

NGOs in the Transnational Development Network: Exploring Relational Resources in the Promotion of Food Security

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Programming decisions by international NGOs operating in the area of development are a function of both humanitarian and pragmatic concerns. Helping communities establish sustainable agricultural cooperatives to address problems of undernutrition, for example, motivates programs implemented by NGOs in the food security sector. But NGOs are strategic actors and must also be attentive to organizational imperatives in regard to funding. These concerns relate to donor preferences and the reality that aid projects must demonstrate tangible results. This paper examines the network of organizations responding to the needs of the one billion people worldwide who live in food insecure environments. We focus on the activities of 47 North America-based NGOs (both secular and religious) and a mix of 99 governmental and nongovernmental donors. We consider the extent to which both internal resources (finances, staff and volunteers) and external relations (social capital) enhance NGO effectiveness in reaching people in need. The study employs some descriptive techniques from Social Network Analysis (SNA) to illuminate the structural features of the food security network. We begin to identify the network characteristics and NGO attributes that best explain success in promoting of food security and draw some tentative conclusions about the balance of internal and external resources employed in combatting global hunger.

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Introduction: NGOs in World Politics

Nongovernmental Organizations are important actors in global politics. As international actors, they challenge traditional conceptions of power in international relations theory. International NGOs respond to global emergencies where states are unable or unwilling to act, sometimes changing the policy decisions of states. Together, they propel the emergence of new norms in an age of interdependence among states. Currently, NGOs are key actors responding to global crises including climate change, poverty and hunger, the AIDS epidemic, and catastrophic natural disasters including multiple tsunamis and earthquakes. It is an understatement to say that these organizations are essential to global governance, adding to global society's capacity to respond to natural and human-made emergencies. NGOs play many roles in international politics; they are policy activists, public educators, agenda-setters, monitors, project implementers and watchdogs (e.g., Spiro 1995). The variety of roles they play highlights their unique position in the governance system as catalyst of change. Understanding how and why NGOs matter means taking a nuanced view of the international system whereby NGOs are among the many players facing constraints and opportunities to effect change in countries suffering and recovering from conflict, catastrophes, and poverty.

The global NGO sector has grown rapidly since the end of World War II, and exponentially since the end of the Cold War.¹ Most of these organizations are located in North America and Europe, although a few large INGOs are located in Africa². There are rival hypotheses regarding why this increase has evolved, however, most scholars argue that it is due to a declining state

¹ There are roughly 45,674 international NGOs (see Ahmed and Potter 2006; Boli and Thomas 1999; UIA statistics).

² Africare is one example of a large SNGO.

structure, moving towards a multipolar world (Willetts 2001; Lee 2006; Economist 1999; Mathews 1997; Risse-Kappen 1995). The supposed decline makes room for nonstate actors to participate in traditionally state-centered activities, such as security and economic development. Some argue the rise is partly due to globalization and our ability to communicate and travel across borders with ease (Singer 2002; Rosenau 1980). Others believe that increased affluence and professionalization are responsible. Turner (2010), for example, finds a correlation between the number of advanced degrees awarded worldwide and the number of INGOs. Salamon (2006) argues that INGO growth is due to three factors: the global communication revolution, the retreat of the nation-state and economic growth or affluence.

A more powerful explanation relates to the international institutional structures developed to support NGO participation. This argument suggests that with the formation of the League of Nations after World War I, nongovernmental participation was encouraged, setting the stage for future development of the NGO community. When the United Nations picked where the League left off, NGOs found a permanent home in an institutional structure theretofore dominated by states and intergovernmental organizations (IGOs). During the drafting of the UN charter, NGOs were invited to participate and were instrumental in formulating the preamble. Subsequently, the UN, through the Economic and Social Council (ECOSOC), created an NGO branch institutionalizing the partnership. The NGO charter, under Article 71, entitles NGOs to act as consultants to the UN on a variety of policy issues (Spiro 1995). Currently, over one thousand NGOs have consultative status, which is far greater than the ninety participating in 1949.

Additionally, government support for NGOs grew during the 1970s and 1980s. In 1973, the U.S. Congress mandated a “new direction” for development and switched to supporting NGOs directly, rather than through large bureaucratic aid agencies. NGOs, the Congress believed, were in a better position to reach the poorest of the poor worldwide. The 1980s were coined the

“development decade” and NGOs seemed to become a favored partner of governments. The transition was reflected in the levels of official development assistance (ODA) to NGOs, which grew from \$1 billion in 1970 to \$7 billion in 1990 (Ahmed and Potter 2006).³ Additional resources created opportunities for NGOs to participate more broadly and influence global culture.

The rise of NGOs and their partnerships with states and IGOs has created momentum for the expansion of a global civil society characterized by a variety of horizontal relationships alongside vertical power structures. Global civil society gives rise to collective action by groups whose activities are held together by common purposes. Global civil society is said to be located outside the state, but above individual nonstate actors. Keck and Sikkink (1998) take the idea further and suggest that the linkages among these actors in world politics form networks. Their concept of transnational advocacy networks suggests that NGOs and their interactions fall somewhere between civil society, domestic governments, and international organization. Here, the unique interplay between communities, governments, and international NGOs forms a unique organization form, with actors working in both collaboration and competition to address such issues as global hunger.

The next section is a general discussion of the role that NGOs play in the food security network and the special challenges they face as organizations and international actors with humanitarian purposes. The two sections that follow address questions such as what it takes to thrive in this political and organizational environment, what it means to be influential, and the sorts of internal and external resources NGOs have at their disposal to carry out their missions. The second part of the paper presents some initial analyses of data we are compiling on the food security network. We discuss issues relating to the operationalization of links between and among the primary nodes in this network, international NGOs and donors, and present some findings highlighting the most prominent of these network actors. We also offer some preliminary results on

³ “In 1992, NGOs provided \$8.3 billion in aid to developing countries, representing 13 percent of development assistance worldwide. Securing government action is no longer always necessary to the bottom line” (Spiro 1995, p. 4).

the predictors of NGOs' food aid activities and reach, including the relative importance of their material resources and social capital.

The Food Security Network

There are one billion hungry people in the world, 90 percent of whom are chronically hungry and malnourished. This is more than the population of the United States, Canada, and the EU combined (The Hunger Project 2011). Currently, 35 million people live with HIV/AIDS worldwide—not even half the number affected by malnutrition. In addition, of the world's 1.4 billion poor, 75 percent live in rural areas and are dependent on agriculture and related activities (FAO Report 2010). Currently, Millennium Development Goal (MDG) number 1 is to reduce global poverty and hunger, illustrating the prominence of the issue and the necessity of a structured response.

Policy decisions regarding global hunger have oscillated between state-centric models and humanitarian-centered approaches. In the United States, for example, cash assistance is generally not supported by donor agencies (see Public Law 480). Instead, food aid remains the traditional mechanism for addressing global hunger. This creates a self-interested, state-centric response to dispose of excess production in developing countries rather than focusing on local needs.

