monsoon period, generally it is lying from May to September every year [11]. This is because, in particular, rural areas of the country which are situated in the wet-zone catchment, experience tremendous consequences due to natural calamities like flood disasters.

According to the extant body of literature, currently there have been a new popup of research applications that concerned the abilities of social support networks and social capital mobilizations in healing disaster-driven community wounds [11, 15, 20]. Nevertheless, social network activities in community development have been researched for decades. Social networks have mattered in disaster risk reduction and management in many ways, this is because, basically social networks and community organizations are the first metaphors that touch the people's hearts at ground level basis and also they have much enough prowess to revivify victims' livelihoods. This may because the social support networks and related social capital have been considered as the panacea of disaster management [15]. Similarly, the existing body of literature exemplifies the pivotal narratives on how social networks and social capital have been mattered in terms of facilitating a plenty of ways to solve societal issues. In particular, dissemination of information, provision of shelters, water, foods, and basic needs, and evacuation practices etc. are paramount important mobilizations that made by social networks in the disaster events [20, 17]. Stevenson and Conradson point that based upon the 2010/11 Canterbury earthquake disaster event, the affected community received a range of supports, including material, monetary and emotional [21]. Mayer's study found that the non-financial supports are prominent among the supports mobilized through social networks compared to the financial supports [22]. In a case of Bangladesh flooding, Rotberg found that informal and formal social networks have played a cardinal role in providing and mobilizing many resources among rural flood victims [23]. Misra and colleagues demonstrated that social networks have facilitated in disaster preparedness and community resilience at different disaster phases regarding a cyclone-affected community in India [24].

In the Sri Lankan flood disaster context, the villagers have developed their own adaptation and resilience mechanisms, on the one hand, in order to mitigate adverse flood disaster impacts and on the other hand, in terms of developing livelihood revivifying practices thanks to the rich social support network legacies of especially in rural areas [11]. Especially, bonding, bridging, and linking social capital (e.g. structural) cumulatively mobilize through social support networks, when the community faces unexpected calamities such as flooding events and in the case of Sri Lanka, these practices have been evolved for decades traditionally thanks to the country's rich native ethos and cultural knowledge practices [11, 25]. Nevertheless, the research applications on social networks behaviors in the disaster management is lacking in the Sri Lankan context [26]. Since the climatic change calamities have been escalating around the world [27], the community resilience has come to the fore [28]. In this context, the objective of this research is to examine the behaviors of social support networks at different flood inundation phases, in five different flood affected rural areas in Sri Lanka. More importantly, this study will bridge the gaps of the extant body of literature by investigating the social network behaviors at different flood-inundated phases in flood affected rural areas on Sri Lanka.

2. Materials and Method

2.1 Study Area

The study conducted in Ovitigama Grama Niladari Division (GND), which is one of the mostly affected GNDs in Kuruwita District Secretariat Division (DSD), by 2017 mass flooding event, situated in Rathnapura district, Sri Lanka. By considering the flood damages that experienced due to 2017 mass flooding event, the study had been selected. More importantly, the study area is located in the wet-zone catchment of the country that has been experienced torrential rains during the South-West monsoon period. The study area has been experienced river flooding due to the overflow of Kuru River, which is one of the main tributaries of Kalu River, Sri Lanka. Geographically the study area lies between 5°.41′ – 6°.52′ north latitudes and 80°.15′ – 80°.28′ east longitudes. The current total population of Ovitigama GND is 1,147. According to Opanayake GN office, the unemployment rate of this GND is 4.24%. More importantly, the majority of population of this GND are occupied with agricultural practices such as tea plantation, paddy cultivation, and rubber/latex industry in addition to the gem mining industry. Many gem mines can be found within the close proximity areas to Kuru River and also nearby areas.

