

Info Note

Agricultural development networks in 14 research sites

Findings from the CCAFS Organizational Baseline Survey

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Key messages

- Food security and agricultural development require coordination from cross-scale public and private organizations that provide resources and support to smallholder farming communities.
- Based on network analysis of the data, we find three distinct types of agricultural development networks: highly centralized brokered networks, densely connected shared networks, and disjointed fragmented networks.
- Leadership roles vary within networks: the presence of external organizations, such as international NGOs, increase overall coordination and capacity building, but local organizations are the most well-connected actors.

This brief summarizes findings from a network analysis using data from the CCAFS Organizational Baseline Surveys (OBS) to analyze how organizations in CCAFS sites coordinate to work together on climate change and agriculture initiatives. The work was undertaken by a collaborative team of researchers at University of California Davis, University of Vermont, and CCAFS research staff. The study utilizes OBS data from 14 countries in West Africa, East Africa and South Asia and focuses on understanding the structures of partnership networks across different sites and what types of organizations fill specific roles in these networks (Figure 1).

Overview of the OBS Network Data

From 2010-2011, CCAFS research teams worked with local research partners in each of the following 14 study sites to collect data for the OBS:

- **East Africa:** Makueni and Nyando, Kenya; Rakai and Hoima, Uganda; Lushoto, Tanzania; Borana, Ethiopia;
- **West Africa:** Lawra-Jirapa, Ghana; Segou, Mali; Kollo, Niger; Kaffrine, Senegal;
- **South Asia:** Bagerhat, Bangladesh; Karnal and Vaishali, India; Rupandehi, Nepal.

Village focus groups in each site created a list of the most important organizations working on agriculture, food security and climate change in their region, including government entities, non-governmental organizations and private sector companies. Across all 14 sites, 145 organizations in total were nominated, and each of these were surveyed to gather information on what types of climate change, food security and agriculture projects they carried out and how they partnered with other organizations working on similar projects. We leverage this data on partnerships and use social network analysis to map how all of the organizations in a site are related and what types of organizations tend to act as central partners connecting everyone, versus organizations that are isolated and have few to no partnerships.

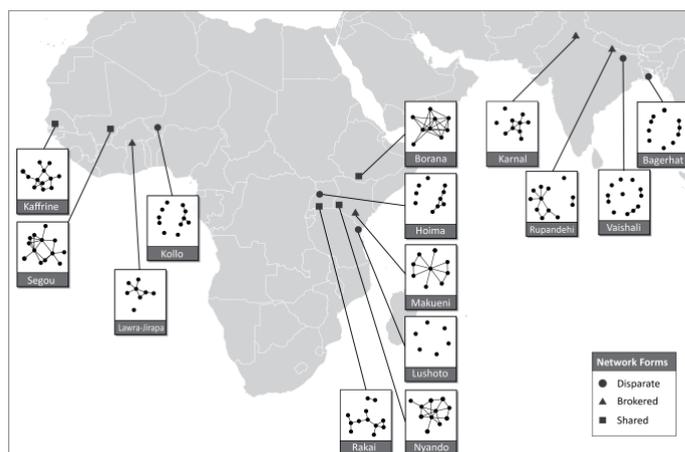
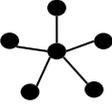
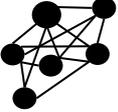
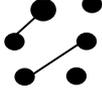


Figure 1. Map of OBS sites with organizational networks

What are agriculture development networks and why do they matter?

Collaborative governance efforts involving multiple state and non-state actors have grown in their importance for addressing complex social and economic development challenges. Understanding which actors are involved, what resources they bring into the collaborative network, and how they engage with one another are critical to understanding the potential for networks to be effective in solving the problem at hand. In the contexts of food security and agricultural adaptation to climate change, collaborative governance networks have gained attention for their potential to leverage social capital, motivate coordination in crisis-response periods, and build community resilience.

Organizational networks vary in their size, structure, connectivity and centralization. Generally, networks can be classified into the following broad types:

- Brokered networks:** highly centralized, hierarchical networks where a single actor sits between all, or nearly all, other actors, acting as a key partner in the majority of network activities. The central actor brokering these exchanges can be external to the community, or a lead organization that is embedded within the community.
 
- Shared networks:** decentralized networks with high density of connections between almost all of the organizations. Responsibility for network activities can be shared across many organizations, and there is no single organization coordinating everyone.
 
- Fragmented networks:** many isolated actors that have few to no partnerships with other organizations. These networks have relatively low coordination between the efforts led by organizations acting independently from one another.
 