Development experts have long argued that addressing poverty and hunger requires developing sustainable solutions and markets for local production. Simply providing long-term food aid does little to alleviate pain and suffering long term. Humanitarian responses, however, assist in the development of local mechanisms to systematically reduce malnutrition. These projects tend to focus on developing sustainable agricultural systems, strengthening local markets and building capacity. Although projects focused on development and humanitarianism receive greater praise, they often require seeking funding from donor agencies outside the United States, or the ability to generate private resources.

The community involved in the fight against hunger is complex. The main actors are NGOs, although the NGO community in the food security sector is characterized by a high degree of inequality in resource possession and effectiveness (Duffield 1990). The connections they share, however, interject optimism into the development debate. “[T]he epistemic networks and operational linkages between NGOs, which bind practitioners and shape the humanitarian agenda irrespective of individual mandates, donors and governance, may hold the most potential for building bridges across the community’s divisions” (Stoddard 2003: 4).

International NGOs often operate within a flat international social structure. Communication patterns and linkages between NGOs and other actors (donors, other NGOs, and local partners) becomes important to the effective implementation of aid projects. The NGO network in the 1980s and 1990s was primarily comprised of larger international NGOs based in northern states (often referred to as NNGOs) and donors. Recently, with the push towards empowerment and sustainable development in the global south, the network has grown to include more local NGOs (also referred to as SNGOs in the literature). Together, these three sets of actors (NNGOs, SNGOs and donors) work in close connection to establish priorities, develop programmatic responses to global problems, and share resources. The NGO chain, presented in Figure 1, illustrates how NGOs are connected to other actors in any given policy domain. The figure illustrates that funding is transferred through donors and governments to two-tiers of NGOs, both NNGOs and SNGOs. Generally, NGOs act as mediators between the donors and beneficiaries, but NGOs are often themselves donors.

[Figure 1 about here]

In the food security network, NGOs operate in an environment of collaborative interaction and connectivity. The presence of donors in this network, however, makes NGO collaboration and partnership essential for survival. NGOs that are relatively isolated from the donor community tend

to become weak competitors against already strong NGO-donor alliances. Donors tend to fund projects with NGOs that have developed strong relations with the agencies and work in locations targeted by donors. Thus, from an organizational survival standpoint, NGOs need to collaborate to survive. The literature also suggests that collaborated responses produce greater results for beneficiaries, enabling NGOs to remain mission-driven while building inter-organizational relationships that further expand their reach (Sabatier 2007; Yanacopulos 2005; Florini 2000; Keck and Sikkink 1998; Sikkink 1993; Nelson 1997; Heclo 1972).

NGO interaction takes different forms. For example, NGOs collaborate on funding proposals, establish best practices, and assist each other in providing housing and protection in the field. Food security projects are themselves co-dependent (Pinstrup-Andersen 1999). When NGOs work in the same country and cooperate with the same donors, they are connected intimately in the field. The response to food security issues requires collaborated efforts, such as simultaneously addressing food insecurity alongside HIV/AIDS, access to clean water, the development of sanitation infrastructure, and educating the community on all of the aforementioned. NGOs in the field tend to collaborate efforts based on their collective comparative advantage. Their interventions, then, tend to be connected. The collaborated efforts suggest that NGOs operating in the same country, under the same donor, have programmatic connections.

Across all sectors, INGOs have formed partnerships, such as LINGOS (Learning in NGOs) and InterAction, which encourage inter-organizational collaboration and information sharing. Madon (1999) argues that international NGOs are key to the information and knowledge sharing processes that lead to global policy change. She posits that changing from operational and service delivery to advocacy requires a greater ability to learn, which is strengthened by international institutional ties. Learning, in turn, facilitates better relationships with donors and better measures of accountability.

The unique challenge of operating in tumultuous environments with limited resources drives a cultural adaptation of a network structure. When NGOs operate as a network, they communicate frequently, in the field and through national headquarters, share human and capital resources, and initiate programs based on comparative advantage. Stoddard (2003) observes that while large NGOs operate programs in multiple sectors, most NGOs in fact have particular operational niches—for example, CARE (food security), Médecins Sans Frontières (health), and Oxfam (sanitation)—or, like Save the Children, direct their programs at particular classes of beneficiaries. Therefore, isolating and examining specific sectors within the global NGO community may yield insights about prominent actors and their relationships, the composition of which is likely to vary. In sum, NGOs have often become mutually dependent. As modern emergencies increase and the scale of demands rises, NGOs must coordinate their limited capacities to effectively respond. Generally NGOs lack the breadth or technical expertise and capital resources to launch responses in isolation. Considering the co-dependence between and among INGOs an examination into their work without considering the network structure within which they operate is incomplete.

In most sectors, including those pertinent to food security, resources are scarce. Resource allocation decisions are rarely driven by objective assessments of need alone, but are also greatly influenced by proximity to the problem as well as ideological and political concerns. State interests and government donors are likely to set the agenda, while international and local NGOs implement programs that are closest to the communities they serve. Because power asymmetries exist within the NGO community, and these are reflected in their relationships with donors and other NGOs, examination of their interactions will shed light on the structure of the food security network. Ohanyan (2009: 498) argues “NGOs vary widely in their influence over global policy outcomes, and that influence is contingent on an NGO’s external network environment. Moreover, NGO autonomy is sensitive to the network structure in which the NGO operates rather than the financial

or organizational resources of the donors funding the NGO, as commonly believed in the literature.” A network analytic approach can illustrate which NGOs act as general conduits of information and to what extent local NGOs are integrated into the response, suggesting possible avenues to simplify connections, reduce transaction costs, and improve food security programming globally.

Power and Survival in the Food Security Network

To be a powerful actor in the food security network means more than the possession of financial resources and personnel. To be sure, such resources are important to NGOs. For example, CARE is one of the largest NGOs in the United States, operating with budget and staff numbers that far exceed many other organizations, such as Africare, Concern Worldwide, and Food for the Hungry. But some NGOs that lack these material resources have managed to become prominent in the food security network, and effective in carrying out their missions, by virtue of the relationships they develop with other NGOs at both the international and local levels. Catholic Relief Services, for example, has built strategic partnerships with World Vision and CARE to expand their reach and deliver food packages to insecure environments they might not otherwise be able to reach. In addition, CRS is not solely reliant on short-term contracts from state donors. Due to their religious affiliation, they are able to diversify funds by reaching out to Catholic dioceses in the United States and Europe.

We expect that material resources do, to some extent, go hand-in-hand with the development of ties among NGOs and donors, and that those ties, in turn, generate opportunities for accessing additional resources. However, there is also reason to believe that some actors, poor in material resources, are able to make up for these disadvantages in carrying out their missions by relying more heavily on relationships they have built over time with other actors in the food security

network—that is, their social capital (Boli and Thomas 1999; Putnam 2000; Florini 2000; Salamon 2000). “NGOs live in a world where financial capital is highly dependent on social capital—the reputation of an organization is directly related to its ability to raise funds from governments and individuals” (Salm 1999: 95).