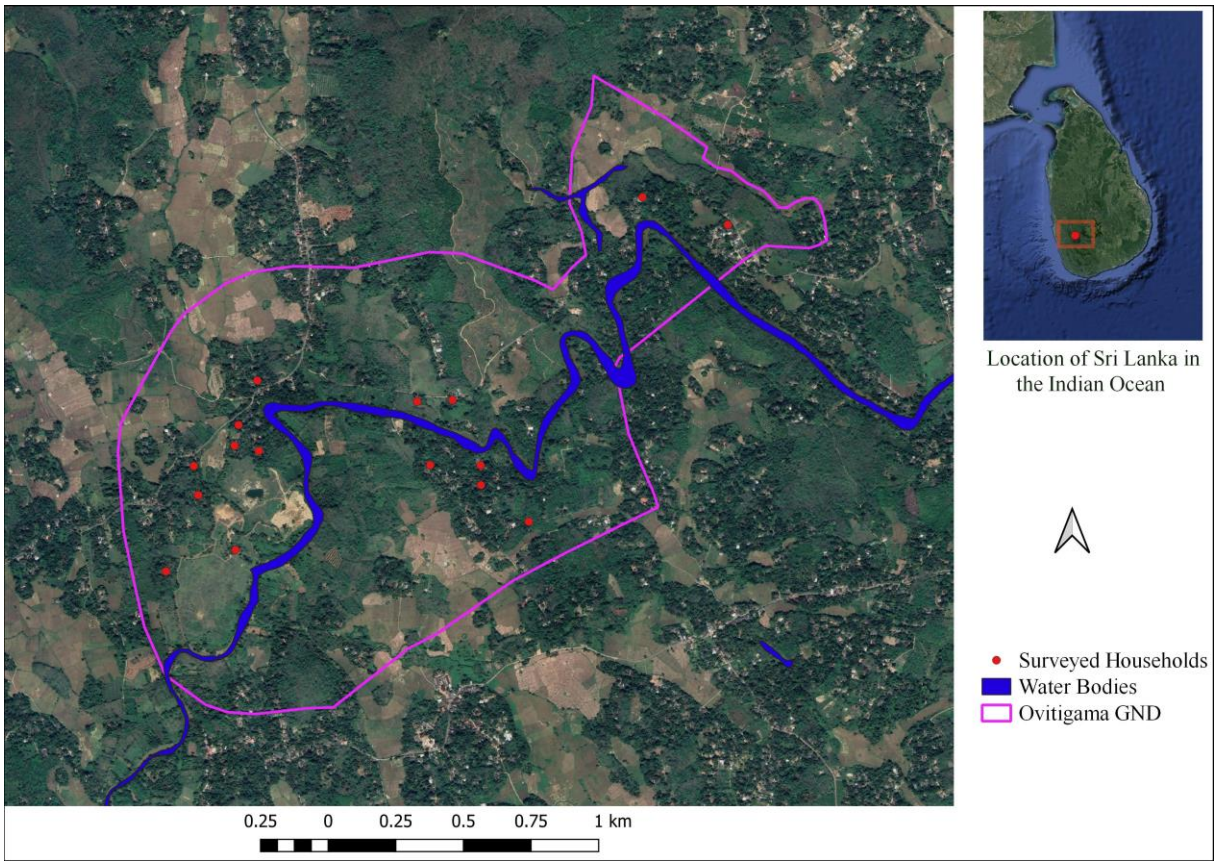

Figure 1. Relative locations of surveyed households and study area
Source: Cartographic design and compilation by the author, 2021.

2.2 Data Collection

The study considered primary data for social network analysis. The mostly affected households in the considered GND were listed, and the list has been used as the sample frame of the study. The simple random sampling procedure was occupied for primary data collection, since each and every observation unit (e.g. household) has an equal chance to be selected for the sample

under that procedure. Particularly, interviewees were asked to participate in the household survey if they only had the experiences on the immediate past flooding event with their consent. Regarding the social network data, participants were asked to list out mostly helped personals (e.g. up to 10) including their relationships to households and the way/type of helps rendered and their residential location etc. The study considered three phases of flood inundation, such as before, during, and after inundation phases. The average time duration for a questionnaire/one household was ranged from 50 minutes to one hour, in some cases, more than one hour. In addition to the household survey, the study considered focus group discussions/FGD (n=2) involving around 20 participants. More importantly, the author also used self-field observation data especially regarding the understanding of social support network behaviors at before, during, and after flood inundation events. In particular, Grama Niladari Officer (GNO) also rendered his fullest support for identifying household and gathering primary data and information. GNO's past experiences on flooding events gave much information and pivotally important aspects on mass flooding events. Altogether with the respondents' experiences, they gave very much and overall understandings, and insights in terms of shaping the research outcomes. In other words, their credible experiences are basically very much worthwhile for advance the research applications of this study. The study also used the secondary data (e.g. GIS layers) such as administration boundaries, Satellite imagery (Google Earth) and water bodies.

