



PHOTO CREDIT: IRC WASH

Sustainable WASH Systems Learning Partnership

# Using Social Network Analysis in WASH Programs

May 2020  
Diana Harper, LINC

## Introduction

The relationships between water, sanitation, and hygiene (WASH) actors are critical for improving and sustaining WASH services. Social network analysis (SNA) is a powerful tool for studying social systems that focuses attention on the complex relationships among actors in a system. Specifically, it shows the relationships among actors, who can be individuals or organizations. It can increase the understanding of the structural characteristics of a network, such as who the central actors in a network are, how tightly interconnected or fragmented the network is, and what subgroups or clusters exist. This information can highlight strengths and weaknesses in communication, the flow of resources, power structures, and the overall functioning of the network.

As part of an overall systems approach to WASH, the United States Agency for International Development’s Sustainable WASH Systems (SWS) Learning Partnership is applying SNA across a range of activities in Ethiopia, Kenya, Uganda, and Cambodia, with 12 of 19 planned applications completed to date. This learning brief summarizes SWS’s application and use of SNA. Future learning materials will further detail the results and lessons learned from using this systems tool in low-resource WASH settings.

### Summary

SNA is a systems analytic tool for exploring relationships and networks. SWS in Ethiopia, Kenya, Uganda, and Cambodia applied this tool to:

- **Design and Plan WASH interventions:** Understanding the current structure of the network informed SWS program strategies, interventions, and partnership approaches.
- **Monitor WASH networks:** Repeated SNAs offered insight into how network characteristics and behaviors shifted over time, particularly efforts to foster collective action.
- **Strengthen WASH networks:** SNA helped local stakeholders consider the impacts of non-tangible factors on services, such as their relationships with local government or the importance of information sharing among stakeholders.

To date, SWS has completed 12 of 19 planned applications of SNA, generating practical insights for WASH practitioners on how to best use SNA in low-resource settings.

**Table 1.** Progress of Planned SWS Social Network Analyses

|          | Locations                             | SNAs Planned                          | SNAs Completed     |
|----------|---------------------------------------|---------------------------------------|--------------------|
| Ethiopia | Debre Birhan, Mile, South Ari, Woliso | Baseline, midline, endline (12 total) | Baseline, midline  |
| Uganda   | Kabarole, Kamuli                      | Baseline, endline (4 total)           | Baseline (2 total) |
| Cambodia | National                              | Baseline (1 total)                    | Baseline (1 total) |
| Kenya    | Kitui                                 | Baseline, endline (2 total)           | Baseline (1 total) |

## SNA Applications in SWS

Table 2 below summarizes the network analyses conducted under SWS. Across four countries and four different implementation teams, SWS used SNA to design interventions and strategies based on current network structures. In several cases, these analyses examined existing collaboration structures (Kitui WASH Forum in Kenya) or potential collaboration structures (learning alliances in Ethiopia and Uganda) the SWS teams sought to create or strengthen. In other cases, the analyses examined broader relationships in the water (Kamuli, Uganda) or WASH sectors (Cambodia national). In all cases, SWS conducted an organizational network analysis (ONA) to examine relationships among organizations, not individual people

**Table 2.** Network Analyses Conducted under SWS

|                    | Ethiopia<br>(IRC WASH and Tetra Tech)                                     | Uganda<br>(IRC WASH)                          | Cambodia<br>(WaterSHED)  | Uganda<br>(Whave)                             | Kenya<br>(University of Oxford)               |
|--------------------|---|---|--|---|---|
| Subjects           | Learning alliance and other water and sanitation actors in four locations | Rural water supply actors in Kabarole         | WASH actors nationally   | Rural water service delivery actors Kamuli    | WASH Forum and water actors in Kitui County   |
| Primary Purposes   | Design and Monitoring   | Design and Monitoring                         | Design   | Design and Monitoring                         | Design and Monitoring                         |
| Timing             | Baseline, midline, endline  | Baseline, endline                             | Before strategy development  | Baseline, endline                             | Baseline, endline                             |
| Data Collection    | Roster  | Roster with sample                            | Roster   | Roster with sample                            | Roster with open-ended response               |
| Network Size       | ~15-20 per location   | 49  | 99   | 46  | 75  |
| Relationship Types | Information, problem-solving, reporting, and coordination                 | Information, skills, resources, and authority | Information, involvement, resources, communications, and influence | Information, skills, resources, and authority | Information, skills, resources, and authority |



SNA data collection in Uganda. Photo: Duncan McNicholl

All of the analyses used a roster to define the initial set of interviewees, which means the list of actors came from consultations, secondary sources, and/or surveys conducted before data collection. Through an interview and/or visual mapping exercise during data collection, each actor defined their relationships with all other actors on the roster. In both SNAs in Uganda, it was not feasible to include all actors at the sub-county and community level, such as all local councilors and water and sanitation committees. As a result, the study used a sample of communities. In Kenya, the 25 actors on the initial roster also received an open-ended response to add other actors with whom they collaborate, resulting in a total network size of 75. In all cases, additional data collection efforts accompanied the SNA, such as qualitative analysis of factors contributing to WASH sustainability.