Both internal capacity (financing, staff, and volunteers) and external capacity (collaborations with other NGOs, local partners, and donors) are essential to an NGO’s effectiveness and longevity in the food security sector. NGOs need to balance external cooperation and coordination with the internal imperatives of organizational survival and growth. NGOs have developed strategies for both organizational capacity-building and the development of external relations.

NGOs need to diversify funds. They also must deal with human resource shortages, and therefore are constantly engaged in recruiting and retaining a highly skilled workforce. They must direct resources to fundraising activities, which comes at some cost to assets available to implement their assistance programs. Externally, they need to collaborate with other NGOs while at the same time competing with them to secure scarce funding. NGOs also strive to maintain their autonomy, balancing demands from donors against their own philosophies and experiences concerning what works best in the field and what promotes the health of the organization itself. Managing both internal and external relations can lead to competing initiatives to scale up and scale out; they must decide when to use resources to build up internal capacity and when to collaborate and build network capacity. A thriving organization strikes a balance between external coordination and internal capacity building.

Developing Internal Capacity and External Coordination

There is a limited, yet compelling body of literature that supports the claim that NGO leaders need distinct skills and competencies, different from other for-profit and government organizations

(Smillie 1995; Fowler 1997; Eade 2000; Lewis 2001; Smillie and Hailey 2001; Edwards and Fowler 2002; Hailey and James 2004; James et al. 2005). In addition, management and leadership personnel have been increasingly difficult to recruit and retain. International NGOs, as a consequence, suffer from a whole slew of human resource difficulties relating to the recruitment and retention of talented staff, the availability of competitive pay and benefits, and the creation of an organizational culture that fosters professional development and advancement opportunities (Salamon 2003).

The literature suggests that there is great concern within the NGO community regarding the lack of qualified applicants available for senior leadership roles. The pool of candidates suitable for promotion from within is limited. Nor is it easy to transition candidates with relevant experience and talent from outside the sector into NGO leadership positions, given these organizations' unique attributes and the challenges they face. "It is estimated that in the United States alone over half a million new senior managers will have to be developed for leadership positions in the period of 2007-2016" (Hailey 2006: 8; see also CIVICUS 2002).

One of the most prevalent factors affecting NGOs' ability to retain quality leaders, especially in senior positions, is the environment within which leaders must live and work (Fowler 1997; Smillie and Hailey 2001; Hailey 2006). Research on social identity theory suggests that the way leaders act is directly related to how they see their role in relation to the group; however, "most studies of leadership are divorced from the broader social context within which these roles and qualities emerge" (Haslam 2001: 58). An increasing number of NGO leaders are working in trying social situations. Their personal vision in relation to the communities in which they work affects their psychological well-being and leadership style. For example, long periods of work in and around communities affected by starvation is associated with high rates of employee burnout and resignations (Hailey and James 2004; James 2005).

International NGOs are also notorious for offering limited opportunities for personnel

advancement and development. Human resource development is dependent not only on the retention of competent staff, but also on the organization's internal capacity to develop such individuals. Lack of leadership positions in an organization can limit development opportunities, especially in smaller nonprofit organizations (Jiang 2008). In larger NGOs, such as Save the Children and Oxfam, these challenges are easier to confront because there are more opportunities for mobility within the organization. Some report that turnover within the NGO community is at an all-time high due in no small part to a dearth of opportunities for professional advancement (Salamon 2003; Hailey 2006).

The challenges of staff recruitment and retention, and the consequent push to build internal capacity compete with the organization's imperative to dedicate resources to fundraising and programming. These and other demands on NGO resources lead to more donor dependency and encourages increased partnerships within the NGO community—international and local, northern and southern—in an effort to pool and leverage limited capacities. The food security network has become more complex as a result, and navigating this terrain requires that more staff and other resources be dedicated to coordination and relationship building. When successful, the NGO's ability to reach its beneficiaries is improved. When not, the effort can further diminish the organizations internal capacity and undermine its humanitarian mission.

Developing external capacity means building effective donor relationships and creating working relationships with other NGOs. Evidence suggests that tightly run capital campaigns and collaborative NGO networks have a greater impact on both external funding and effective advocacy. The anti-landmine campaign is an example of NGOs forming a purposive international network and ultimately influencing the policy agenda of a majority of states and key IGOs. This network developed as a result of strategic relationships between and among international and local NGOs.

Yanacopulos (2005) argues that resource dependent NGOs develop preferences for three

strategies: coalition building, tactical lobbying, and coordinated campaigning. Nelson (1996) also argues that coalitions form the basis for exerting influence over donors. NGOs face a greater push to use partnerships, as the southern or less developed countries fight for a voice in their own development (Salm 1999). However, where more coordinated effort and partnerships can lead to pooled resources and greater reach, it can also lead to irrelevance or loss of autonomy, whereby NGOs begin to experience countervailing imperatives, resist cooperation, and strike more competitive postures. In different situational contexts, NGOs must balance the need to cooperate with the need to maintain internal capacity and remain relevant within the food security network.

NGO success also depends on relationships with donors in the network. As Ohanyan (2009: 476) states, “the inherent richness of the interplay between NGOs and their donors mediates the linkage between power differentials and policy outcomes.” Studies have pointed to the frequency of complicated, often paternalistic relationships between donors and NGOs (Keck and Sikkink 1998; Edwards 1999; Mendelson and Glenn 2002; Nelson 1997). Relationships that form between donors and NGOs are of three main types: patron-client, as representative-constituent, and principal-agent (Ahmed and Potter 2006: 108-110; Jordan 2000). Each of these relationships is, in its own way, asymmetric (Madon 1999). As NGOs face resource scarcity, they are vulnerable to donor demands and priorities. Even when they operate under a representative and constituent relationship, the NGO represents the interests of the donor through acceptance of funds. Currently, CARE and Save the Children have budgets with over fifty percent government short-term contracts.

NGOs have expanded organizational capacities to make the best of these relationships, although their humanitarian missions have not always been well served. Madon (1999), for example, posits that there are costs to NGOs behaving like “public service” contractors in their effort to adopt the proper mixture of assets in the service of both humanitarianism and pragmatism. As NGOs begin servicing state needs and developing an uneven balance of ODA and private funds,

they weaken their ability to assess situations on the ground and make need-based decisions to allocate resources. NGOs like Mercy Corps, which operate in food insecure environments such as Somalia, are at the mercy of donor agencies. Most donor agencies have allocated limited resources to Somalia despite the growing levels of malnutrition and starvation, leaving the NGOs who operate there little room to develop programs that address the actual needs. Instead, NGOs that are highly dependent on donor agency funds may choose to service the perceived needs of the bureaucrats rather than the perceived needs of the food insecure.

