



Multi-Use Water Systems in Food Security Programs:

A summary of key issues impacting sustainability and resilience



PRO-WASH and SCALE

PRO-WASH is an initiative funded by the U.S. Agency for International Development's (USAID's) Bureau for Humanitarian Assistance (BHA) and led by Save the Children. PRO-WASH aims to provide support to implementing partners in order to strengthen the quality of WASH interventions through capacity strengthening, knowledge-sharing and applied WASH research opportunities. PRO-WASH's approach to providing support is driven by a commitment to empower BHA partners to become technical leaders in WASH, particularly for vulnerable and food insecure communities.

SCALE is an initiative funded by USAID's Bureau for Humanitarian Assistance (BHA) to enhance the impact, sustainability, and scalability of BHA-funded agriculture, natural resource management, and alternative livelihoods activities in emergency and non-emergency contexts. SCALE is implemented by Mercy Corps in collaboration with Save the Children.

Disclaimer

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Introduction

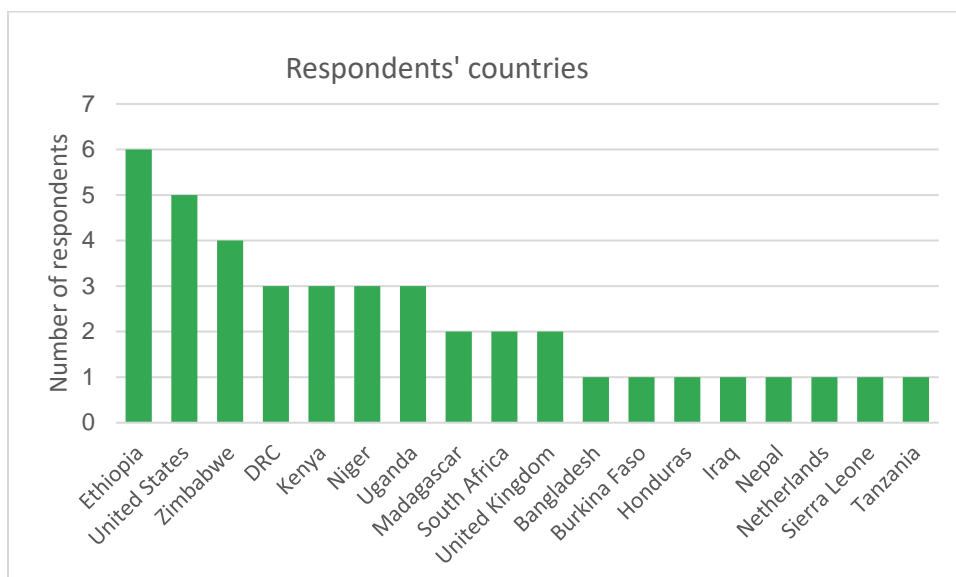
Multi-Use Water Systems (MUS) is an approach to water service delivery that takes into consideration the needs of both WASH and agriculture activities. A MUS is designed to supply domestic water *as well as* water for productive uses, such as irrigating a garden or operating a small business. By providing reliable water access to communities or households, MUS can boost users' resilience to shocks and stresses, improve food security, and support livelihoods and economic activities. But MUS can also present a more complex set of challenges than single-use water services, which are not always solved by standard approaches to WASH infrastructure.

MUS is already a part of many USAID Bureau for Humanitarian Assistance (BHA)-funded Resilience Food Security Activities (RFSAs), and RFSAs partners have shown continued interest in learning about ways to improve the operation and sustainability of these systems. In response, [PRO-WASH](#) is now collaborating with the [SCALE](#) Award to jointly initiate and fund research into one or more key issues in MUS, in collaboration with RFSAs partners. The focus will be on applied research, ideally resulting in tools, guidance, or findings relevant to multiple BHA partners and active projects supporting food security and WASH activities.

