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Humanitarian Actors' Cooperation Network in the Social Sustainability Context—Evidence from Poland

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Abstract: The humanitarian sector is responsible for minimizing people's suffering during humanitarian crises and consists of several groups of stakeholders, who are named humanitarian actors (HAs). They play different integrative and supportive roles; however, intersectoral cooperation is not structured and usually relies on chaos. Thus, this research aimed to answer two questions: (1) what is the level of cooperation of Polish humanitarian organizations with other HAs?; and (2) who could be a leader(s) of humanitarian sector coordination and synchronization, to ensure social sustainability? The research was conducted among 100 Polish humanitarian organizations' at the turn of the year 2021/2022, with an anonymous survey. The main aim of the paper was to assess the HA cooperation network from the Polish humanitarian organizations' perspective. To conduct the research, a social network analysis (SNA) was performed. The results suggest a challenge in integrating HAs' activities. Moreover, their synchronization is hampered by the significant dispersion of activities and the multitude of HAs involved in humanitarian actions. As a result of the SNA, a set of four groups of HAs with different roles were distinguished: a group of leaders, a group of followers, a group of supporters and suppliers, and a group of secondary supporters.

Keywords: humanitarian actor; network; cooperation; social network analysis; social sustainability; Poland; humanitarian sector

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1. Introduction

Humanitarianism is an ideology that evolved from the activities provided by various humanitarian organizations and is concentrated on strictly social issues that concern the provision of humanitarian aid [1–3]. Its origins can be found in the observations of Henri Dunant, who initially established a field hospital as a result of the bloody battle of Solferino in 1859 [4]. The evolution of the idea of humanitarian during the 19th century resulted in the creation of the Red Cross movement, which formulated seven fundamental principles of humanitarianism: humanity, impartiality, neutrality, independence, voluntary service, unity, and universality [5]. Those principles are dedicated to the International Committee of Red Cross and Red Crescent Movement and its National Societies; however, the universality of principles, wide acceptance among stakeholders, and practical implications force other humanitarian organizations to accept these principles as binding. It is also a result of the so-called universality of suffering, the dignity of humans, and the requirement for life and health protection, as well as the promotion of aid provision, prevention activities, and international humanitarian law [5].

A humanitarian sector that is responsible for minimizing people's suffering consists of several groups of stakeholders, who are named humanitarian actors (HAs). They can be grouped into five interrelated categories [3]:

1. Humanitarian organizations, such as national or international non-governmental organizations and local ('my own') non-governmental organizations [6–10];
2. Governmental institutions, such as intergovernmental organizations, regional associations, governments, local authorities [11];

3. Rescue and supportive units, such as rescue units, medical staff, military;
4. Essential products suppliers, such as manufacturers, service providers;
5. Society, such as donors, recipients, churches, and religious organizations.

HAs play different roles in the sector and society; however, they are forced to cooperate in various dimensions (organizational, institutional, logistic, social, etc.) to provide humanitarian assistance and protection for people in need. Nevertheless, intersectoral cooperation is not structured and usually relies on chaos; thus, a wide set of challenges are apparent, such as storage and transport problems, due to the number of goods exceeding the needs of the suffering people [8], which results from a lack of coordination and synchronization of HAs' activities; inadequate quality of aid-related goods [8], due to acceptance of any level of quality of relief goods; and duplication of tasks and functions as a result of lack of cooperation [6–9,12] (a wider set of challenges that refer to the other dimensions have been provided by, e.g., Marcinkowski [3]). These challenges need to be addressed to minimize the suffering of people in need before a humanitarian crisis occurs, during its disastrous consequences, and after the crisis has finished, to provide people with humanitarian and development aid. Such a perspective requires adequate policies and perspectives, among which social sustainability plays a crucial role.

The discussion on the role of humanitarianism in the sustainability context has already been provided in the literature. Joshi et al. [13] discussed and assessed the effectiveness of humanitarian activities during the Covid-19 pandemic. The authors of the study provided an in-depth analysis of critical factors and concluded that a blockchain-enabled digital humanitarian network is essential in a crises such as a pandemic. The role of the digital transformation during Covid-19 has been also discussed by Lee et al. [14], who assessed how organizations should restructure to face humanitarian crises. Additional insight has been provided by Bala et al. [15], who conducted a case study of one of the donor platforms that emerged during the first phase of the Covid-19 pandemic. Their general conclusions were mainly associated with the business form of the supply chain; however, the authors argued that the particular donor platform might serve as a framework/template for other non-governmental organizations in the context of future humanitarian crises. Interestingly, there is a focus on the promotion of collaboration in such crises from the perspective of two HAs: civilians and the military [16]. This collaboration is critical and challenging, due to the diversity of viewpoints and ethical decision-making. The authors concluded that these viewpoints should be considered in the international cooperation of various HAs. This cooperation usually refers to the coordination of humanitarian organizations in the procurement of relief items. Decentralized coordination results in the duplication of tasks and harm to vulnerable people [12]. Their research identified that a lack of willingness for cooperation, poor communication, confusion about the division of responsibilities, or noncompliance with standards and regulations are the main challenges to fostering coordination among HAs. The necessity of coordination of international and local non-governmental organizations was also discussed by Chen, Liu, and Appolloni [10]. The authors suggested that conflicts of interests and different expectations inhibit cooperation and coordination. Nevertheless, resource sharing could improve sustainability and coordination. Interestingly, the collaborative field of sustainable development goals (SDGs) was analyzed by Moreno-Serna et al. [17]. In addition, transformation through partnerships is essential to the 2030 Agenda for Sustainable Development [18]. This also refers to the transparency needed for the appropriate quality of humanitarian activities. Public trust is crucial in humanitarian aid provision. It enhances performance, efficiency, and effectiveness [19].

The social sustainability context has been included in the literature recently. Most of the academic debates focus on the environmental and economic dimensions of sustainability [20]. Nevertheless, a social perspective is a part of a sustainable community that can be defined as "*places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all*" [21]. Similar understanding is provided by Woodcraft [22], who

stated that social sustainability is "*a process for creating sustainable, successful places that promote wellbeing, by understanding what people need from the places in which they live and work*". Factors that could ensure social sustainability include education and training, justice, safety, civil society, health, well-being, quality of life, social inclusion, networks and interaction, employment, residential stability, fair income distribution, cultural aspects, and active community organizations [23]. Such a perspective on sustainability fits directly with the concept of humanitarianism, with its direct focus on the social dimension.

This context consists of solutions, principles, and guidelines on how to improve human dignity and welfare. Societies that do not meet basic human needs are expected to receive support through proper national policies and activities. Nevertheless, areas in constant or ad hoc humanitarian crises seek support from non-governmental organizations (NGOs) that provide assistance and protection for vulnerable people. Tammar, Abosuliman, and Rahaman [24] discussed the connection of social capital and disaster resilience. The authors suggested that surviving future natural disasters require resilience fostered by a stronger and more diverse economy, but also a more economically integrated and diverse population. Yilmaz [25] analyzed the interplay between humanitarian assistance programs and the Turkish welfare system. As a result of the research, the role of the public sector is seen as increased, mainly in social assistance and health support and at the expense of NGOs. On the contrary, Strokosch and Osborne [26] focused on the social inclusion of asylum seekers in the post-crisis phase through discussion on how to link public service consumption and citizenship. Social policy is concentrated on public activities; however, the NGO sector plays an important role in social policy-making, as was found by Pinnock [27]. NGOs are seen as agents of civil society that help to fill the gaps in an inadequate welfare state. The conclusion of Pinnock's research suggests that social policy frameworks are shaped by NGO activities. An interesting conclusion was also provided by Bolderson [28], who stated that welfare policies need to reclaim independence from immigration policies; therefore, the role of international humanitarian law should be extraordinary. The above-mentioned research presented the idea of NGO and HA inclusion in social sustainability frameworks in all of the phases of a humanitarian crises. The cooperation of the involved organizations could ensure social sustainability. This is all the more justified that strict intersectoral cooperation of HAs, and the humanitarian logistics system itself, constitute sustainable solutions [29] and the inclusion of social policy mechanism, which is desirable in modern society.