Moreover, NGOs acting as public service contractors become open to scrutiny. The purpose of NGO activity was initially to act where governments could not or would not. Servicing government grants, however, leads NGOs back to being less apolitical and less able to challenge states on areas of food security programming. Cooley and Ron (2002: 13) state that “when an organization’s survival depends on making strategic choices in a market environment characterized by uncertainty, its interests will be shaped, often unintentionally, by material incentives.” Thus, when NGOs become public service contractors they are likely to accept perverse incentives to secure survival.

Network Data Analysis

The data analysis presented in this section is largely descriptive and derives from a larger project just getting underway on humanitarian assistance by international and local NGOs supported by a variety of both state and nonstate donors. Thus, conceptually, the humanitarian networks we examine comprise two types of actors: NGOs and donors. Subsequent work will disaggregate the NGO category into international and local NGOs, but for now we limit ourselves to an examination of INGOs. Further, the initial stage of data collection, and this paper, is focused on the food security sector. The data we compile come primarily from two locations. InterAction is an

association of U.S.-based INGOs and maintains a website that includes, among other information, “aid maps” showing the geographic distribution of aid projects; we consulted the Food Security Aid Map (see foodsecurity.ngoaidmap.org). From information attached to this map, we collected data on 979 food aid projects, involving 47 secular and religious INGOs and 99 donors. The donors are government agencies, foundations, private corporations, and NGOs themselves. Our other primary data source is GuideStar, which provides financial and other statistics on nonprofit organizations; we discuss this information below.

Measuring Network Links

To analyze these data, we employ various descriptive methods from social network analysis (SNA). At its most inclusive, the food security network we study consists of 146 nodes, both INGOs and donors, although we also look at subsets of just INGOs and just donors. We have experimented with operationalizing the links between these nodes in various ways. Links between donors and INGOs are most straightforward: a link exists between two nodes if the donor has funded one or more projects implemented by the INGO. Links between INGOs and between donors are more problematic. Ideally, in the case of INGOs, a link between two INGOs would exist if the two are working together in the field on a common aid project, but our data at this stage do not allow us to discern this. INGOs use unique project names for their activities, which do not match the project names used by other INGOs even when they are working closely in the field. The question becomes which alternative, indirect measures best proxy the sorts of direct working relationships we are interested in examining.

Almost by definition, INGOs that work together in the field work in the same sector, each of which has a food security dimension: agriculture; disaster management; economic recovery and development; education; environment; food aid; health; human rights, democracy, and governance;

peace and security; protection; shelter and housing; water, sanitation, and hygiene. We suspect that an operational measure that posits a link between two INGOs based on their work within the same sector will overestimate the extent of working ties within the INGO community. We cannot show this until we have data on direct ties, but the density of the INGO network (i.e., excluding donors) when links are operationalized in this way is unrealistically high. In a network with s nodes, the maximum number of directed ties between them is $s(s - 1)$; half that if the ties are undirected. The density of same-sector (undirected) links in the INGO network, that is, the proportion of all possible ties present, is 0.93.

When we operationalize links as existing when two INGOs work in at least one country in common, network density is 0.57; when the INGOs are funded by a common donor, 0.20. Our hunch is that the best proxy for INGO-INGO ties is a combination of these latter two measures: a link exists if the INGOs are funded by a common donor and work in a common country. In this case, network density is 0.15 and Figure 2 shows the corresponding “sociogram.” InterAction provides information on project location at the subnational level as well, and further refinement of the geographic element of our proxy indicator is possible. Ultimately, however, we should prefer a direct measure of INGO-INGO ties.

[Figure 2 about here]

Ascertaining ties between donors in the absence of direct indicators is no less difficult. Proceeding with an approach similar to that just described, the alternative proxies each yield donor network densities considerable lower than observed in the INGO networks, although this is partly an artifact of the larger number of donor nodes and possible links among them. When donor ties are operationalized as existing if two donors fund projects in at least one country in common, density is 0.13; when they fund at least one INGO in common, 0.12; and when they do both in common, 0.03. As with INGOs, we suggest that this last, compound measure of donor-donor ties is best and least

likely to overestimate actual relationships between donors. But, again, and perhaps even more so than in the case of INGOs, we think it important to develop a direct measure of these relationships. Figure 3 shows this donor sociogram. Figure 4 shows the sociogram of the full food security network—INGOs and donors, with ties between and among them—although visual inspection of this figure is unlikely to give more than very general impression of the structural complexity that needs to be examined.

[Figures 3 and 4 about here]

Material Resources and Social Capital

In addition to structural properties of the food security network, like density, we are interested in properties of actors, both INGOs and donors, which derive from their positions and connectivity within the network. Above we discussed the difference between INGOs material resources, like financing and personnel, and their social capital, which derives from their relationships with other actors in the network. SNA includes various techniques for measuring the prominence of network nodes and their strategic positioning relative to other nodes and groupings.

Social network data are arranged as a square “sociomatrix” in which there is both a row and a column for each node in the network. A cell in the matrix contains a 1 if the actor represented by row i , designated n_i , had a relationship with the actor represented by column j , designated n_j , in which case $x_{ij} = 1$; otherwise $x_{ij} = 0$. Some of our data are nondirectional in that a tie between two nodes represents a conjectured relationship rather than a sent or received communication or other exchange; thus, $x_{ij} = x_{ji}$. But in subsequent research on, for example, ties connecting donors and INGOs, it may be useful to consider directional ties. In this case, an actor’s *outdegree*, $d(n_i)$, is the number of other actors to whom that actor has directed some form of communication or exchange

(for example, funding); *indegree*, $d(n_j)$, is the number of actors from whom a communication or exchange has been received. That is,

$$d(n_i) = \sum_{\forall j \neq i} x_{ij} \text{ and } d(n_j) = \sum_{\forall i \neq j} x_{ji}, \quad (1)$$

which are, respectively, the row i and column j totals of the sociomatrix.

In most social networks, certain actors are more prominent than others and the evidence of their prominence is often the number and type of social ties they maintain with other actors. The *centrality* of a network actor is sometimes indexed as its outdegree or indegree (or both), but since these measures are greatly affected by the number of actors in a network, it is useful to normalize the index. Thus, the normalized outdegree and indegree centrality indexes can be computed as

$$C'_D(n_i) = \frac{\sum_{\forall j \neq i} x_{ij}}{s-1} \text{ and } C'_D(n_j) = \frac{\sum_{\forall i \neq j} x_{ji}}{s-1}. \quad (2)$$

Again, because the data we use for this analysis are nondirectional—the sociomatrix is symmetric—the formulas in (2) give the same result. Figure 5 arranges INGOs so that those with the highest degree centralities are positioned nearer the center of ten concentric rings, while those with lower scores are positioned nearer the periphery. Catholic Relief Services and World Vision, both religious organizations, are the most prominent INGOs in the social network according to this measure, followed by Food for the Hungry, International Medical Corps, Mercy Corps, Winrock International, and Save the Children, all secular.