These different network types may have different implications as to how climate change and agricultural development activities are carried out by the organizations in a site. Brokered networks, for instance, may reduce the costs of collaborative decision-making, implementing top-down decisions and enabling faster and more coordinated project implementation, which may be particularly important in crisis response times. However, brokered networks depend heavily on the capacity and intentions of the central actor, who has more political power than others. Shared networks, on the other hand, rely on many trust-based, reciprocal relationships that can help to emphasize local knowledge and practical experience. The distributed decision-making power in these networks, however, creates higher transaction costs to maintain all of the partnerships and can delay decisions and

implementation when all actors are required to be on board. Finally, fragmented networks may indicate an independence and autonomy among actors, potentially even signaling efficient distribution of responsibilities and activities. Conversely, the fragmentation and isolation may also signal a lack of coordination among actors or across initiatives, such that every organization is working separately and efforts have reduced efficacy due to lack of access to resources of information.

This research focuses on mapping the organizational networks that are present in the CCAFS sites and uses relevant characteristics to understand what network types actually exist in agricultural development contexts. Here, we do *not* assess the effectiveness of the different network types, rather we suggest it is an important first step to understand if and how each of the network types exist.

Result 1: Characterizing network structures across 14 research sites

The agricultural development networks from each site are visualized and grouped by type, using natural break points in the network density, centrality and fragmentation statistics (Figure 2). We found clear evidence for shared (high density, low centrality) and brokered (low density, high centrality) network structures, and a surprisingly high number of fragmented (many isolated actors) networks. Five sites were classified as shared structures, four sites as brokered, and five sites as fragmented structures. We were interested in understanding why the fragmented structures were just as common as the others, and what the research teams found in these sites. The East Africa research team noted “...a weak link between most organizations and the ward extension workers from the district council. This was confirmed by the fact that the majority of them [organization representatives] were not aware, apart from hearing here and there from few farmers, who are involved in the specific activity.”

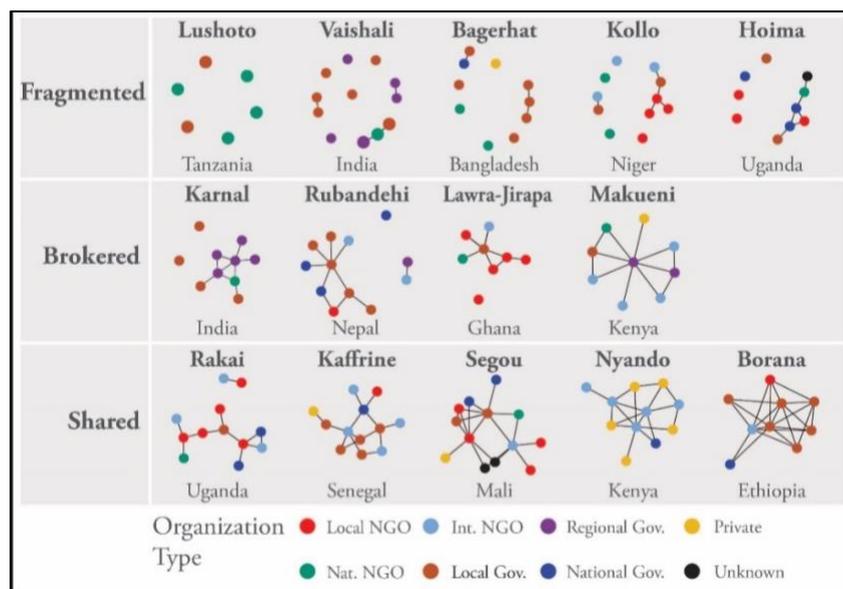


Figure 2. All 3 network types are observed across 14 CCAFS sites.

To better understand why different network types exist, we need more measures of network structure over as many communities and time periods as possible. Thus, this work is being extended in the CCAFS mid-line surveys currently underway, to follow up on these networks and understand if and how they have changed over time. To better understand the functional differences between fragmented, brokered and shared networks, it is critical for future research collecting network data to also measure network outcomes, so that we directly assess the effectiveness of different network structures for reaching specific goals. We can then compare the efficacy of organizations' activities in sites where networks are well connected (i.e. shared or brokered networks), compared to sites where organizational networks are highly disconnected (i.e. fragmented networks). Our next steps are to begin testing the effects of network connectivity and coordination on outcome variables collected by CCAFS at household and village levels, such as household food security and other indicators of climate analysis resilience.

What roles do local and international organizations play in these networks?

