

Review Paper

Understanding empowerment in water, sanitation, and hygiene (WASH): a scoping review

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ABSTRACT

In low- and middle-income countries, a common component of water, sanitation, and hygiene (WASH) interventions is the goal of empowerment of beneficiaries, particularly poor households. Empowerment is viewed as an important development goal in itself, as well as a way to obtain improved WASH outcomes. However, empowerment is a complex and multi-dimensional concept, and it is often not clear how it is defined in WASH sector programming. This scoping review explores how concepts of empowerment have been used in the WASH sector and delineates relevant empowerment dimensions. Medline, Embase, and Global Health databases were searched for in the peer-reviewed literature published in English. A total of 13 studies were identified. Five major interrelated empowerment dimensions were identified: access to information, participation, capacity building, leadership and accountability, and decision-making. This review provides researchers and practitioners with a greater understanding of dimensions of empowerment that are relevant for strengthening WASH interventions, as well as tracking progress toward gender and social equality outcomes over time. This understanding can help ensure inclusive WASH service delivery to achieve gender-sensitive Sustainable Development Goal (SDG) targets for universal water and sanitation access.

Key words | empowerment, equality, gender, scoping review, water security

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INTRODUCTION

Though water and sanitation are fundamental for promoting good hygiene behavior, health, and well-being, many individuals and communities remain without safe water and sanitation facilities. The WHO/UNICEF Joint Monitoring Program for Water Supply, Sanitation and Hygiene (JMP) reported that 2.1 billion people lack access to safely managed drinking water at home and 4.5 billion people do not have access to safely managed sanitation facilities globally (UNICEF 2017; UNICEF & WHO 2017). In addition, existing services are threatened by rapid urban population growth, rising inequalities, and climate change associated events such as droughts

that exacerbate WASH challenges and undermine efforts to address service gaps (World Water Assessment Program 2015). Inadequate access to water has impacts on public health and the mental, physical, and spiritual well-being of individuals and households (Sultana 2011). Aside from preventable deaths and physical illnesses related to waterborne disease, the lack of access to water and sanitation leads to feelings of anxiety, a sense of embarrassment, and feelings of distress (Wutich 2009; Harryson *et al.* 2016).

In many cases, women, poor household, and marginalized groups disproportionately experience the impacts of

inadequate WASH partly because they are more likely to have limited access to services (Graham *et al.* 2016; Mekonnen & Hoekstra 2016; Stevenson *et al.* 2016; Bisung & Elliott 2017). Many marginalized groups also have less say, both within the household and in their community, in decision-making processes and governance of resources relating to WASH (Routray *et al.* 2017). Many WASH programs and interventions, therefore, use the rationale that empowering beneficiaries will increase equitable access and sustainability of water and sanitation infrastructure (Sheuya 2008; World Water Assessment Program (WWAP) 2015; Leahy *et al.* 2017). Empowerment approaches in the WASH sector have also increased over the years in line with the prominence of gender equality on the international development agenda (Reed *et al.* 2007).

Measuring WASH outcomes from empowerment perspective involves assessing important technical concerns of services and infrastructure and how these interact with social and cultural factors (Leahy *et al.* 2017). However, the measurement of progress toward achieving universal WASH coverage targets 6.1 and 6.2 in the Sustainable Development Goals (SDGs) remains focused on technical aspects, particularly monitoring access to WASH facilities. This focus may not fully capture the importance of WASH services for improving human well-being and addressing social inequalities (Sweetman & Medland 2017; Gimelli *et al.* 2018). One barrier to measuring empowerment outcomes is inconsistencies and gaps in the definitions and applications of empowerment concepts in the WASH sector. Miedema *et al.* (2018) detailed a lack of consensus on what constitutes empowerment and how empowerment can be measured across countries. Cornwall (2008), Kabeer (2011), and Miedema *et al.* (2018) argue that current global and cross-national indices of empowerment, including the Gender-related Development Index, Gender Empowerment Measure, and the Women, Peace and Security Index, measure different aspects of empowerment and omit some domains. Also, empowerment is largely described in the literature as both a process by which WASH services could be improved as well as the result of improved WASH services. By reviewing how empowerment dimensions have been articulated in the WASH sector so far, we hope to contribute to developing more accurate, consistent and useful tools for the measurement of empowerment. As policymakers

and water and sanitation organizations widen their focus and monitoring tools in line with the SDG agenda, it is timely to reflect on the meaning and measurement of empowerment in the WASH sector.

Conceptualizing empowerment in the WASH sector

The literature on empowerment usually refers to notions of power, agency, control, and decision-making (Zimmerman 1995; Malhotra *et al.* 2002; Alsop *et al.* 2006). According to Alsop *et al.* (2006), empowerment is conceptualized as a group's or individual's capacity to make effective choices and then transform those choices into desired actions and outcomes. This capacity is influenced by two factors: agency and opportunity structures (Narayan 2002; Alsop *et al.* 2006). Agency is the ability of citizens or communities to make meaningful choices, while opportunity structures are aspects of the institutional context in which citizens and communities achieve their desired outcomes (Alsop *et al.* 2006).