2.3 Key Methods

The study mainly adapted the Social Network Analysis (SNA) method in order to systematically summarize and analyze the behaviors of social support network in the flood disaster events. The SNA mechanism is identified as one of the best methods in terms of understanding and analyzing the network behaviors of communities [29]. Especially social support network and interlaced community organizational activities have importantly been considered as influential proxies in disaster risk reduction and management [26], [20]. The software called UCINET (version 6) [31] was used for network data analysis and network graph visualization. In addition, QGIS 3.20.0 was used for the study area and household mapping purposes.

3. Empirical Results

The analysis of the findings was revealed that different social support network actors such as relatives, friends, neighbors, volunteers, and government officials (e.g. GNOs) have reciprocated different supports hands such as evacuation, provision of foods, water, other basic needs, and shelters, emotional supports, etc. at before, during, and after flooding phases at different magnitudes. More importantly at the after-flood inundation phase, there are many support ties were observed compared to the rest of before and during phases (see, Figure 4). The main reason behind these many reciprocal ties appeared at the after phase is to support flood victims to clean their contaminated (e.g. mudded) and damaged households and public places, and in particular, to render emotional supports for healing their flood disaster wounds. The social support networks have become pivotal especially in revivifying affected livelihoods.

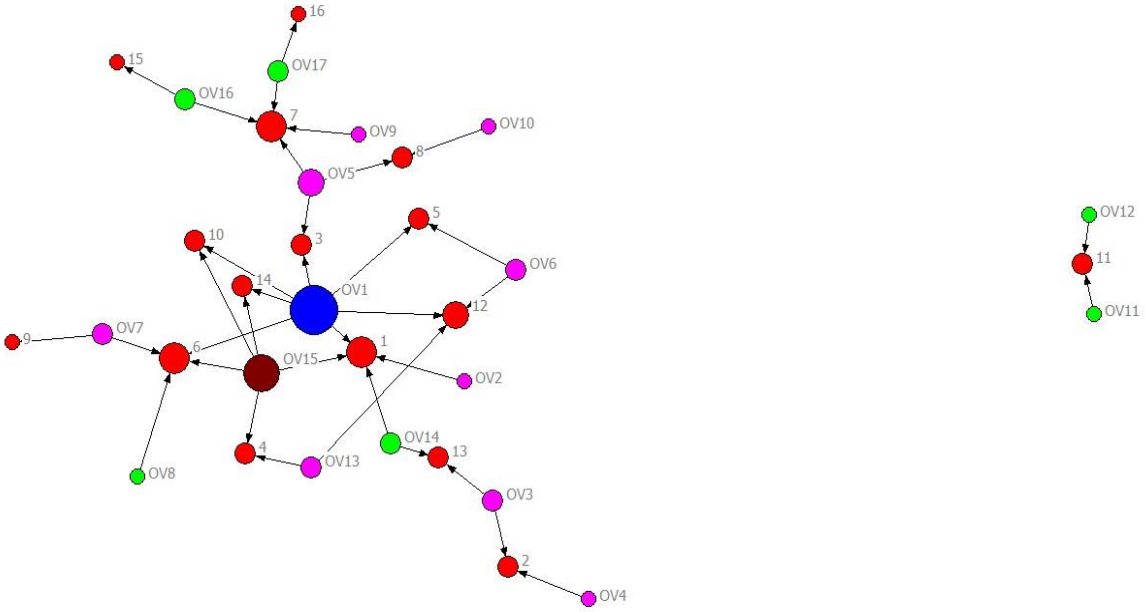

Figure 2: Social support networks at before flood inundation phase, Ovitigama GND. *Notes: The size of each node represents their degree density (proportional). Colors of nodes: Red for surveyed households, Blue for GNO or authorities, Pink for relatives, Green for neighbors or friends, Brown for volunteers.*