Studies examined relationship types such as information sharing, the flow of resources and skills, and perceptions of influence and authority. These relationship types were selected based on the theory of change for the local interventions and advice from the technical experts planning the SNAs. There are plans for repeated data collection in Ethiopia, Kenya, and Uganda to monitor changes in the network. In all cases, SWS teams presented the research findings back to stakeholders in a workshop setting to validate the results and develop relevant actions and interventions.

## SNA in Designing WASH Interventions

The wide application of SNA at baseline reflected a keen interest across the SWS consortium to use network analysis to understand the current structure of the network to inform program strategy, interventions, and partnership approaches. Specifically, SNAs helped to:

**Identify existing structures of collaboration to build upon.** In Ethiopia, many of the networks showed a strong core/periphery structure, with some central actors, mainly government, engaging with a broader set of government and non-government actors on issues of water and sanitation. This strong core provided support and encouragement to existing plans to form learning alliances. These learning alliances have a core set of steering committee members who can work with a wider set of peripheral members to address challenges to sustainability in their local context. In Kenya, the SNA found a higher number of relevant WASH actors than core stakeholders initially anticipated, and the County WASH Coordination Office had a central position in the network. This finding lent support to the strategy to bolster the local leadership of the county office, using the existing collaboration structures to work with a wider group to accomplish its goals.

**Identify gaps in collaboration to improve.** In Uganda (Kabarole), the SNA showed that communities were the most isolated actors in the network. This finding provided support to strengthen community engagement and generated specific actions. Similarly, in Uganda (Kamuli), the SNA examined the relationship between water user committees and sub-county officials. This examination uncovered a lack of connection between political and technical actors. It generated a desire among partners to strengthen this relationship to develop solutions for rural water maintenance.

**Offer advantages over traditional stakeholder assessment methods.** According to implementing partners, the SNA results are thought to have more validity and better represent reality because the data are from the collective perspectives of the stakeholders. Additionally, the analyses provided visual tools local stakeholders found compelling. These tools were cited as a benefit in the Uganda and Kenya SNAs using visual



mapping as part of the data collection interview, and across all project teams where SNAs prompted better discussion among stakeholders during validation workshops.

### SNA in Monitoring WASH Interventions

The second major application of SNA in SWS was for monitoring change in networks. Most teams planned to repeat SNAs to understand how network characteristics and behaviors shifted over time. Many of the partnership's interventions centered on increasing collaboration among WASH actors. As a result, they expected the SNA would help them verify if expected changes in connectivity were occurring.

In 2019, SWS conducted midline SNAs in Ethiopia for the four water and sanitation learning alliances. The results showed increases in overall connectivity, number of ties among actors, and quality of information sharing and problem-solving relationships. In addition, the SNAs showed some organizations with infrastructure mandates were less prominent in the networks, while actors focused on the social sector, local government, and academic issues were more prominent. This finding suggests the learning alliances may be addressing water and sanitation issues with more multi-sectoral, inclusive, and long-term viewpoints.

In combination with other data sources such as outcome mapping of local stakeholder actions, building block analyses, and implementing partner observations, the SNAs supported the conclusion that local networks are stronger as a result of SWS interventions. At the same time, the SNAs identified specific areas for further attention during the implementation period, including the need for involvement of non-governmental actors in WASH networks. Plans are in place for endline analyses in Ethiopia, Kenya, and Uganda in late 2020 and early 2021.

### SNA for Strengthening WASH Networks

SNA can also be an intervention because it helps actors see themselves in their networks, and sparks discussion and action. Across all four countries, SWS teams held participatory workshops with stakeholders to understand, validate, and act upon the results. In most cases, the workshops occurred alongside action planning sessions, which reportedly encouraged local actors to

take a more inclusive and collaborative approach. In this way, SWS implementation teams emphasized that SNA is useful when working with local stakeholders to **shift from a technical, compartmentalized mindset** to a systems mindset recognizing complexity, adaptation, and interactions. In some cases, the network analysis served more as a visual aid for discussion, while in other cases, the groups focused more on the detailed data in the study. The SNA reportedly helped stakeholders consider how the structure of their network relates to their objectives for sustainable WASH services.