Accordingly, the research conducted by the author aims to answer two research questions:

1. What is the level of cooperation of Polish humanitarian organizations with other humanitarian actors?
2. Who could be a leader(s) of humanitarian sector coordination and synchronization, to ensure social sustainability?

The research was conducted among Polish humanitarian organizations at the turn of the year 2021/2022. The main aim of the paper was to assess the HA cooperation network from the Polish humanitarian organizations' perspective. To conduct the research, a social network analysis (SNA) was performed.

This paper consists of four sections. The first is an introduction, where the background for dealing with the research problem is initially explained. The second section is the methodology and materials, where all the methods are explained and the research sample is presented. The third section consists of two subsections: (a) a macro-level analysis of the HA cooperation network is performed, (b) with a micro-level analysis of that network. The last section is a discussion.

2. Materials and Methods

The research procedure adopted by the author followed the idiographic paradigm and inductive reasoning. It started with a literature review in the field of humanitarian action, social sustainability, and network analysis. The author explored the insights of cooperation among various HAs in the context of the main actor being a humanitarian organization. To identify and measure relations among HAs, a social network analysis (SNA) was

applied. This method has been used to assess various types of relations in the humanitarian sector, with a strong focus on humanitarian logistics (see researches reviews by Simpson, Tacheva, and Kao [30]): in the form of communication patterns [31,32], humanitarian supply chain domain [33], evaluation of the response network [34], humanitarian relief logistical clustering [35], communication among disaster management organizations [36], and HA interactions concerning performance [37]. Nevertheless, there has been no research on the wider organizational and institutional cooperation of HAs that could constitute a coordinated and synchronized humanitarian network, and which could ensure social sustainability. As stated by Simpson, Tacheva, and Kao [30], most of the supply chain literature in this field provide a conceptual framework rather than empirical solutions to be applied.

The SNA was used to describe and assess relations that constitute the HA cooperation network. The general procedure of SNA consists of the following steps [38,39]:

1. Identification of actors and relations;
2. Gathering of adequate data;
3. Preparation of the matrix of relations;
4. Network analysis;
5. Results discussion.

Similar steps, however not directly indicated, have also been presented by Klimas [40] and Simpson, Tacheva, and Kao [30].

The actors in this research were humanitarian organizations in Poland, which assessed relations with other humanitarian actors from the perspective of organizational and institutional cooperation during various humanitarian crises (food insecurity (hunger, malnutrition), drought, desertification, shortage of drinking water, no access to water, diseases, epidemics, natural disaster with long-term community effects (e.g., earthquake, tsunami), healthcare deficit, armed conflicts (military operations, civil wars, acts of terrorism, genocide), refugees and external migrations, internal migrations (internally displaced persons), other chronic disasters/humanitarian crisis) in different parts of the World (European Union, Eastern Europe, Middle East, Caucasus, Central Asia, South Asia, Far East, North Africa, West Africa, Central Africa, East Africa, South Africa, other regions (e.g., South America)). Organizational and institutional cooperation is understood as undertaking any joint venture that requires the involvement of various stakeholders (in the research this refers to humanitarian actors (HAs)) with different expectations and needs. The gathering method chosen for the analysis was a sociometric approach, where respondents (humanitarian organizations) received a list of HAs with whom they might cooperate. Humanitarian organizations assessed cooperation with these HAs (see Figure 1) on a scale from 0 to 5, where:

- 0 means no cooperation of any kind (never cooperated with a given HA);
- 1 means one-time actions involving HA;
- 2 denotes occasional and irregular HA engagement;
- 3 indicates occasional and regular HA engagement;
- 4 denotes frequent and regular HA engagement;
- 5 means constant and lasting projects involving HA (permanent cooperation).

The data were gathered in the period from November 2021 to January 2022 from 100 Polish humanitarian organizations that provide aid-in-kind and technical aid (therefore not only financial aid) in an anonymous survey. Identification of the population of humanitarian organizations in Poland is rather difficult, due to there being no data on this statistical group in the Polish Statistical Office. A report in 2019, suggested that in Poland there are 88,000 non-governmental organizations (NGOs), while 7.5% (around 6600) of them dealt with social and humanitarian aid, according to their statutory activities [41]. These organizations provide aid-in-kind and technical aid, but also financial aid that exceeds the scope of this research. Some of the organizations might also be inactive or perform ad hoc one-off activities. Thus, the number of 100 humanitarian organizations constitutes an

assumption of ca. 10–15% of all humanitarian organizations in Poland, concentrating on the most active ones. The most active non-governmental or intergovernmental HAs in Poland can be divided into two groups: national and international HAs. The first group, national HAs, consists of humanitarian organizations, non-governmental organizations, and religious organizations, e.g., Polish Humanitarian Action (Polska Akcja Humanitarna—PAH), Polish Red Cross (Polski Czerwony Krzyż—PCK, as part of the International Committee of the Red Cross), Caritas Poland, Polish Center for International Aid (Polskie Centrum Pomocy Międzynarodowej), and Polish Medical Mission. The second group, international HAs, consists of humanitarian organizations, non-governmental organizations, and intergovernmental organizations, and includes, e.g., Oxfam, UN Office for the Coordination of Humanitarian Affairs (OCHA), United Nations High Commissioner for Refugees (UNHCR), International Organization for Migration (IOM), United Nations Development Programme (UNDP), and Doctors Without Borders. However, during this research, contact was established with 1216 NGOs, whereby 100 of them constitute a research sample (8%), as humanitarian organizations that provide aid-in-kind and/or technical aid. Some of the NGOs were not willing to participate in the survey or provide only financial aid. This made a full network analysis impossible. The research was conducted based on the undirected ties (the direction of the relation is therefore irrelevant). The humanitarian actors, which whom humanitarian organizations may cooperate (and with which relations were assessed), are presented in Figure 1.