[Figure 5 about here]

Are these INGOs, with potentially high levels of social capital, also organizations with the greatest material resources at their disposal? GuideStar, a provider of information on U.S.-based nonprofits, reports various statistics taken from IRS Forms 990, which are filed by tax-exempt

organizations (see www.guidestar.org). For each of the INGOs examined here, we have collected data on net revenue, number of employees, and number of volunteers. Some of the same INGOs with high centrality measures—Catholic Relief Services, Save the Children, and Mercy Corps—are also among the top ten in terms of revenue and employees, but the others rank below this in one or both measures of material resources. Indeed, overall, there is a low correlation between INGOs' degree centrality and their revenue ($r = 0.12$), employees ($r = 0.07$), and volunteers ($r = -0.14$). In an Ordinary Least Squares (OLS) regression of degree centrality on revenue, employees, and the number of aid projects undertaken by the INGO, the model explains only 11 percent of the variance in centrality. Thus, these measures of material and social capital are tapping distinct attributes of these actors, with possibly different implications for the influence and efficacy in the food security network.

Predicting Reach

If these material and social measures are highlighting different dimension of potential importance and influence within the aid network, the question arises whether we can differentiate their relative impact on INGOs' delivery of benefits to their constituency, those living in the shadow of food insecurity. What factors predict the number of aid projects that these INGOs undertake? What factors predict the number of people they reach? Causality will be difficult to disentangle in any effort to answer these questions. INGO fundraising efforts with donors often are pitched with specific projects in mind and specific needy populations, in which case (desired) outcomes are “causes” of revenue flows and human resource acquisition. The same may be said about INGO partnerships, which we have proposed is a source of social capital: existing partnerships are likely to be enhanced and new partnerships initiated in response to anticipated projects and unanticipated need. Although such issues of causality will be addressed in the course of our ongoing research, for

now we set them aside and simply offer some preliminary findings on material and social capacity as predictors of INGO reach.

In addition to the data discussed above, InterAction also reports estimates of the number of people reached by each of the 979 food aid projects that we use to construct our network dataset, which we have summed for each of the 47 INGOs in the network. Table 1 shows some descriptive statistics for this variable and others, including degree centrality. Clearly, the INGO community active in food security activities displays a wide range of capacities. While Catholic Relief Services is the most central actor in the network by our measure, the American Red Cross has both the largest revenue and the largest number of employees, and World Vision is involved in the most projects, which together reach the most people. Toward the other end of the spectrum on these measures are such organizations as Baptist World Alliance, Plant with Purpose, and African Medical and Research Corporation.

[Table 1 about here]

We use OLS regression to estimate the impact of INGO capacity on the number of projects they undertake and the number of people they reach. For projects, using millions of dollars in revenue, hundreds of employees, and degree centrality (rescaled from 1 to 10) as regressors, the estimating equation is:

$$Projects = 6.11 + 0.11(Revenue) - 1.09(Employees) + 7.35(Centrality) \quad (3)$$

(0.02) (0.23) (3.50)

Standard errors are shown in parentheses below the parameter estimates, all of which are statistically significant at the 0.05 level. The model explains 44 percent of the variance in INGO food security projects. An increase in ten million dollars in revenue is associated with an increase in one food aid project, while an increase in one hundred employees corresponds to a decrease in one project. The negative sign on the parameter estimate for employees seems counterintuitive, but the finding makes

more sense in the context of the model we report next. Most relevant for our purposes is that network centrality, our measure of an INGO's social capital, is positively associated with program participation. A one unit increase on the 1-10 centrality scale is associated with an increase in seven food security programs, controlling for material resources.

Regressing the total number of people reached by the INGO, in tens of thousands, on the same independent variables plus projects gives this estimating equation:

$$Reached = -148 + 1.56(Revenue) - 14.36(Employees) + 5.00(Projects) + 166(Centrality) \quad (4)$$

(0.33) (3.50) (1.90) (45)

All parameter estimates are statistically significant and the model explains 71 percent of the variance in number of people reached. The results generally conform to those for the model predicting projects. A one million dollar increase in revenue is associated with an increase in 15 thousand beneficiaries, while an increase in one project corresponds to 50 thousand more beneficiaries. Again we see a negative parameter estimate for the impact on increasing the number of employees: one hundred more employees means 140 thousand fewer people reached by the INGO. The negative sign suggests that, for a given level of revenue, a larger number of employees acts as a drag on resources and diminishes the organization's reach. (The magnitude of this estimated effect does seem implausibly high, however.) As with projects, the number of people reached increases with higher levels of INGO centrality: a one unit increase in centrality is associated with 1.7 million more beneficiaries. These organizations' social connectedness, not just their material resources, increases their reach.

Bringing Donors Back In

Our analysis in this paper has focused primarily on INGOs in the food security network, but we offer a couple observations about donors before concluding. Figure 4 above, a sociogram of both

INGOs and donors, was difficult to decipher, but the degree centrality map shown in Figure 6 allows us to observe the most prominent among both types of actors. The most central INGOs shown above—Catholic Relief Services, World Vision, Save the Children, Food for the Hungry, Mercy Corps—remain toward the middle of the chart, but their prominence exists alongside donors like USAID’s Office of Foreign Disaster Assistance, U.S. Department of Agriculture, and the European Commission’s Humanitarian Aid and Civil Protection unit, each of which are, of course, governmental donors. Among the more prominent nongovernmental donors are UNICEF and the Bill and Melinda Gates Foundation. But in general, as we have operationalized links between nodes, INGOs are more connected than donors.

[Figure 6 about here]

When we examine only the funding ties connecting donors to INGOs, a disproportionate number of these relationships are found among the handful of INGOs and donors that we have highlighted as the most central in the food security network. Many networks in physical, biological, and social systems have this sort of “scale-free” structure (Barabási and Albert 1999; Barabási and Bonabeau 2003). In contrast to random networks, in which links or social ties are distributed randomly across the nodes, scale-free networks consist of some nodes with large numbers of connections (network hubs), and many others with very few connections. For example, Barabási and associates have found that links to pages on the World Wide Web have a “power law” distribution:

$$P(k) \approx k^{-\gamma} \quad (5)$$

where $P(k)$ is the probability of a network node with k links; k is the number of links per node; and the exponent $-\gamma$ is a constant. Figure 7 plots the distribution of k -linked nodes in this network and shows the fitted curve for $\gamma = 1.43$, which explains 84 percent of the variance in the frequency distribution. We should not make too much of this finding, given the relatively few data points, but

it does suggest that the “preferential attachment” observed in many networks may also be present in this one—that is, in the form of preferential funding. This possibility we pursue in future research.