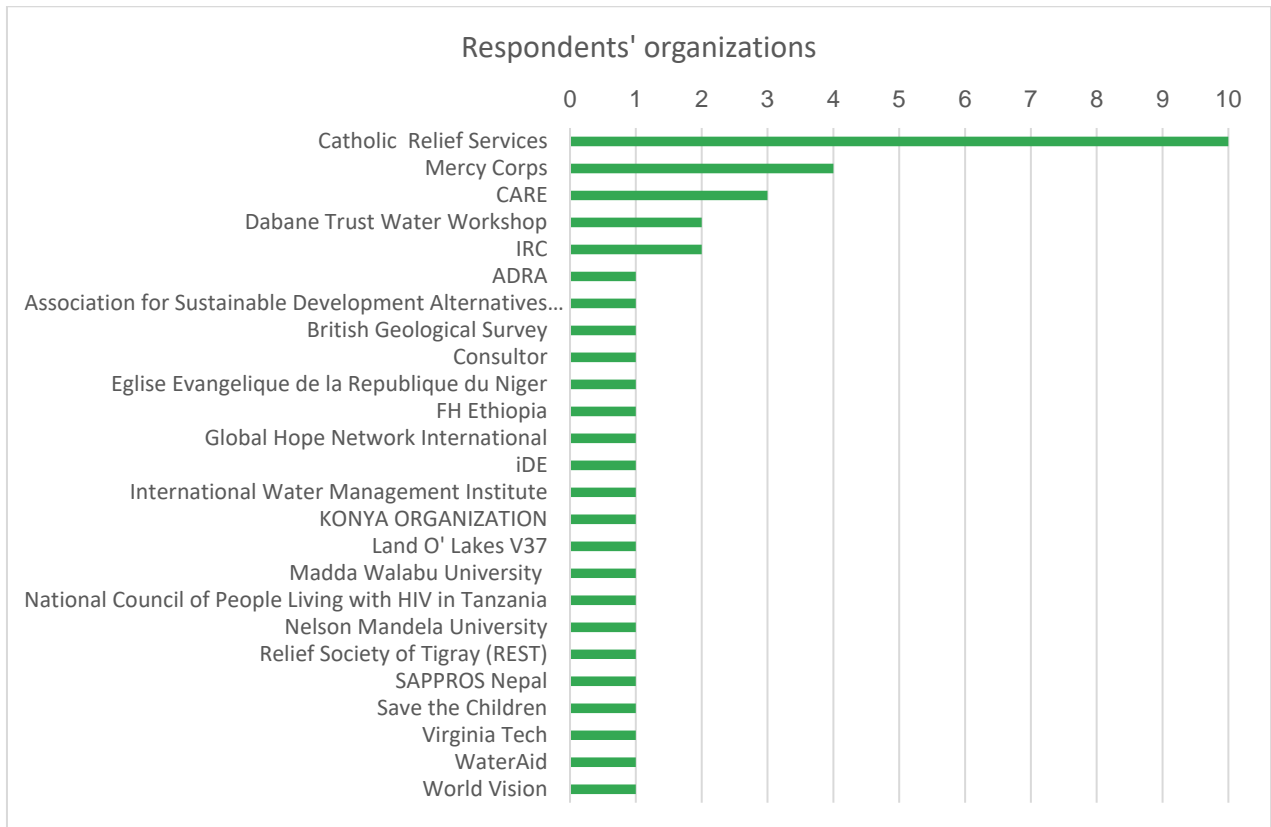
Methodology: Survey and Interviews

In the first half of the 2021, SCALE and PRO-WASH have worked with RFSAs and sector experts to understand some of the key issues that impact MUS sustainability. This work included an open, on-line survey, disseminated through a number of channels which resulted in 42 responses from RFSAs and MUS experts in countries around the world. More than two thirds of the survey respondents either work for, or have worked for, a RFSAs. About the same proportion of respondents are currently working on a program with an existing MUS activity that would benefit from partnering with a research entity to carry out further research into MUS.

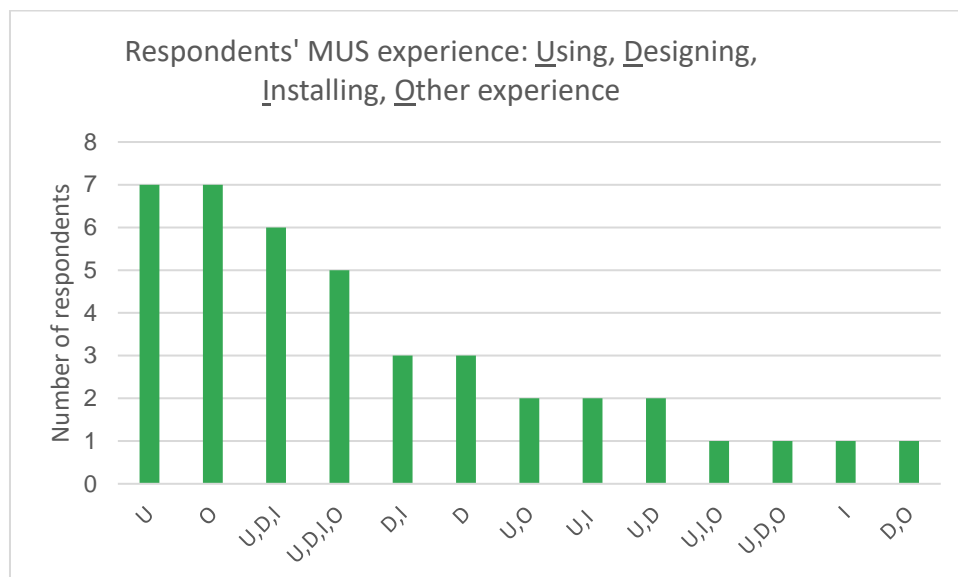
The online survey was followed up by more in-depth one-on-one interviews with approximately one in five of the online survey respondents, and a review of relevant literature. An analysis of the MUS survey data showed that the respondents were drawn from around the world with a higher concentration from sub-Saharan Africa.