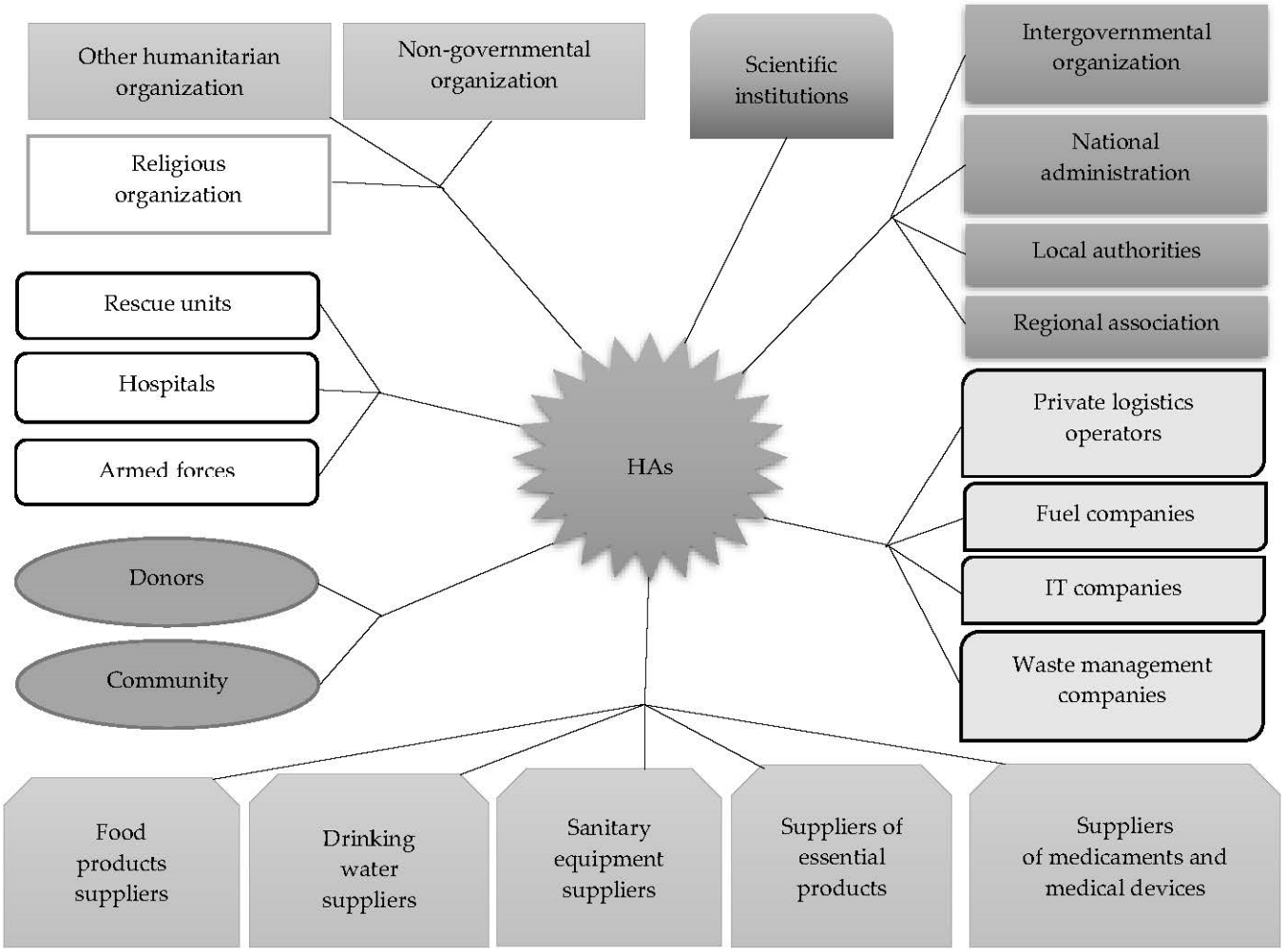

Figure 1. Humanitarian actors: stakeholders in the Polish humanitarian sector. Source: own elaboration.

The data gathered through the survey were then used to prepare the matrix of relations and network analysis. Due to the matrix size, it has not been included in this paper. Without having the possibility of conducting a full network analysis, the author of the paper focused on a vertical analysis of the network [39]. "*SNA allows to look at the network from the perspective of a comprehensive, specific group of companies and an individual participant*" [42]; therefore, a focus on the perspective of HAs and the entire network, to measure relations, was applied. This approach is discussed in the literature as a network level (macro-level) that helps to improve the whole network, and a node and ties level (micro-level) that tends to improve the position of a particular tie [39,40] (there is also a sub-network level (mezzo-level) that concentrates on the specific parts of the network and helps to improve the sub-network in the entire network [40]).

3. Results

3.1. Macro-Level Metrics of Polish Humanitarian Sector Cooperation

A SNA helps to answer several questions: which actors are central? What kind of role do they play? Which has more power than others? [42], and which generally correspond with the research questions of this paper. This is not a full set of the questions that could be answered through the SNA. The presented questions were chosen to analyze the research sample. A wider set of questions and purposes of a SNA were provided by Fuks, Kawa, and Pierański [42], Klimas [40], Simpson, Tacheva, and Kao [30], and Kawa and Czakon [43]. In terms of the entire network analysis, the descriptive SNA metrics and the univariate statistics of the dataset are presented in Table 1. Accordingly, a visualization of the HA network of cooperation based on the research sample is presented in Figure 2.

Table 1. Descriptive SNA metrics of the research sample.

SNA Metric	Description	Research Sample
Nodes (n)	May be called actors or vertices. The position of the node is a partial determinant of its opportunities and constraints. In the research sample, nodes represent humanitarian organizations that participated in the survey.	100
Affiliations (m)	May be treated as activity links, resource ties, or actor bonds. This informs about activities, resource elements, or bonds of two or more organizations that can be connected in different ways, or how the relationships have developed over time, how actors may perceive each other concerning each other. In the research sample, affiliations refer to the humanitarian actors (HAs) presented in Figure 1.	22
Network mode	The matrix of relations composed of the data gathered in the second step of the procedure. There are two types of network modes: 1-mode, when we want to analyze relations between nodes ($n \times n$); and 2-mode, when we want to analyse characteristics of ties through affiliations ($n \times m$).	2-mode
Ties ($n \times m$)	May be called edges. This is the total number of ties that are created by the nodes' (n) assessment of affiliations (m). Ties constitute the matrix of relations.	2200
Character of relations	Defines the complexity of the network and the structure of relations that may be directed: one-sided (asymmetric) or undirected, double-sided (symmetric). In the research sample, character of relations does not play an important role; the presence of a relationship was considered to be more important than its direction.	Undirected
Degree	The number of ties connecting a node to its network that measures visibility, influence, and potential as a coordinator.	Calculated independently for affiliations (m)
Closeness	Sum of geodesic distances to all other nodes, which measure access to information or risk of disruption.	Calculated independently for affiliations (m)

Table 1. *Cont.*

SNA Metric	Description	Research Sample
Betweenness	The proportion of all shortest paths between nodes in the network. In an undirected network, this is called the symmetric betweenness and detects key players and gatekeepers.	Calculated independently for affiliations (m)
Eigenvector	Vector of positive values in a binary matrix that indicates node connectedness within a network. A higher eigenvector indicates that the node is likely to be connected to other nodes that are highly connected.	Calculated independently for affiliations (m)
Density	The number of ties in a network divided by the total number of ties ($n \times m$, where n means a number of rows and m means number of columns in the matrix). Dense networks more easily develop common trust and behavioral patterns through facilitating flows of information.	0.675
Radius	The minimum eccentricity in the network. A node is central if its eccentricity is equal to the radius.	2.000
Diameter	The maximum eccentricity in the network. If the radius and diameter are equal, the network is self-centered (all nodes belong to the center).	3.000
Average path length (undirected)	Average geodesic path length in the bipartite graph, within components.	1.896
Transitivity	The number of quadruples with four legs divided by the number with three or more legs, in a bipartite graph.	0.755

Source: own elaboration with UCINET based on [30,38–40,42,44–48].