Understanding leadership in networks is critical to assessing both the potential efficacy of the network structure and how various actors carry power and influence over others working in the site. Organizations that are local, embedded within the community and provide their own services are predicted to fill leadership positions in networks with many actors that have greater differences in their goals, approaches and/or resources, and where greater social capital is needed to build cohesion across actors. External organizations (i.e. international NGOs, or INGOs), entering the community from the outside, are predicted to be found as leaders in complex circumstances, when the cost of coordination is high and access to resources is essential to effective coordination.

Organizational networks in developing contexts became popularized in the 1990s when the World Bank recognized the importance of non-state actors and social capital as key policy tools that could provide public services and build local capacity when state governments neglect these responsibilities. At the heart of this debate is the distinction between importing capacity and resources of INGOs into under-resourced communities, versus relying on the local knowledge and potential legitimacy of domestic organizations. Some literature has suggested that in acute humanitarian response networks, INGOs have been found to be effective network leaders because of their ability to provide and distribute needed resources that were otherwise unavailable. In initiatives working to address long-run development challenges however, emphasis has been placed on capacity-building among local governments and organizations that already hold familiarity among their communities. For example, "islands of sustainability" can be achieved when local organizations

take a leadership role in agricultural networks and empower rural smallholders by distributing technology and negotiating on their behalf with more powerful state and international actors for access to loans, financing and markets. Thus, the influence of local social capital can play a critical role in establishing legitimate leadership in local development projects.

Result 2: Local organizations and international NGOs in networks

To assess what roles various types of organizations play in their networks, we identified the organization type of each site's most central actor (i.e. greatest number of partnerships) and compared the average number of partnerships of organizations working at local, regional, national, and international scales. We found the most central nodes in all four brokered network sites were local or regional governments, indicating that local network leadership is more common in brokered networks. In three out of five shared sites, the most central nodes were local governments or local NGOs, again indicating higher likelihood of local network leadership in shared sites. Despite the local/regional scale actors filling the most central positions in brokered and shared governance networks, international NGOs had a slightly higher average number of partnerships across all sites. This can be explained by considering that INGOs were present in only one of the fragmented networks, whereas local and regional organizations comprised most of the actors in fragmented sites. In shared network sites, local/regional actors and INGOs had comparable numbers of partnerships, reflecting greater connectedness overall and greater coordination across actors at different scales. In brokered network sites, INGOs had fewer partnerships on average than local/regional scale organizations, likely because these local/regional organizations were most frequently occupying the most central positions.

We also evaluated if the presence of an INGO in a site influenced overall network connectivity. We found a positive correlation between the density of partnerships in a network and the percentage of INGOs in a site, suggesting INGOs contribute to increased network connectivity. The average percentage of INGO actors in fragmented networks (5%) was significantly lower than that in brokered (18%) or shared (25%) networks. In fact, only one out of five fragmented network sites (Kollo, Niger) had any INGO presence at all, again providing support for the positive effect INGOs have on overall network connectivity. When looking at the effect of longevity of INGO presence in a site, we also found a positive correlation between overall partnership density in the network and the average number of years an INGO was in a site. However, between brokered and shared networks, we found little difference in the average time INGOs had been present: an average of 20 years in brokered and 17 years in shared network sites.

Conclusions and policy implications

This project uses the CCAFS OBS data to characterize and explore how agricultural development networks vary across region and place. Our analysis provides insight on the structure and composition of inter-organizational collaboration in CCAFS sites, where organizations aim to work together effectively and efficiently within local communities to build climate and agricultural resilience and food security. We draw two findings that we believe can help inform collaborative approaches to building community resilience in the face of climate change.

First, the structures of partnership networks can vary quite greatly, from hierarchically-organized *brokered* networks, to densely connected *shared* networks, to very low partnership *fragmented* networks. Each of these network configurations may have implications on how climate change resilience and agricultural development efforts are implemented and coordinated across the group of public and private organizations working within a given site.

Second, we found that local and regional organizations (both government and NGO actors) most often fill central leadership roles in networks with greater connectivity. This suggests these local and regional entities are necessary partners to involve in any new effort aiming to enter a community, as they hold the key to effectively coordinating on the ground work. At the same time, INGOs play an important role in increasing connectivity across a site, specifically by partnering with different local/regional organizations (rather than with other INGOs). These local-international partnerships appear crucial to both gaining local trust and excitement for an initiative, as well as leveraging external resources and connections.

Finally, through this work, we also learned the necessity of collecting network data on the “periphery” organizations (i.e. community-based groups, farmer cooperatives, informal support networks in a community) who may be outside of the formalized, key actors, yet still provide critical connectivity between organizations via personal relationships, or who may be key links between community residents and organizations’ efforts. This indicates a key next step in studying agricultural development networks.

Further Reading

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