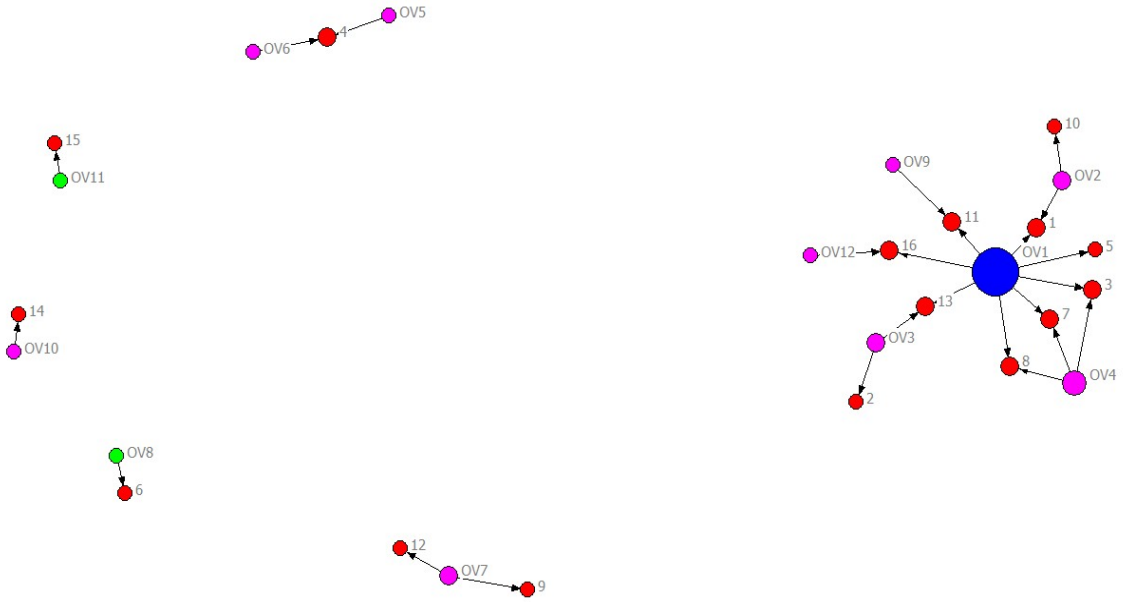

Figure 3: Social support networks at during flood inundation phase, Ovitigama GND. *Notes: The size of each node represents their degree density (proportional). Colors of nodes: Red for surveyed households, Blue for GNO or authorities, Pink for relatives, Green for neighbors or friends.*

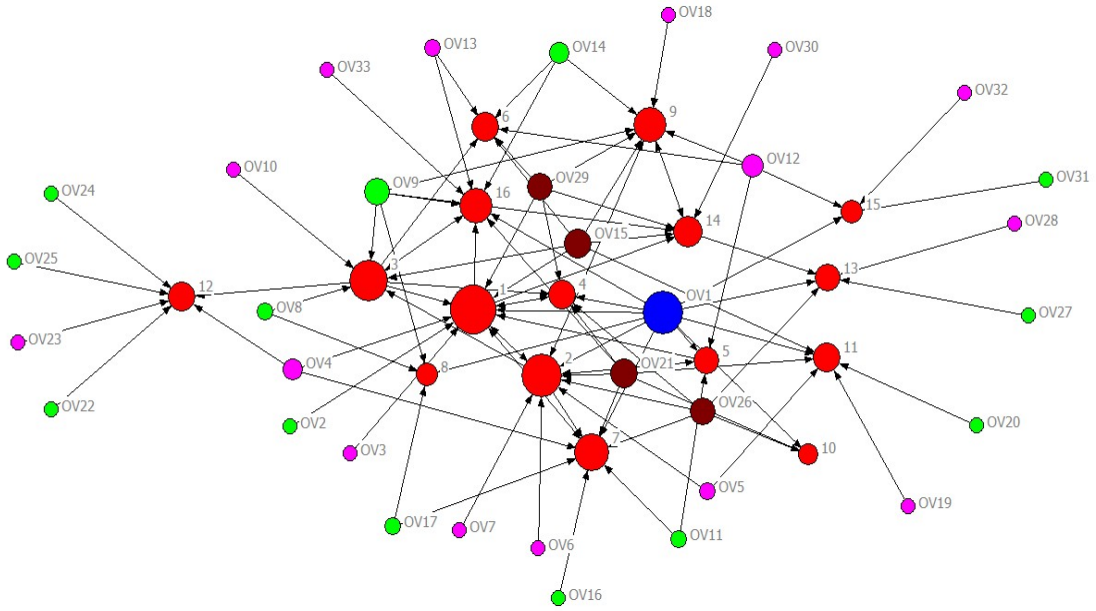

Figure 4: Social support networks at after flood inundation phase, Ovitigama GND. *Notes: The size of each node represents their degree density (proportional). Colors of nodes: Red for surveyed households, Blue for GNO or authorities, Pink for relatives, Green for neighbors or friends, Brown for volunteers.*