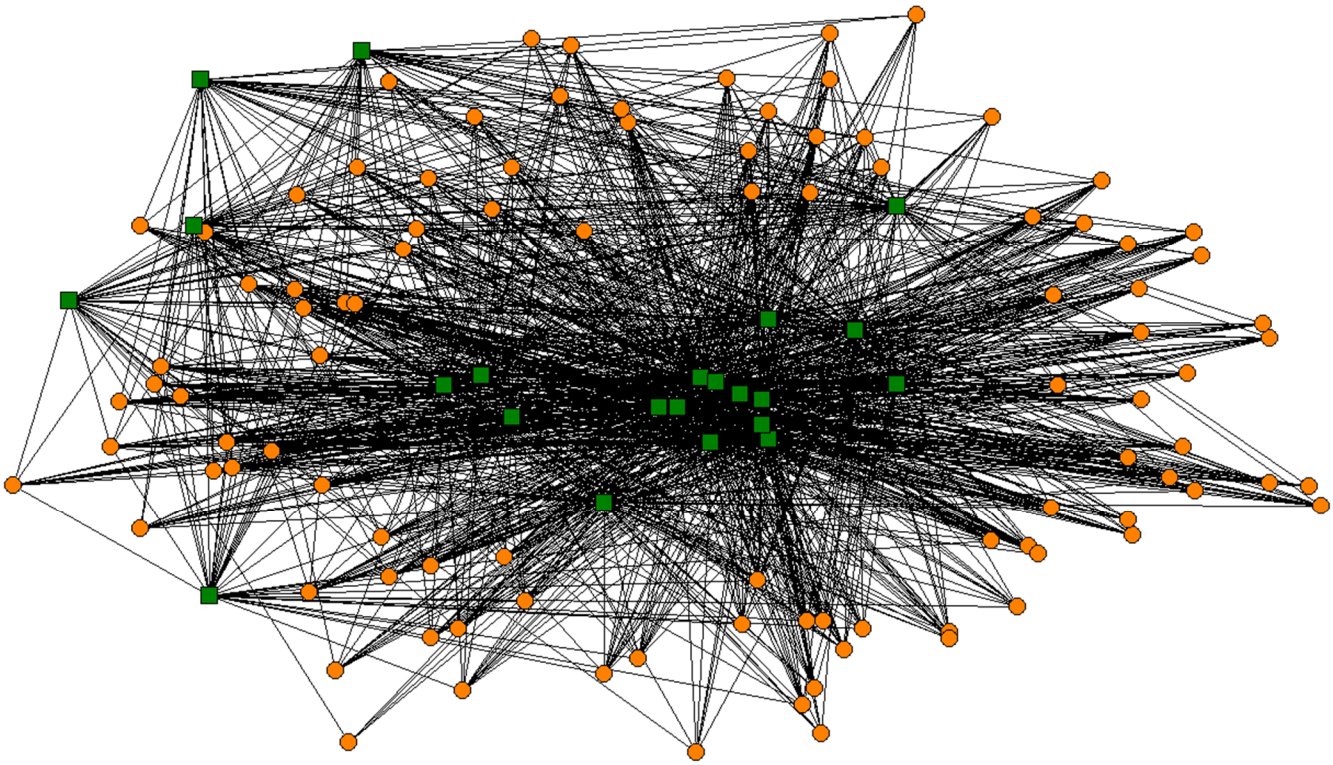

Figure 2. Visualization of a 2-mode network: HA network of cooperation. Circles represent nodes (n), while squares represent affiliations (m). Source: own elaboration with NetDraw.

The discussion results starts with a visual analysis of the network and continues with the univariate statistics of the dataset, which are presented in the previously-mentioned Table 1. The 2-mode undirected network may be characterized as a centralized network with an above-average density (0.675), which shows if the network is dominated by one

node or set of nodes. This suggests that there is no humanitarian organization (node) and HA (affiliation) that might be treated as a central tie in the research sample. However, there might be a leader or group of leaders in organizational and institutional cooperation during various humanitarian crises in different parts of the World, in terms of cooperation within Polish humanitarian organizations. There is a justified need to distinguish a set of HAs that could be followed by other HAs, in terms of ensuring social sustainability (direct or indirect; supportive). Affiliations in the middle of Figure 2 constitute the core of the network, which will be analyzed in the following part of the paper. These are HAs with the best ties with other HAs (affiliations) and humanitarian organizations (nodes). On the contrary, nodes and affiliations that are in the outer areas of Figure 2 are the network periphery, which is less connected in maintaining adequate relations in the sector. The analyzed network does not consist of isolated ties; thus, there are no barriers to the possibility of an organizational and institutional cooperation that could ensure social sustainability.

To visualize the role of the principal components in the research sample, Figure 3 was prepared. It groups nodes and affiliations in terms of their similarity in the analyzed field. However, no general conclusions could be formulated based on the visual analysis; therefore, an in-depth analysis had to be performed. The dispersed set of nodes is visible in the left side of Figure 3, with a strong possibility of grouping or clustering. On the contrary, a few groups could be created based on the affiliations in the right side of Figure 3. Humanitarian organizations, non-governmental organizations, donors, and the community constitute one of the groups; while national administration, local authorities, and regional association are the second, and waste management companies with sanitary equipment suppliers constitute the third group (top side of Figure 3). However, the visual and initial analysis of groups does not give any in-depth information on how these HAs cooperate with each other (affiliations) and the nodes (humanitarian organizations in the research sample).