Survey respondents came from more than twenty organizations, with Catholic Relief Services and Mercy Corps providing the most responses:

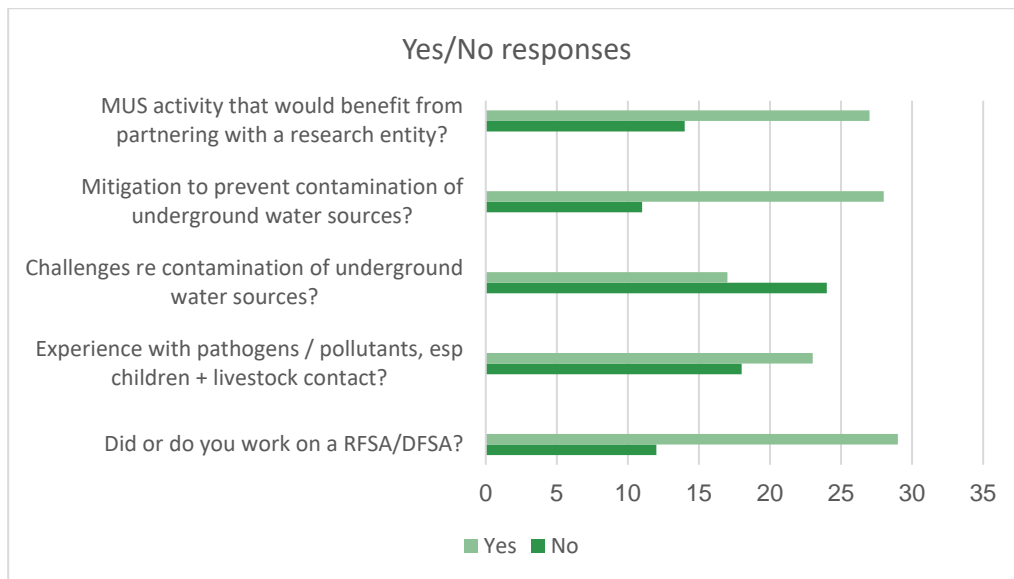


Respondents' experience in Using, Designing, or Installing MUS, or Other experience, can be summarized in the following chart. For example, seven respondents had experience in using ("U") MUS, six respondents had experience in using, designing and installing MUS ("U,D,I"), and so on.



Five of the survey questions were simple yes or no questions, as follows:

1. Did you or do you work on a RFSA/DFSA?
2. Do you have problems or experience with pathogens and pollutants, particularly where MUS brings children and livestock into contact?
3. Are you facing challenges in preventing contamination of underground water sources when MUS are used to water livestock?
4. Does your project take mitigation measures to prevent contamination of underground water sources from pathogens or other pollutants like pesticide/fertilizer?
5. Are you currently working on a program with a MUS activity that would benefit from partnering with a research entity to carry out action research exploring any of the issues above?