The study revealed relatively low network support patterns at the before and during flood inundation phases. For example, at the before phase, almost all the household (except the household # 11) have intertwined with different helping ties in order to respond the rushing floodwaters. On the other hand, no perfect links found among GNO and some of households, despite the majority of household have exemplified very close links with the GNO. The credible evidence (e.g. filed observations) also proved that the GNO has hardly been worked to reciprocate and mobilize resources among flood victims. Particularly, the GNO has continuously been involved with support activities at during and after flood inundation events as a responsible government agent. More importantly the respondents revealed their experiences of flooding events. It is observed that the relatives (pink colored) are predominant among the reported network actors in the all the phases compared to the rest of actors. It is appeared more network activities of relatives in the after-flood inundation phase rather than to their activities in the rest of inundation phases (Figure 4). On the other hand, very few (n=2) neighbors or friends (green colored) reported at the during phase while at the after phase (n=13) and at the before phase (n=6) indicated many respectively. Regarding the volunteers, none of actors reported at the during phase, compared to the before (n=1) and after phases (n=4). Especially, at the after phase, many ties are appeared since everything including inundated households and public places have to be repaired, rebuild and reinstalled.

One of the pivotal things is observed that they were provided fiber or wooden boats by disaster management authorities in order to provide facilities including floods, water and assistance for flood victims, in particular, at the during flood inundation phase. Despite, the majority of flood affected household members of Ovitigama GND urged that one of their urgent needs is to have around five to eight wooden or fiber boats for their evacuation plans (FGD-2). This is because, they have been experienced a rush and impasse situation, when many households are inundated and requested to being evacuated. Indeed, the field observations also proved that their request is fairer and need to be answered. It will absolutely help to be invigorated their livelihoods. Since, no schooling members also recorded in some affected households (Table 1).

Table 1: Sociodemographic characteristics of surveyed households

Key Components	Percentage (%)
Age groups	
<15	5.2
16-24	10.1
25-40	35.2
40-64	40.1
>65	9.4
Gender	
Male	48.8
Female	51.2
Education Background	
No Schooling	5.5
Below Primary	62.3
Above primary and secondary	30.1
Above Secondary	2.1
Employment Environment	
Employed	61.7
Unemployed (including students and kids)	38.3
Marital Status	
Married	77.5
Single	21.6
Other (separated, divorced, and widowed)	0.9

More importantly community organizations such as *Grama Sanwardena Samithiya, Maranadara Samithiya, Kantha Samithiya, Dayaka Sabawa etc.* have been shaping the village level resource mobilization process in terms of revivifying the flood affected livelihoods in many possible ways. Of course, such community-level organizations help to enrich the village level social fabrics/ties and social capital metaphors. Even though each and every community organization has their own objectives and missions, they cooperatively work to strength helping hands for the flood disaster victims. Their trusts, cultural and religious practices, norms, and beliefs have been intertwined people of their communities productively. This is because Ovitigama GND also exemplifies quite rich social network and social capital circumstance.

4. Discussion

The study demonstrated that almost all the surveyed household have received one or more supports form the social support networks. Social support networks are intertwined through different actors such as relatives, neighbours or friends, and volunteers and their ties. Relatives identified as the predominant networks actors that mobilized helps and resources among flood affected households, compared to the rest of actors. Of course, it is imperative that the family networks and their bonding ties have been become pivotal when the disaster events unfolded [11]. Spatial variation of flood inundation events has adversely been affected the pervasiveness of social support networks and resource mobilization [17]. In contrast, some affected households have not been received enough support due to the accessibility of variegated geographical settings. In some cases, the respondents pointed out that their households didn't receive adequate supports due the poor network situation of their households. Especially, they are internal migrator and have been dwelling there in Ovitigama GND for few years. This is one of the disadvantages of social ties and support networks [11]. The main reason behind this situation is that the trust and the longevity of the membership of village organizations [15]. On