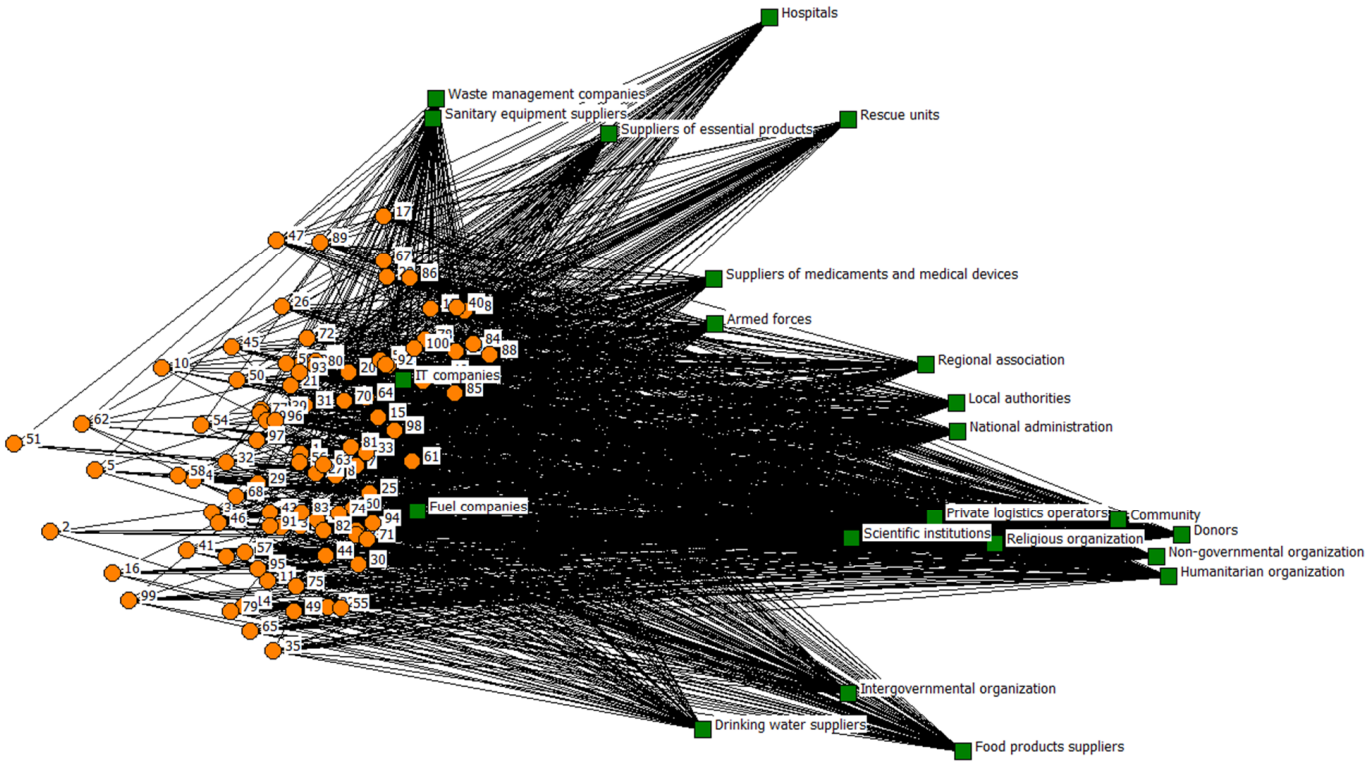

Figure 3. The 2-mode network from the perspective of principal components. Circles represent nodes (*n*), while squares represent affiliations (*m*). Source: own elaboration with NetDraw.

3.2. Micro-Level Metrics of Humanitarian Actors' Cooperation

A thorough analysis of the affiliations (HAs), with the use of the structural measures presented in Table 1, helped to identify the scope of relations. To conduct a macro and micro level of analysis, the vertical form of analysis was chosen by the author. Therefore, in the first step, the centrality measures for particular affiliations (m, see Table 2) were calculated. It should be pointed out, according to the SNA metric description presented in Table 1, that the higher the degree level, the higher importance, and connectedness of the node or affiliation. Due to the number of affiliations in the research sample (m = 22), all HAs are presented in Table 2. Affiliations were analyzed as focal actors and/or a set of actors with a similar number of ties and geodesic distances (degree and closeness), from the perspective of the various groups (or else clusters). Closeness and betweenness were calculated on binarized data, while the other measures used valued data.

Table 2. Centrality measures for affiliations (m).

No.	Humanitarian Actor	Degree	Closeness	Betweenness	Eigenvector
1	Humanitarian organization	0.940	0.922	0.068	0.280
2	Non-governmental organization	0.930	0.910	0.065	0.279
3	Religious organization	0.800	0.780	0.047	0.243
4	Intergovernmental organization	0.690	0.696	0.033	0.212
5	National administration	0.760	0.747	0.040	0.235
6	Local authorities	0.760	0.747	0.040	0.235
7	Regional association	0.750	0.740	0.041	0.229
8	Rescue units	0.680	0.689	0.031	0.212
9	Hospitals	0.610	0.645	0.023	0.196
10	Armed forces	0.600	0.640	0.025	0.184
11	Private logistics operators	0.770	0.755	0.047	0.230
12	Fuel companies	0.390	0.538	0.010	0.121
13	IT companies	0.370	0.530	0.009	0.118
14	Scientific institutions	0.710	0.710	0.036	0.217
15	Food products suppliers	0.790	0.772	0.047	0.237
16	Drinking water suppliers	0.590	0.634	0.025	0.181
17	Sanitary equipment suppliers	0.390	0.538	0.011	0.124
18	Suppliers of essential products	0.500	0.587	0.016	0.161
19	Suppliers of medicaments and medical devices	0.590	0.634	0.025	0.184
20	Waste management companies	0.380	0.534	0.008	0.125
21	Donors	0.940	0.922	0.069	0.281
22	Community	0.910	0.887	0.066	0.270

Source: own elaboration with UCINET.

The in-depth analysis of affiliations (HAs) gave results that could be generalized in the population if replicated in other humanitarian organizations and/or countries. First of all, HAs with degrees of at least 0.800 have a very similar level of closeness. Among them the following HAs can be distinguished (descending by degree): humanitarian organization, donors, non-governmental organization, community (affiliations with a degree over 0.900), and religious organization (degree 0.800). This measure shows how many nodes may maintain relations with this affiliation (HA). This is usually understood as a network connector [39]; thus, these HAs constitute a group of leaders in the field of organizational and institutional cooperation. This should not be a surprise, because these affiliations represent the third sector of the economy that focuses on the social inclusion of activities performed during various types of crises, such as humanitarian crises. Being a

hub for cooperation from the perspective of Polish humanitarian organizations suggests the implementation of solutions that should accelerate the transfer of knowledge among involved Has; improve communication; increase the supply of the workforce (for both workers and volunteers); allow integration of the involved HAs and synchronization of the dispersed activities, as well as coordination of cooperation; and foster effective social policy implementation in the field of ensuring human dignity, access to healthcare, social protection, or efficient migration policies. It is justified that the above-mentioned HAs have a high level of closeness, which informs how quickly it is possible to establish relations with other nodes and affiliations in the network. These HAs can capture knowledge (open and hidden) that is being transferred among the different ties but also support national and transnational social policies and ensure social sustainability.

Nevertheless, the levels of betweennesses are rather marginal; therefore, the occurrence of a particular affiliation on the route between other nodes is rare. This suggests that being a broker of information is hampered, and therefore, the control of information flow is difficult. This is a place for direct improvements in knowledge sharing and information consolidation, but also for more cooperation of HAs and national social policy entities. Moreover, similar conclusions can be formulated based on the eigenvectors analysis of the above-mentioned HAs. They are quite similar and range from 0.243 to 0.281; however, these are lower-average levels. Due to the dispersed competencies in providing humanitarian aid and cooperation with Polish humanitarian organizations (nodes), affiliations are not treated as ideal partners for cooperation. This aspect is rather challenging for ensuring social sustainability. The visualization of the first group of HAs is presented as an ego network in Figure 4; affiliations are at the core of the network, and thus could ensure social sustainability if they become leading coordinators and hubs for the transfer of knowledge among HAs.