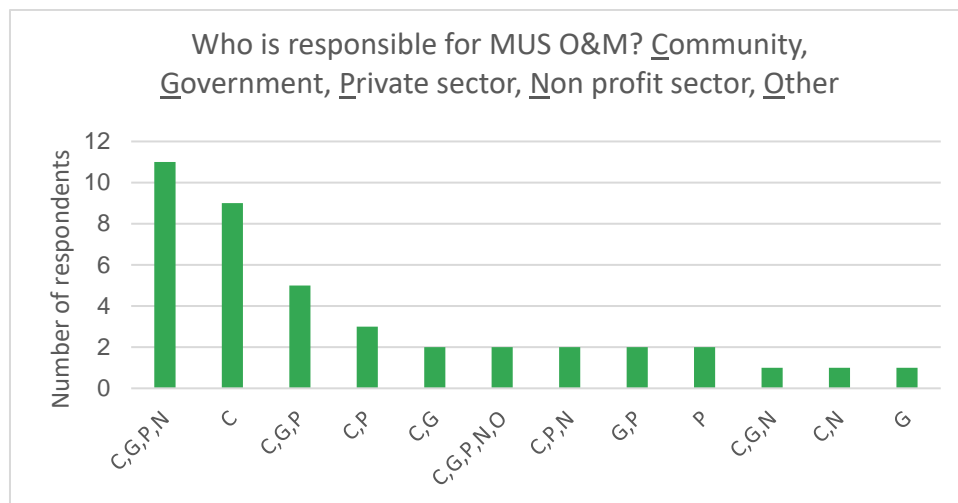


These yes/no questions were followed by eight in-depth and open-ended questions, which can be grouped together into four main topic areas, as follows:

Topic Area	Open-ended Questions
Area 1: Operation and maintenance of MUS, and long-term sustainability	<ol style="list-style-type: none"> 1. Who should be responsible for operating and maintaining a MUS? Please explain your answer to the question. 2. In your opinion, what are the main issues that impact the long-term sustainability of MUS?
Area 2: Challenges with pollutants and pathogens	<ol style="list-style-type: none"> 3. Please describe your challenges with pathogens and pollutants. 4. Please describe your challenges in preventing contamination of underground water sources. 5. Please describe the mitigation measures being used to prevent contamination of underground water sources from pathogens or other pollutants.

Area 3: Information needed for better MUS operation, as the climate changes	6. What kinds of information would allow for the better utilization and management of MUS as the climate changes?
Area 4: Main MUS research topics	7. In your opinion, what are the main research issues that need investigating, related to MUS? 8. Please explain the program, the MUS intervention(s) of interest, and the research question(s) you're most interested in exploring.

Related to the first topic area, a central issue that arose was which group or entity should take overall responsibility for the operation and maintenance (O&M) of a MUS system, once it has been installed. Should this be the community, government, private sector, the non-profit sector, or somebody else? Most survey respondents valued community ownership and responsibility, often because other entities or "external actors" are not available or are not reliable. Only five respondents (12%) saw no role at all for the community, while nine respondents felt that the community alone should take on this responsibility. The following chart shows the range of survey responses to this question.



By contrast, the one-on-one interviews did raise concerns with "community only" O & M, as MUS requirements for O&M are typically higher than for domestic-only sources. Most respondents (71%) saw a partnership of some kind (a "joint effort," as one respondent put it) as the ideal approach. This view is echoed in the survey, in which most respondents (11) favored some combination of community, government, private sector, and non-profits working together. As one respondent put it, "It really depends on the capacity of each entity in the region. There is really no one correct approach. The approach should be based on the relative capability of each actor. The approach is also likely to evolve as actors develop skills/knowledge."