Conclusion

NGOs have formed humanitarian advocacy networks based on informal communication structures and frequent programmatic connections. The food security network we examine in this paper consists of 47 international NGOs and 99 donors and accounts for 979 assistance projects worldwide. The structural elements of this sector, with further study, can provide important information regarding collaboration and competition among international and local NGOs and the donors that fund their activities. We have examined the connectivity between INGOs and donors in an attempt to probe this food security network and these organizations’ efforts on behalf of the one billion people currently living in conditions of chronic hunger and malnutrition. The results of our analysis, while tentative, suggest that both internal and external resources are necessary to develop meaningful responses to the problem of global hunger, although further research is needed to shed light on the appropriate mixture most conducive to delivering results under different conditions and organizational contexts. Building internal capacities and deploying social capital are complementary strategies available to these actors and we need to better understand why some NGOs may have preferences for divergent organizational structures and partnership portfolios.

Given that NGOs are likely to remain prominent and important actors in global governance, these preliminary findings offer motivation to find better measures of their social relations and to test hypotheses concerning the effectiveness of food security and other humanitarian programs. The trajectory of this research depends on the quality of the data we are able to compile and the application of appropriate analytic methods. In subsequent research, we plan to expand our data collection, consider direct interactions between organizations, and disaggregate the NGO

community into both international and local actors in an effort to better understand the ways these entities can operate effectively in insecure environments with finite resources. Based on our initial research, we have reason to believe that some organizations prefer building external relations to scaling up internal capacities as a means of both serving their constituents and surviving as organizations in a complex social and political environment. We have also shown that NGO reach is related to both material capacity (revenue and staff) and the organization's centrality in the food security network. The implications of this and future research may provide insight into the funding schemes that some skeptics believe pervert humanitarian work.

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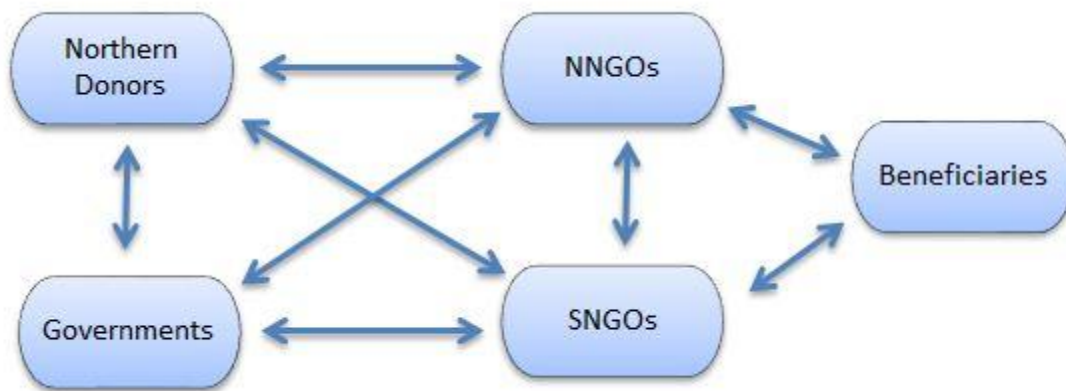


Figure 1: NGO Chain

Figure adapted from Ahmed and Potter (2006).