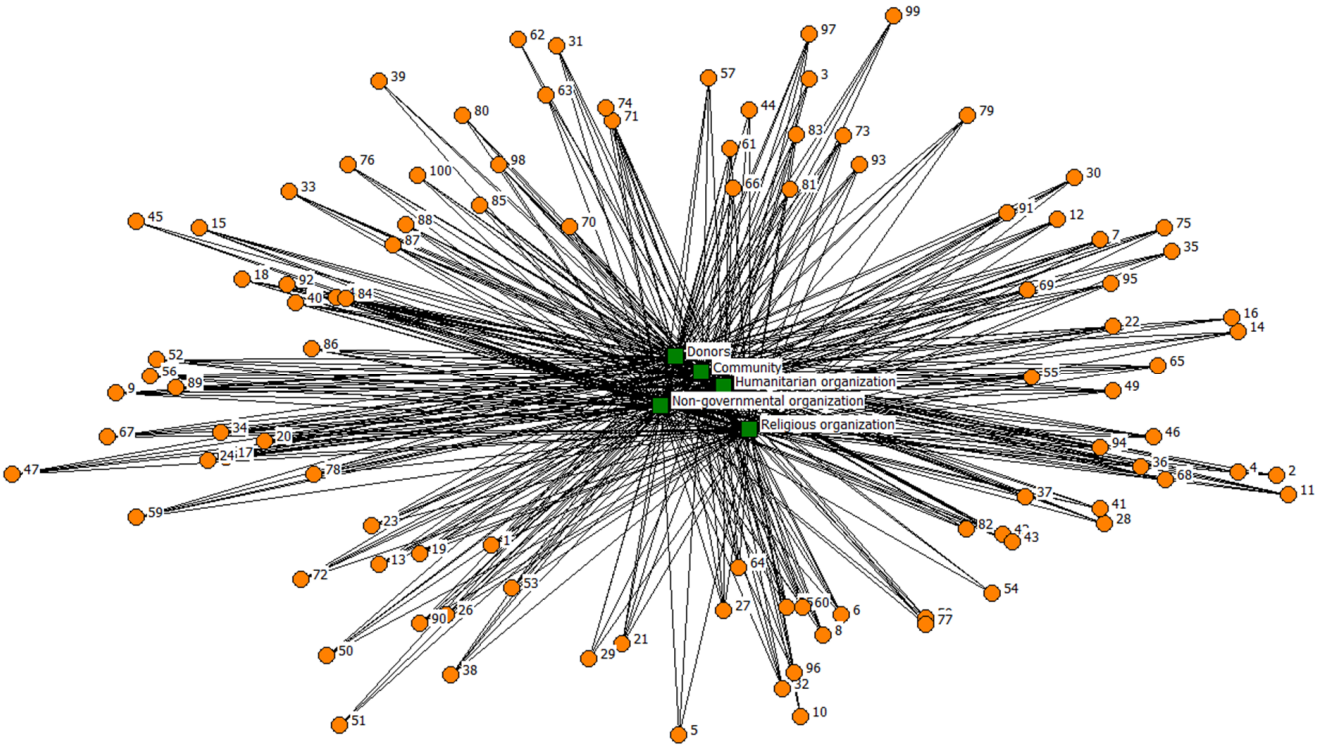

Figure 4. Network visualization for affiliations (*m*) with a degree of at least 0.800. Circles represent nodes (*n*), while squares represent affiliations (*m*). Source: own elaboration with NetDraw.

The second group of HAs, similar in terms of their place in the analyzed network, includes food product suppliers, private logistics operators, national administration, local authorities, regional associations, and scientific institutions (affiliations with a degree of

at least 0.700 but less than 0.800). An additional in-depth analysis of the result can be performed; however, the potential for being a leader for this group of HAs is lower than in the previous one. Interestingly, governmental institutions (local, national, transnational) still play an important role in organizational and institutional cooperation with Polish humanitarian organizations. This means that the first sector of the economy (public sector) should be treated as an important one for the synchronization of activities and coordination procedures, especially when we take into consideration the social sustainability and policy context. Without a doubt, providing humanitarian aid is associated with broad cooperation with authorities (in Poland, but also in the place of humanitarian crises). Furthermore, the second sector of the economy (private sector) also plays a crucial role in cooperation with Polish humanitarian organizations. Food product suppliers and private logistics operators are entities that provide aid-in-kind on one side, while transport and storage activities are on the second. Thus, the logistics aspect of humanitarian aid provision among Polish humanitarian organizations is a field of research that should be developed, as it was mentioned in the identification of humanitarian challenges. A visualization of the second group of HAs is presented as an ego network in Figure 5. Affiliations are still at the core of the network; however, they are rather scattered. This group of HAs could support the first HAs group by synchronizing humanitarian action activities, especially in the field of administrative and institutional tasks, as well as transport and storage processes. In the social sustainability context, they could foster knowledge sharing and become hubs for framework and mechanism implementation.

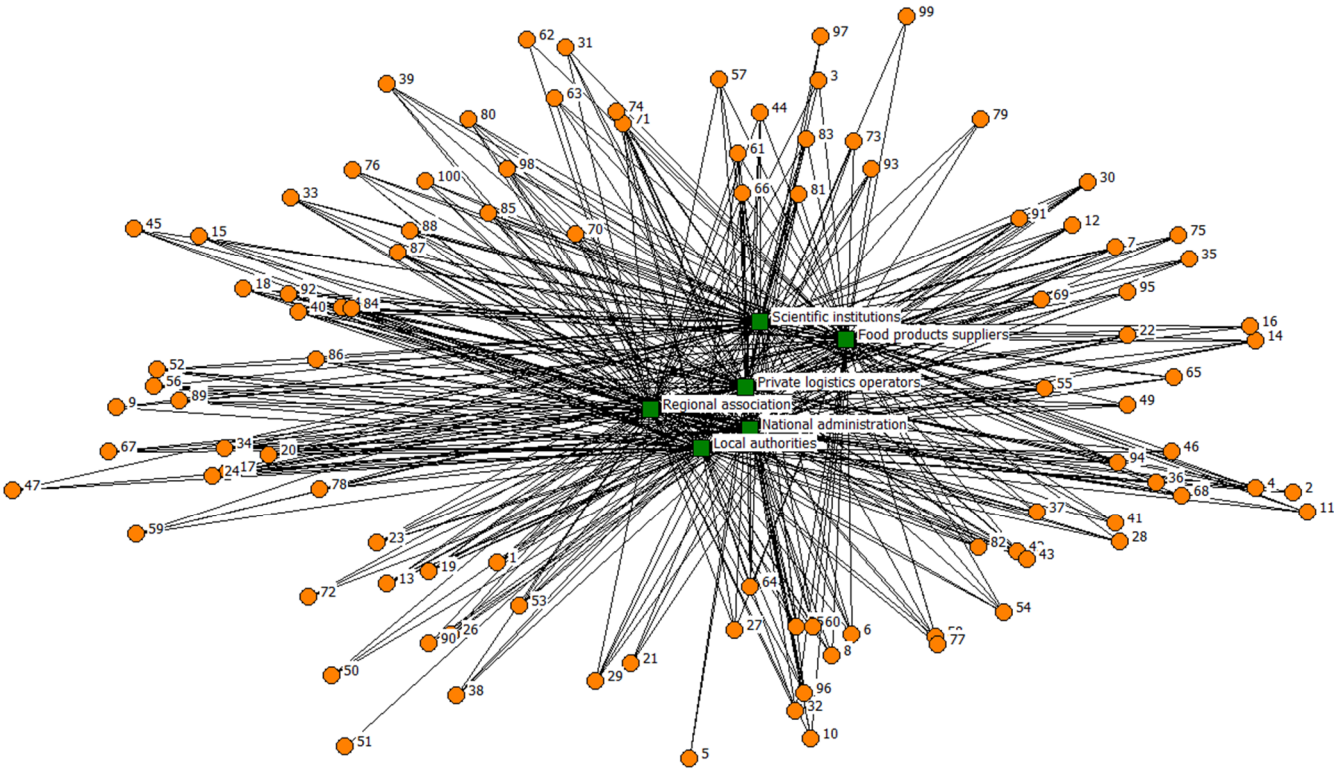

Figure 5. Network visualization of affiliations (*m*) with degrees between 0.700–0.799. Circles represent nodes (*n*), while squares represent affiliations (*m*). Source: own elaboration with NetDraw.