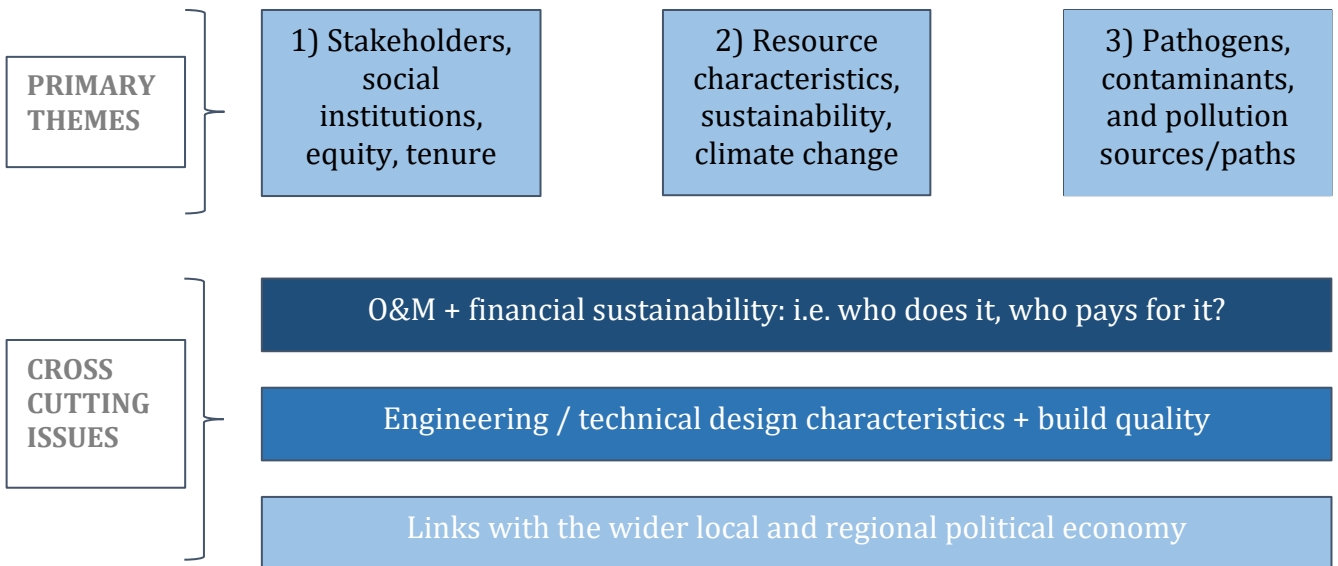
Related to the institutional configuration of stakeholders is the question of financial sustainability, and this was an issue raised by several survey respondents and interviewees. The amount that users pay, who they pay it to, and whether certain uses (e.g., domestic) are charged at higher rates than other uses (e.g., irrigation) are all questions that depend on the local context and on existing institutions. All agreed,

however, that having sufficient income to cover routine expenses and running costs, as well as less frequent replacement of worn parts, was an essential element in overall system sustainability.

Respondents’ views on the second topic area, challenges with pollutants and pathogens, centered around considerations regarding both the uses to which the water is put and the industries that it supports. For example, use of pesticides or fertilizers as part of agricultural water use raises the risk that these contaminants will find their way into domestic supplies. This topic area is also closely related to the physical environment since pathogen transmission in the subsurface is heavily dependent on the natural hydrogeological context. Several interviewees also raised the issue of how to improve capacity for testing water quality, as well as the infrastructure and other assets that this may require (e.g., laboratories, road transport, funding for sample collection).

Related to the third topic area, survey respondents and interviewees focused on the characteristics of the water resource (volume and quality) that sustains a MUS, and understanding whether the resource will be robust enough to support the additional volumes demanded by a MUS. More than one survey respondent recommended research into methods to determine the hydrological or hydrogeological context to facilitate better planning of MUS. Such methods do already exist, and a groundwater assessment or other environmental due diligence at the MUS planning stage is already recommended.

The fourth topic area, identifying important research topics in MUS that the SCALE and PRO-WASH team could engage with, led to considerable discussion with interviewees following the survey. These discussions have been summarized in the following diagram, identifying three primary themes and three cross-cutting issues that apply to MUS:



Preliminary Conclusions

The importance of understanding and designing for local context was emphasized by several survey respondents and interviewees. Beyond the broader principles of operating and sustaining a MUS, such as the need for financial solvency or routine O&M, there seems to be no single recipe for success. The wider political-economic context in which a MUS will operate is also important, as it relates closely to the kinds of

economic activities that the MUS may be able to facilitate. As one respondent put it, “The main issues vary based on the local geographic, WASH, regulatory, NGO, political, etc. contexts. What is clear from this research is that successful MUS systems are designed with a clear understanding of the productive activities that communities would like to undertake, specific (multiple) water sources are linked with specific productive activities, the water committees/user associations have regular/consistent training support (from NGOs or government) with regards to both technical and managerial skills/knowledge, and consideration has been given to the sale of goods in local/regional markets (i.e., food supply networks are well developed).”

Given this vital feedback, it is clear there is no one element of MUS design or implementation that holds the key to success; however, our conversations have illuminated the foundational importance of ownership and governance of these systems. To that end, we have begun to dig deeper into the theme of MUS governance and O&M, including private sector engagement, cooperative partnerships, and financial sustainability.

SCALE and PRO-WASH are now working on identifying a program partner and defining two or three specific research questions, which will form the basis of a call for proposals and the foundation of the actual research itself. The research is scheduled to be completed roughly 12 months from now. Stay tuned for a Request for Applications (RFA), coming out soon. We thank all of those who have contributed to this effort by completing the survey, participating in an interview, or sharing literature and materials with us.