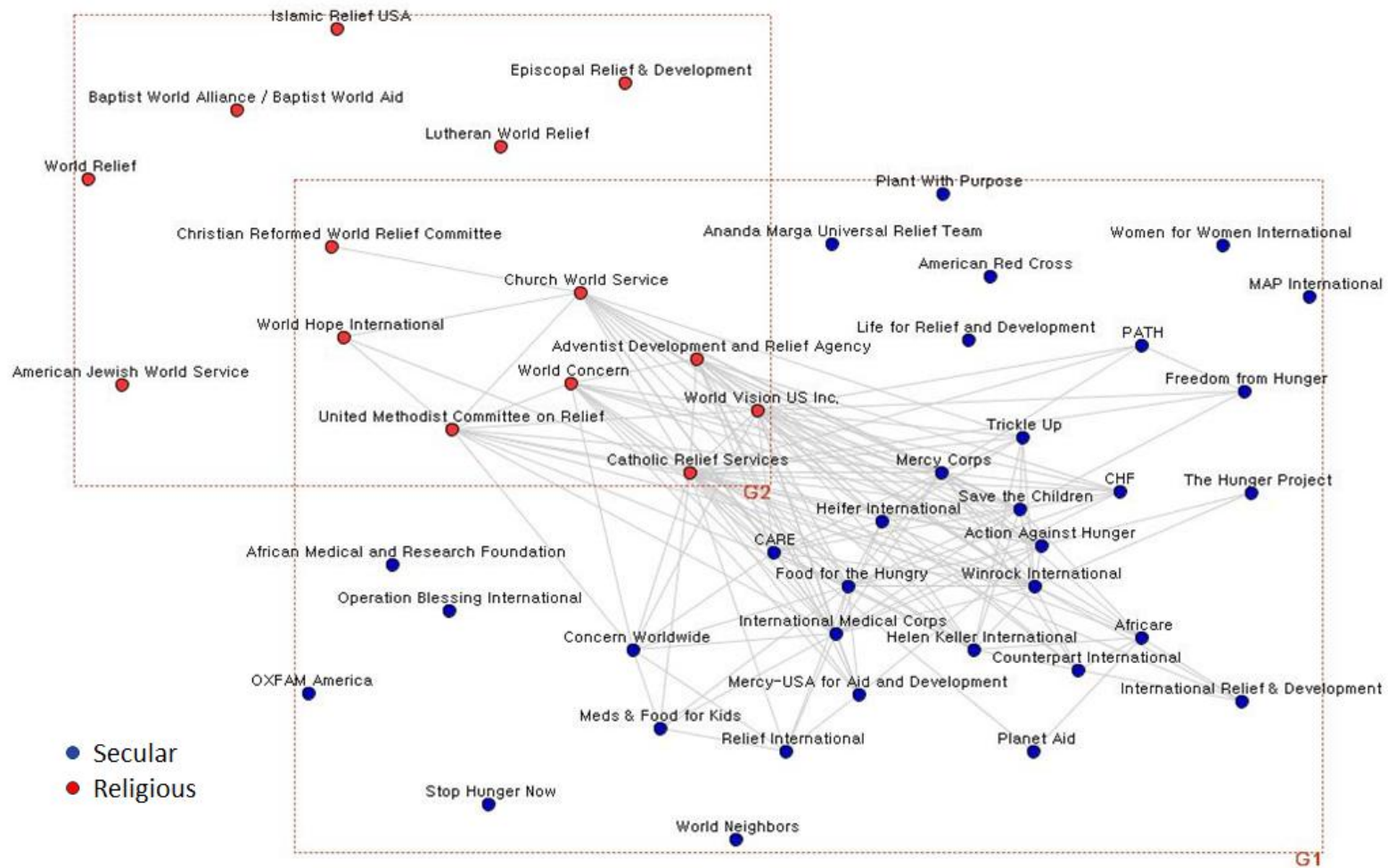


Figure 2: Food Security Network: International NGOs

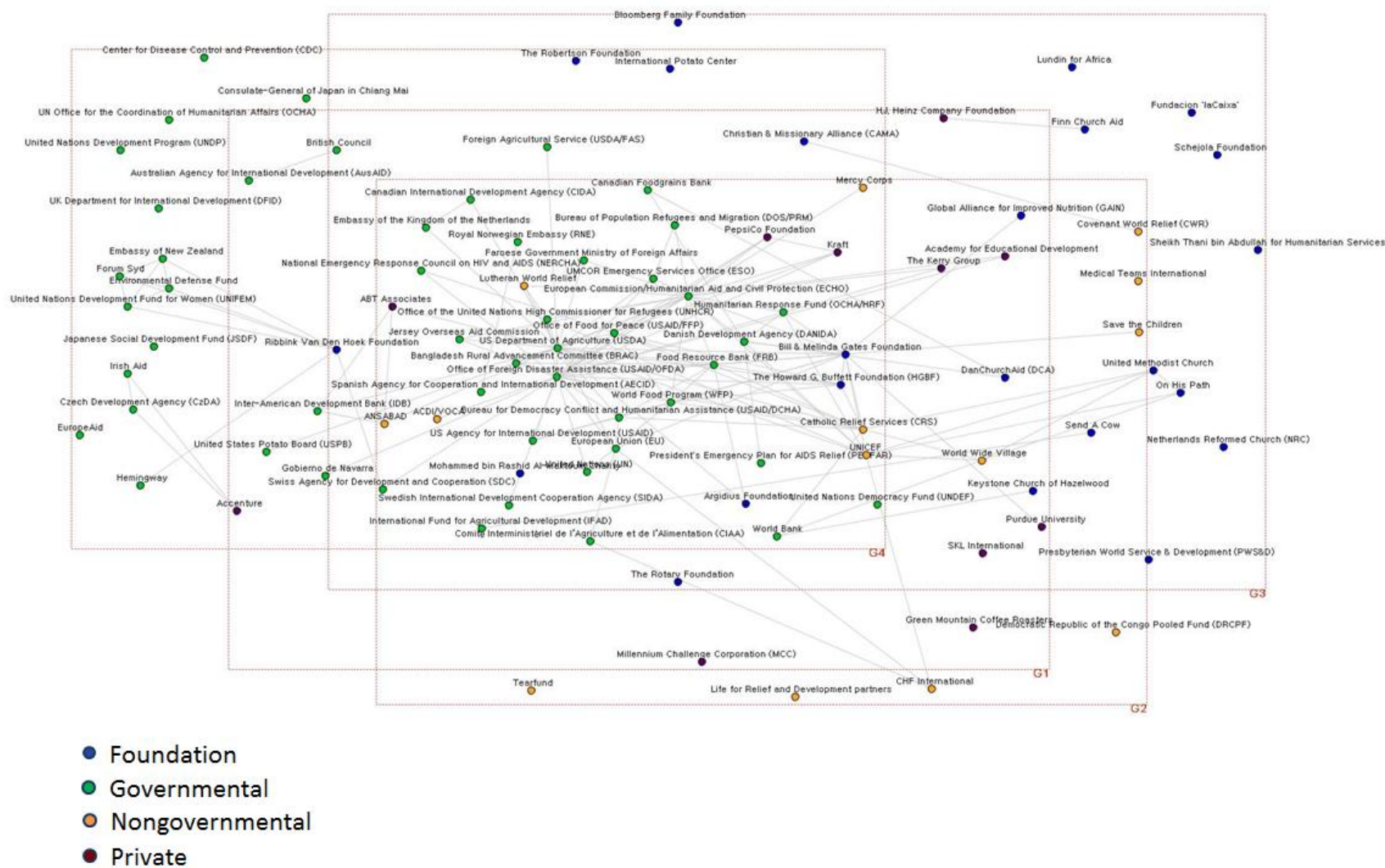


Figure 3: Food Security Network: Donors

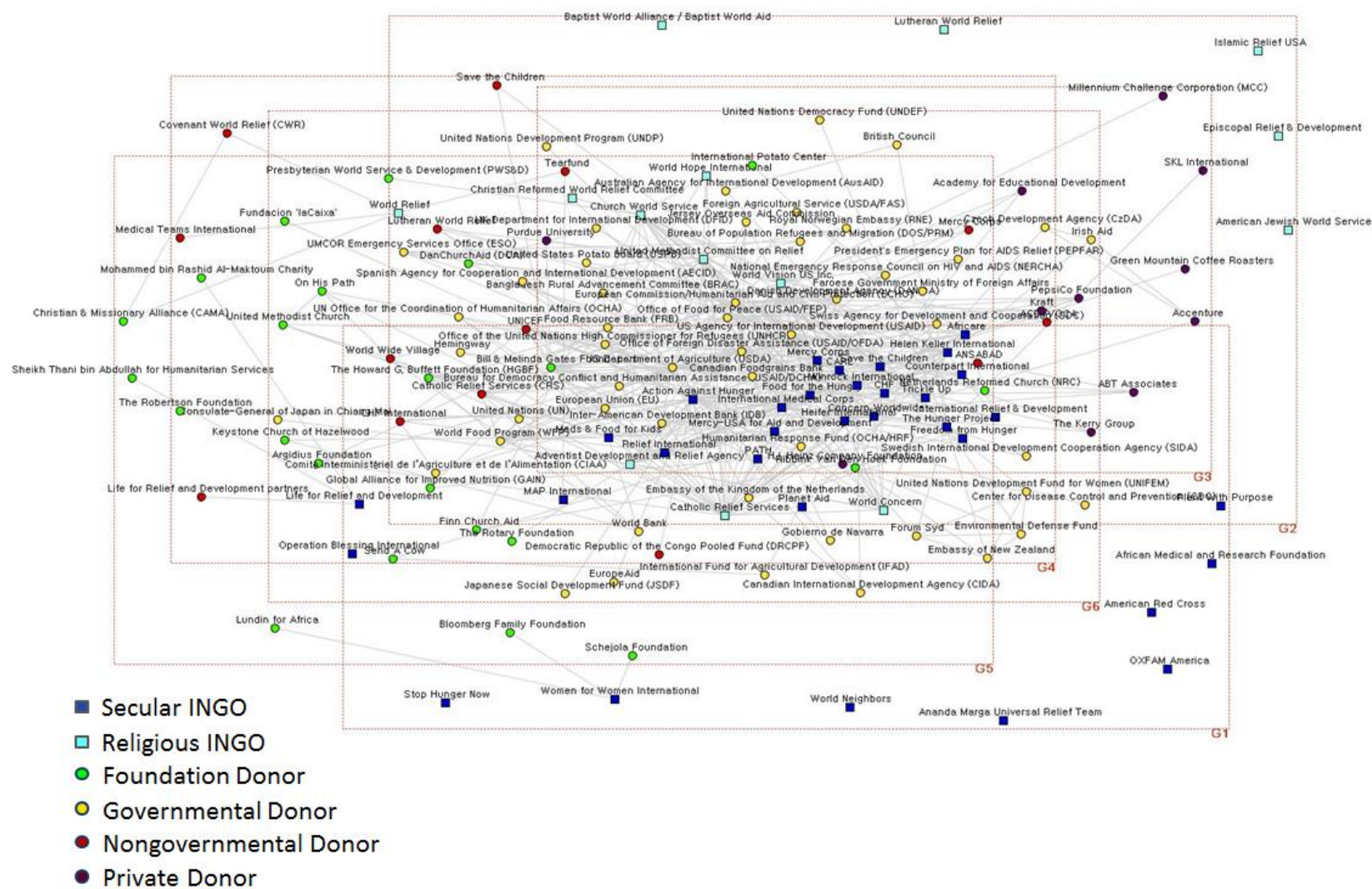


Figure 4: Food Security Network: INGOs and Donors

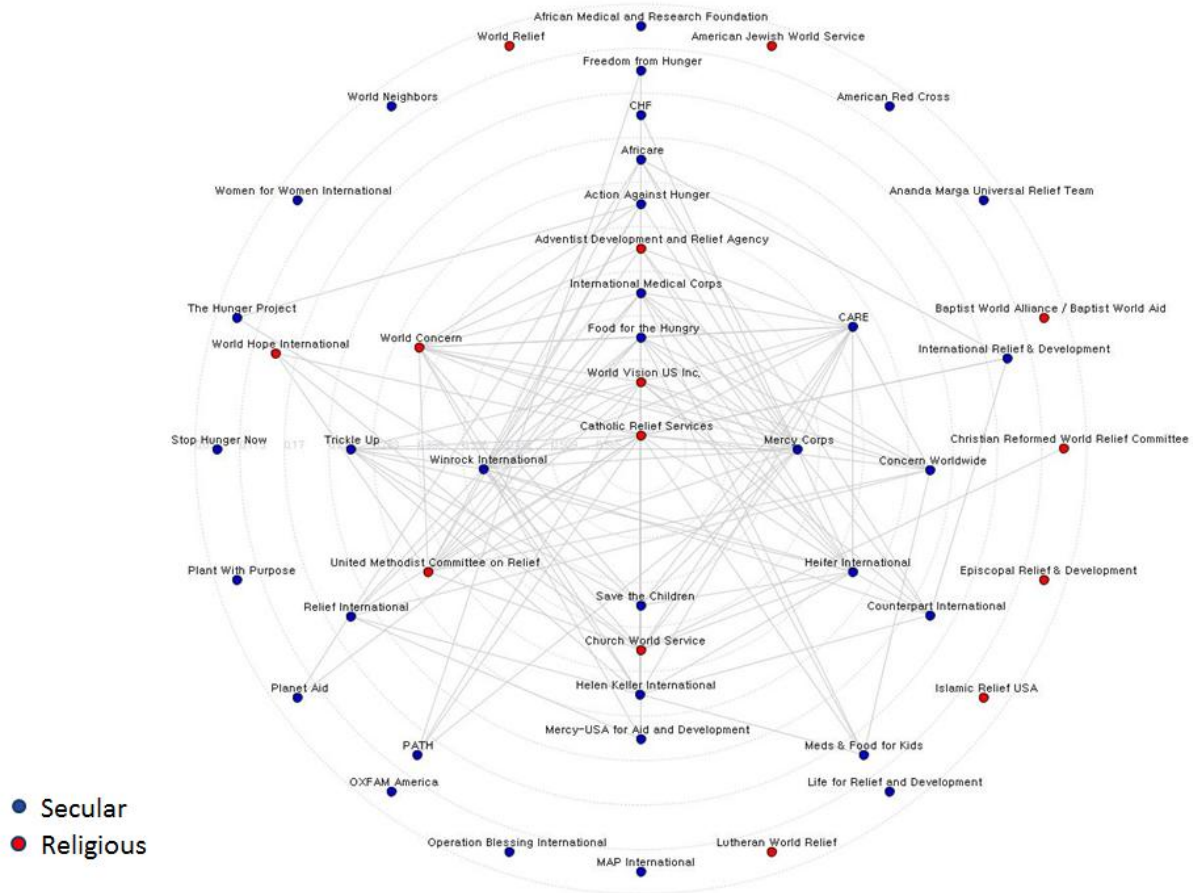


Figure 5: INGO Centrality: Common Donor and Country Ties