Some SWS teams noted that in the course of implementation, they are **using the results from the SNA on an ongoing basis**. For example, in Kenya, the team reports using the SNA as an aid when trying to decide the best actors to share a new technical resource through their network, or which actors might support advocacy for a new policy.

### Considerations for Using SNAs in WASH

For those considering the use of SNA in their WASH program, a common question is how to plan and budget for the activity. Similar to other efforts, the size and complexity of an SNA can vary. In SWS, SNAs had different methods, network sizes, and data collection approaches, according to their intended uses and audiences. Key decisions and considerations in this process included:

- **Purpose of the analysis.** Having a clear purpose and research question(s) is critical to any analytic effort, including SNA. Defining the purpose includes determining if the SNA is for design, monitoring and evaluation, network strengthening, and/or any other purpose. While there are different ways to apply SNA, it is often selected as a tool when the relationship between the actors and the structure of the system is vital to program outcomes. Defining the research question(s) also helps to narrow the scope of the SNA and ensures the efficient use of resources. Because SWS is a global learning project, there was a high interest in using a variety of systems tools in field implementation. But SNA is neither needed nor appropriate for every WASH program.
- **Type of data collection.** A significant cost and time consideration is whether to collect SNA data through

primary or secondary sources. For the networks of interest in SWS, there were not existing and relevant datasets to answer the teams' specific questions. As a result, all cases used primary data collection. Additionally, SWS collected all data in person rather than through phone or internet, as this was the best way to reach targeted actors.

- **Size of the network.** The larger the network, the more time and resources are necessary to collect data. In SWS, network sizes ranged from as small as 15 in one location in Ethiopia to as large as 99 in Cambodia. In Uganda, the actual networks, which included sub-county and community-level actors, were too large to include as a whole within the program's time and budget constraints. As a result, the analysis used a sample of actors.
- **Composition of the network.** Planning is affected by how much the network members are defined in advance of the data collection effort. In SWS, there were several rounds of surveys and discussions to establish the boundaries of the networks (meaning, which actors to include or not include in data collection). In some cases, local partners were surprised by the time and attention needed for this aspect of planning the SNA.
- **Integration of research into implementation.** Whether a research activity is a standalone data collection or incorporated into other efforts affects both the time and budget required. In nearly all

cases in SWS, the collection of SNA data happened alongside additional types of data collection, such as factor analysis and building block analysis. A related consideration is whether the project team themselves or an external team will collect the data. In some cases, SWS implementation teams were more involved in the data collection than in others. This involvement required an upfront investment in training and dedication of staff time, but it appeared to have the benefit of increasing local understanding of the tool and use of the findings.

- **Stakeholder engagement.** Both before and after conducting the SNAs, SWS teams invested substantial time in stakeholder outreach. With the understanding that this was a new tool for these WASH stakeholders, SWS teams engaged actively with them during design, implementation, and follow-up to validate and interpret results. While these steps required additional time and coordination, SWS teams placed a high value on these processes for improving the quality and relevance of SNA findings.

### Acknowledgments

This learning brief was prepared by Diana Harper, LINC, with valuable contributions and support from SWS colleagues. Future learning materials on this topic will further detail the SNA applications in SWS and give guidance on how to best apply SNA in international WASH settings. For more information, contact Diana Harper at [dharper@linclocal.org](mailto:dharper@linclocal.org).

### About the Sustainable WASH Systems Learning Partnership:

The Sustainable WASH Systems Learning Partnership is a global United States Agency for International Development (USAID) cooperative agreement to identify locally-driven solutions to the challenge of developing robust local systems capable of sustaining water, sanitation, and hygiene (WASH) service delivery.

This report is made possible by the generous support of the American people through USAID under the terms of the Cooperative Agreement AID-OAA-A-16-00075. The contents are the responsibility of the Sustainable WASH Systems Learning Partnership and do not necessarily reflect the views of USAID or the United States Government.

For more information, visit [www.globalwaters.org/SWS](http://www.globalwaters.org/SWS), or contact Dan Hollander ([Daniel.Hollander@colorado.edu](mailto:Daniel.Hollander@colorado.edu)) or Elizabeth Jordan ([EJordan@usaid.gov](mailto:EJordan@usaid.gov)).