The third group of HAs has a degree of at least 0.500 and consists of the following affiliations (descending by degree): intergovernmental organizations, rescue units, hospitals, armed forces, drinking water suppliers, suppliers of medicines and medical devices, and suppliers of essential products. Therefore, here we have transnational governmental institutions from the first sector of the economy, but also direct rescue teams involved in providing humanitarian assistance and protection, such as rescue units, hospitals, and

armed forces. This group also consists of suppliers of products treated as aid-in-kind products, such as water, medicaments, or other essential products. This set of HAs does not have a direct impact on the creation of the entire network of cooperation (especially in the social sustainability context); however, they are responsible for providing proper support for an effective supply and distribution of aid-in-kind, as well as technical aid. The above-presented affiliations are not the main connectors in the network and, in terms of cooperation with Polish humanitarian organizations, cannot become leaders of that network. The functions they perform are related to supportive actions that help to minimize the suffering of vulnerable people (rescue units, armed forces, hospitals) or provide essential products to help people in need (suppliers of different kinds of products). Only intergovernmental organization stands behind the above-mentioned HAs (the other three authority-level HAs are in the second, very integrative group). This might be a place for improvement from the perspective of Polish humanitarian organizations that cooperate with intergovernmental organizations, such as the United Nations. They focus on precisely defined actions in the field of social sustainability that fit humanitarian assistance and protection solutions. A wide range of assets and possibilities for a quick reaction to humanitarian crises constitute an important role of intergovernmental organizations, and for a wider involvement in cooperation with Polish humanitarian organizations. A visualization of the third group of HAs is presented as an ego network in Figure 6. The location of HAs is outside the core of the network; however, they are still close enough to actively participate in the synchronization of humanitarian action activities. The supportive role of this group of HAs is essential in the first phase of a humanitarian crises, whose role is to minimize the negative effects of the occurred event; thus, it is necessary to prepare HAs organizationally for potential crises, as well as for social policy challenges.

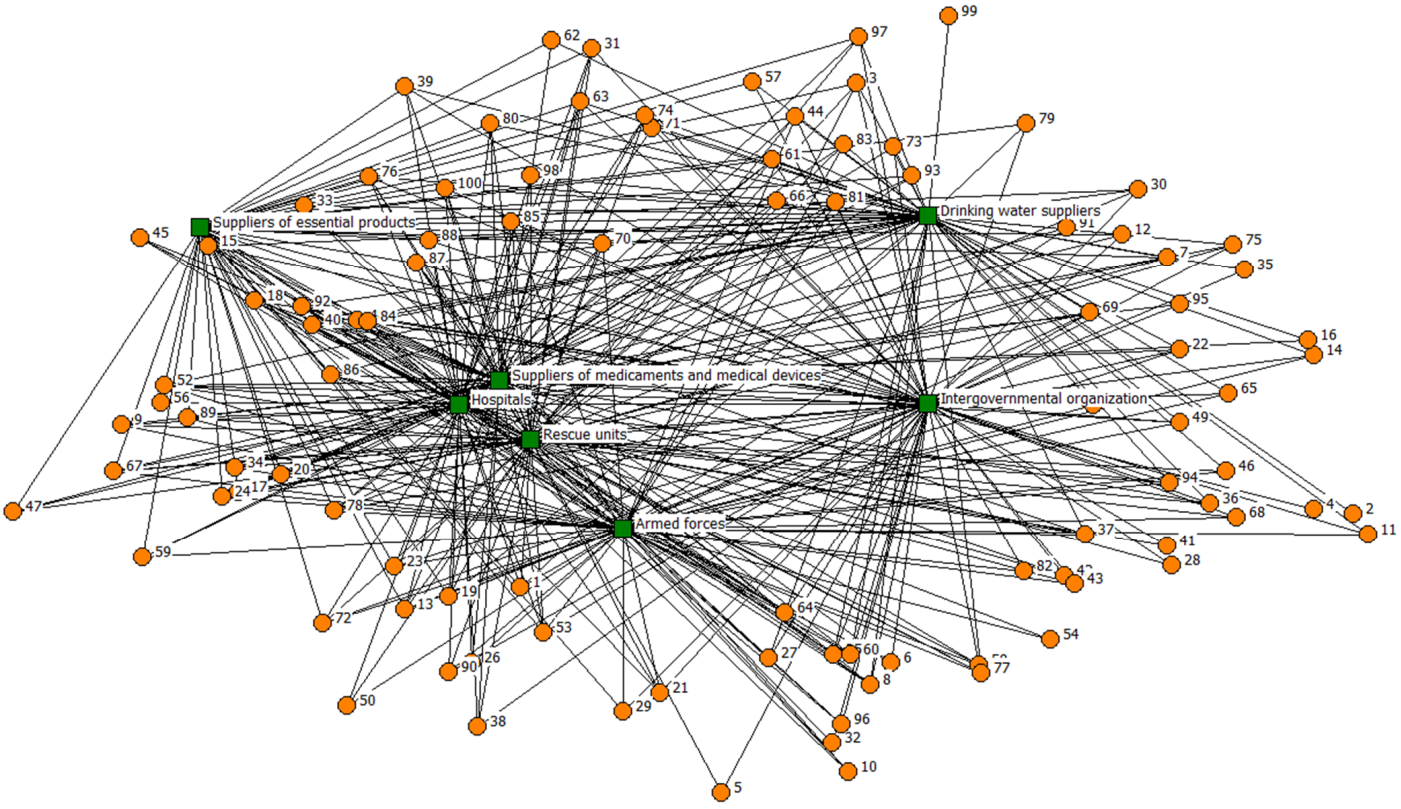

Figure 6. Network visualization for affiliations (*m*) with degrees between 0.500–0.699. Circles represent nodes (*n*), while squares represent affiliations (*m*). Source: own elaboration with NetDraw.

Lastly, the fourth group refers to affiliations with a degree below 0.500, such as sanitary equipment suppliers, fuel companies, waste management companies, and IT companies.

This is a group that fits the second sector of the economy (private sector), whose role is to support and supply activities in the field of humanitarian aid, also considering the perspective of social sustainability. The low degree levels (but higher closeness) show that these HAs do not maintain a wide range of relations with nodes. They could be characterized as dependent on the demand of Polish humanitarian organizations, but also other HAs involved in humanitarian action activities. Their supportive role excludes integration, but still could support the synchronization of humanitarian assistance provided by the different HAs. A visualization of the fourth group of HAs is presented as an ego network in Figure 7; they represent the periphery of the network with no direct impact on integrative processes and synchronization of various activities. These HAs should cooperate with other HAs groups; however, with a secondary level of cooperation.