Table 1: Descriptive Statistics for INGO Capacity and Reach

	<i>mean</i>	<i>maximum</i>	<i>minimum</i>	<i>std. deviation</i>
revenue	218,152,654	3,587,775,430	360,928	570,622,301
employees	1,813	35,103	6	5,304
projects	21	280	1	48
reached	2,826,176	48,090,762	2,700	8,243,371
centrality	0.15	0.57	0.00	0.16

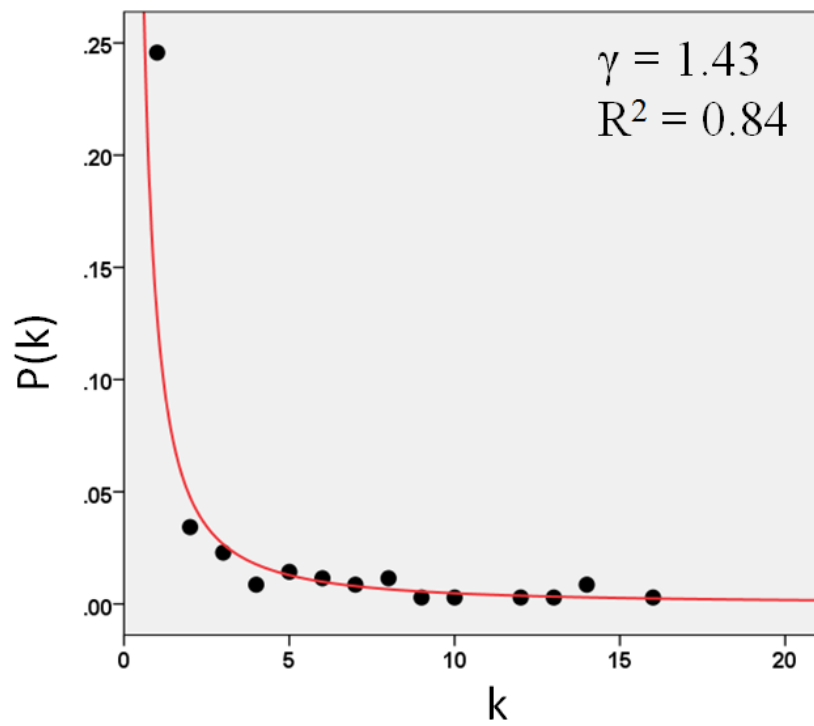


Figure 7: Distribution of Funding Tied in Food Security Network