the other hand, very few members of focus groups discussion revealed that they experienced such lopsided and unfair treatments may be due to their personal political ideologies (FGD-1). Of course, any kind of spurred exasperation can be arisen due to lopsided practices in particular, regarding the post-disaster management activities. Nevertheless, GNO emphasised that he did everything in order to revivify the flood affected livelihoods of Ovitigama GND and he treated each and every household in a fair-minded manner by considering their damages that experienced by past flooding event. Field observations suggest that collaborative supports are fundamentally pivotally important for helping flood victims to clean their mudded and contaminated houses and premises and until covert them into better places with decent living conditions. Of course, a range of helping ties have been reducing victims' perturbations, depressions, many mental illnesses and probably post-traumatic stresses [11]. In some villages, they have own contingency plans and indeed those are very crucial to face for the next calamity probably with almighty beatings and consequences. This is because it is well understood that keeping victims' mental health at a good level is a foremost important factor in disaster recovery practices and also to avert cascade disasters. These helping ties turned impasse situations into manageable circumstances, thanks to their altruistic nature helping each other. These notions have come to the fore in the disaster risk reduction and management practices. Personal observations and experiences proved that community support networks make big advantages for people who are living in often perilous flood plains.

More importantly the study demonstrated that the social support network legacies have evolved at before, during, and after flood inundation events. This evolutionary pattern exemplified that the structural changes of network graphs [17]. Moreover, the *de facto* tradition of helping others and their altruistic nature exemplify the sophisticated native ethos and rich cultural values of rural communities [11], [25], [30]. Yet, the rich social networks and social capital mobilizations can be observed among rural communities compared to the urban context of Sri Lanka, especially in the disaster events. This is because some good and material donations that received affiliated to 2017 mass flooding events have not been operationalized/utilized even after 6/7 months of the event. Especially school items such as bags, writing/exercise books, cloths, and many other items are appeared in the stores, according to the officials of Kuruwita DSD office. The various activities of reciprocal support networks are based upon the local level community organizations and their affiliated associations [20]. In particular, a range of social ties and related reciprocal activities have widely been shaped by the community level organizations. This is because complementary associations can be often seen between the reciprocal support networks and the community organizations. Of course, it is very obvious that much of networking activities can be observed in the areas with dense organizational and related social networks. Findings of the study show that the similar narratives regarding the formation of social support networks. All the forms of reciprocal activities enormously influence to improve and shapeshift of the resiliency of disaster victims [28], [20]. This is because reciprocal support network legacies have significantly influenced on rebuilding the resilience of flood affected livelihoods in many ways. Volunteerism is also identified as one of the key metaphors in the community disaster response networks for improving the resilience of victims [15]. Canterbury earthquake also exemplified the similar narratives [21]. They identified social networking as one of the ample components that provide a range of information and external supports in terms of maintaining the daily lives of disaster victims. On the other hand, the spatiality of social ties can be considered as the cardinal variable that governing the context of reciprocal support in the disaster events [20], [26]. More importantly, many of villagers shared their knowledge and knowledge practices with flood victims in good faith.

5. Concluding Remarks

Based on the empirical findings, this study demonstrates that social support networks significantly influenced for flood disaster response and recovery and a range of reciprocal exchanges have mobilized in terms of revivifying of adversely affected livelihoods by 2017 flood inundation event. Moreover, the study revealed undeniable evidence of evolutionary changes of support networks over time at different flood inundation phases. In particular, the helping ties have increased from before phase to during phase related to many surveyed households. And then, these reciprocal ties have further increased in the after phase in related to almost every household. The study also indicated that comparatively less reciprocal support ties are engaged in the low-depth flood inundated areas. And also, quite different mode of ties was observed in geographical variegated flood-inundated settings. In line with the study findings, it is observed that pervasive reciprocal support networks have potential strengths of reducing flood disaster risks and to heighten disaster mitigation practices through by many folds involving with a range of network actors such as relatives, friends, neighbours, government officers, and volunteers. Also, this study makes good assessment on flood disaster preparedness and recovery in Ovitigama GND area by analysing affected households' networks patterns and their evolutionary nature over time. Of course, abovementioned merits are solely based upon the sample size. The household survey engaged with 16 flood affected households belonged to Ovitigama GND that located in flood inundated rural context. This is quite a big task regarding collecting primary data on social networking at three different flood inundated phases. Overall, this study makes some inference and contributions to the debate of reciprocal supportive network legacies on flood disaster management, recovery, and risk reduction and also this study bridges the gaps of the extant body of literature of disaster management discourse in Sri Lankan context.

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Conflict of Interest

The author declares that he has no any of known competing financial interests or personal relationships that could be influenced the demonstrated facts in this paper.

Author Contribution

Author A. Karunarathne conducted the data collection, analysis and the preparation of the manuscript.

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