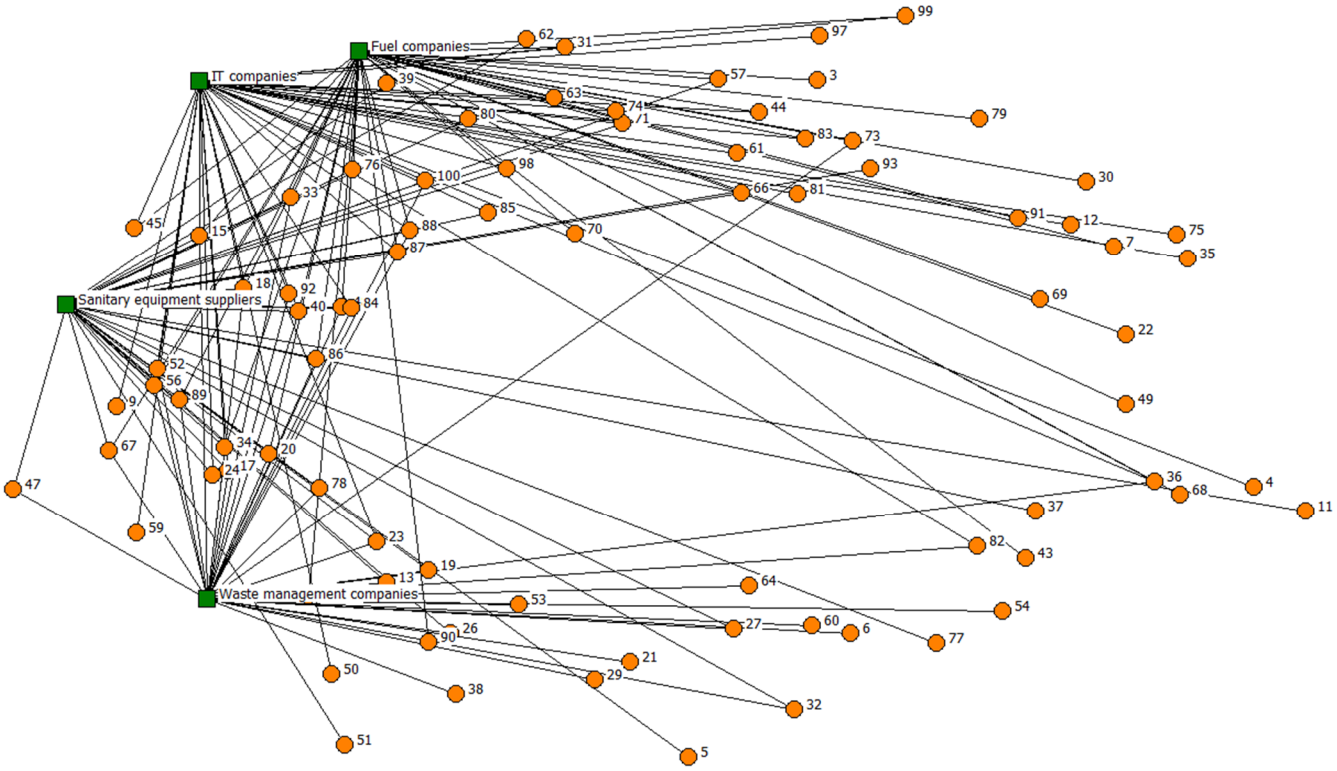

Figure 7. Network visualization for affiliations (*m*) with a degree below 0.500. Circles represent nodes (*n*), while squares represent affiliations (*m*). Source: own elaboration with NetDraw.

4. Discussion

The cooperation of HAs is essential for effective and efficient humanitarian action activities and, therefore, ensuring social sustainability. A dispersed structure of the involved stakeholders requires integration on one side and synchronization on the second. The chaotic character of humanitarian aid distribution that results from the unpredictable and unmanageable humanitarian crises (sometimes exacerbated by deliberate actions) makes it challenging to integrate HAs 'for the common good' of minimizing people's suffering. Accordingly, synchronization is hampered by the significant dispersion of activities and the multitude of HAs involved in a humanitarian action. Throughout the history of humanitarianism, various organizations and institutions have made attempts to effectively provide aid to vulnerable people. Nevertheless, it is humanitarian organizations on whose shoulders lies the provision of aid and assistance to people in need [3,6–10]. Thus, a coordinated and synchronized HA network is a desirable solution for ensuring social sustainability (in the creation of the sustainable community [20], with Woodcraft's understanding of social sustainability [22]) but also for proper social policy implementation in various fields [24–28], referring to, e.g., adequate migration policies, ensuring access

to healthcare or social protection, but also through enabling coordination procedures or creating hubs for framework and mechanism implementation.

The research conducted by the author among Polish humanitarian organizations suggests the possibility of the integration and synchronization of activities during humanitarian crises. The HA cooperation network in Poland, which is composed of various HAs, consists of the entities that could become leaders in the analyzed field, to ensure social sustainability. The level of cooperation of Polish humanitarian organizations can be summarized by the identification leaders and supporters, which directly responds to the research questions presented in the introduction section:

- The group of leaders that could be responsible for integrative humanitarian actions and synchronization of activities but also ensuring social sustainability, and effective social policy implementation, such as humanitarian organizations, donors, non-governmental organizations, and community;
- The group of followers that could become followers of the leaders and support synchronization of activities in the field of administrative and institutional tasks in the humanitarian sector or social policy, as well as transport and storage processes, such as governmental institutions (transnational, national, local), logistics operators, and scientific institutions;
- The group of supporters and suppliers, whose role is to minimize the negative effects of the humanitarian crises, to provide supplies of essential humanitarian products, and to participate actively in the synchronization of various activities, such as rescue and supportive units (rescue teams, hospitals, armed forces) or as suppliers of aid goods;
- The group of secondary supporters that cooperate with other HAs and are located on the periphery of the humanitarian sector, such as sanitary equipment suppliers, fuel companies, waste management companies, and IT companies.

To ensure social sustainability, considering its humanitarian context, it is therefore essential to coordinate and synchronize the above-mentioned groups of HAs (as coordination is seen as crucial to addressing challenges [10,12,16]). It is recommended to implement solutions referring to the transfer of knowledge among involved stakeholders, through the improvement of direct and indirect communication. Moreover, the network perspective proves that without proper coordination of intersectoral cooperation and integration of HAs, the challenges identified in the introduction section will not be resolved [3,6–10,12,16]. The context of social policy requires the active support of administrative units [26–28], in the form of the creation of hubs for framework and mechanism implementation, which in general support humanitarian organizations in dealing with challenges of the humanitarian sector. As was stated earlier, organizational and institutional support of social policymakers is crucial for ensuring human dignity for people in need through, e.g., adequate migration policies and ensuring access to healthcare or social protection. The HA cooperation network in Poland is assessed as above-average; thus, with huge possibilities for improvements under the social sustainability context. Nevertheless, the research conducted by the author has its limitations, which are listed below:

- organizational and institutional cooperation represents a wide understanding of cooperation among HAs that might be hard to manage and hard to improve; therefore, a more in-depth analysis should be performed from the perspective of specific areas of social sustainability, such as [23] justice, safety, well-being, quality of life, social inclusion (of e.g., refugees and IDPs), etc.;
- social sustainability is not only focused on improving the cooperation of various stakeholders, but also on implementing direct solutions for ending poverty and hunger, ensuring healthy lives, inclusive and equitable quality education, and the availability of water and sanitation for people, taking actions to combat climate change, promoting peaceful societies and justice for all, etc. A sustainable manner of the above-mentioned

selected Sustainable Development Goals [18] should be discussed more broadly, for their integrative implementation through adequate policies and activities;

- no direct social sustainability solution has been proposed that could support more integrative and synchronized activities of the various HAs. This perspective might consist of different policy-making institutions [25,28], from the economic, logistic, infrastructural, or social fields, and who have different methods and tools for implementing solutions at national and transnational levels. The proposed hubs for framework and mechanism implementation constitute general guidelines that require formulating in more detail.

Further research should, therefore, fill the above-mentioned limitations, with a strong focus on the practical inclusion of social sustainability into the humanitarian sector activities, whereby the logistical aspect of humanitarian aid provision might directly support the effective coordination and synchronization of HAs' activities. Moreover, more detailed analyses of humanitarian logistics cooperation networks can foster efficient and effective aid distribution to people in need, and simultaneously ensure social sustainability. A wider debate on humanitarian aid relations, within the social sustainability context, should also be conducted, to advance theories in both scientific fields, but also from the perspective of the practical implications of the mutual understanding of shared humanitarian and social sustainability challenges.

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