Kabeer (2005) also defines empowerment as 'the processes by which those who have been denied the ability to make choices acquire such an ability' (p. 13). Kabeer explored empowerment through three interconnected dimensions: resources, agency, and achievement (Figure 1). In her view, resources do not only include material resources but human and social resources which enhance one's ability to choose (Kabeer 1999). Thus, resources are the channels for exercising agency. Agency refers to the ability of a person to define goals and acts upon them or to put them into effect (Kabeer 1999, 2005). The last dimension, achievement, represents the failure or realization of individuals' potential for living the life they want (Kabeer 1999, 2005). We draw on these understandings to define empowerment as a process through which individuals or groups exercise the ability to choose and live the life they desire.



Figure 1 | Kabeer's empowerment framework (Kabeer 1999).

Although empowerment is a broad concept touching on many parts of life, there is a growing body of sector-specific research that examines the importance of empowerment for achieving development outcomes. For example, tools have been developed for examining empowerment dimensions in the agricultural sector (Alkire et al. 2013), health promotion (Laverack 2007), and disability (Bakker & Van Brakel 2012). However, there is limited evidence of what constitutes empowerment in the WASH sector as often efforts are focused on access to WASH facilities. Thus, attempts to directly monitor and evaluate WASH intervention that seeks to empower beneficiaries lag behind. Further, the definition of empowerment within the WASH sector remains unclear partly because empowerment processes within the sector are not directly observable. It is argued that the presence of empowerment can only be deduced through its action or outcomes such as control of income and access to resources (Kevany & Huisingsh 2013; Schweitzer et al. 2014; Ewerling et al. 2017). This review aims to identify key dimensions that could inform the development of tools for evaluating and monitoring empowerment within the WASH sector.

METHOD

This scoping review was informed by Arksey & O’Malley’s (2005) framework for conducting scoping reviews and mapping evidence. The framework represents a methodology that allows the assessment of emerging evidence as well as the identification of gaps for research development. The scoping review was used for the study based on two reasons: (1) scoping reviews are useful for examining emerging evidence when it is still unclear how a topic is understood in the literature and (2) scoping reviews are useful when the literature on a topic has not yet been comprehensively reviewed (Pham et al. 2014).

Search strategy

Three main electronic databases were used for the search: Embase, Medline, and Global Health. Two main concepts were used to develop the search strategy: water, sanitation and hygiene; and empowerment (detailed search terms are provided in Table 1). All searches were conducted in March 2018.

Table 1 | Detailed search terms

Database	Broad search terms
Embase (via Ovid)	‘water’ or ‘sanitation’ or ‘environmental sanitation’ or ‘hygiene’ and ‘empowerment’
Medline (via Ovid)	‘water’ or ‘sanitation’ or ‘hygiene’ and ‘empowerment’ or ‘power (psychology)’
Global Health (via Ovid)	‘water’ or ‘sanitation’ or ‘hygiene’ and ‘empowerment’

Selection criteria and screening

Peer-reviewed studies on empowerment within the WASH sector published in English were selected for the review. Articles were included without methodological restriction. We did not exclude any paper based on the date of publication or the country of publication. Removing methodological restrictions was particularly important for identifying a wide range of evidence related to empowerment indicators. Papers that were focused solely on empowerment in health promotion interventions without reference to WASH were excluded (for example, Lindacher et al. 2018).

Data management and extraction

All the articles were saved on a folder and charted using a Word document. The papers were screened sequentially in three stages (titles, abstracts, and full texts) by two researchers using the inclusion criteria discussed above. Disagreements were resolved by consensus. The following data were obtained from each article: authors, study location, study objective, study method, and empowerment dimensions.

RESULTS

From a total of 360 studies identified, 40 duplicates were removed. After the screening of the titles, 235 were excluded. This was followed by screening the abstracts of the remaining 85 studies after which 59 studies were excluded. Finally, the full texts of 26 studies were screened and 16 studies were excluded. Studies regarding empowerment in clinical environments were excluded at

this stage because there are existing reviews on empowerment in clinical environments (e.g. McGuckin & Govednik 2013). A final sample of 10 peer-reviewed articles met the inclusion criteria. Leahy *et al.* (2017), Leder *et al.* (2017), and Abu *et al.* (2019) were added after scanning reference lists of included studies and soliciting expert advice. These additions yielded a final sample of 13 peer-reviewed articles. A summary of the screening process is shown in an adapted version of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram (Figure 2).

Characteristics of the included studies

The final 13 studies employed a broad variety of study designs and data collection methods, including quantitative,

qualitative, and mixed-method studies. The majority (seven) of the studies were conducted in Africa, specifically in Kenya, Tanzania, South Africa, and Zimbabwe. The remaining six studies were conducted in the US, Bangladesh, India, Nepal, Vietnam, and the Marshall Islands.

With regard to themes explored, five studies focused on access to water and water safety (Hasan *et al.* 2011; Brinkman *et al.* 2012; Goodman *et al.* 2016; Leahy *et al.* 2017; Leder *et al.* 2017), two studies focused on sanitation (Smith *et al.* 2004; Welie & Romijn 2017), three studies explored water, sanitation and hygiene (Ali & Stevens 2009; Kema *et al.* 2012; Abu *et al.* 2019), two studies examined sanitation and hygiene (Waterkeyn & Cairncross 2005; Hetherington *et al.* 2017), and one study focused on water and sanitation (Durgaprasad & Sivaram 2007). Four studies specifically emphasized women's access to WASH and empowerment

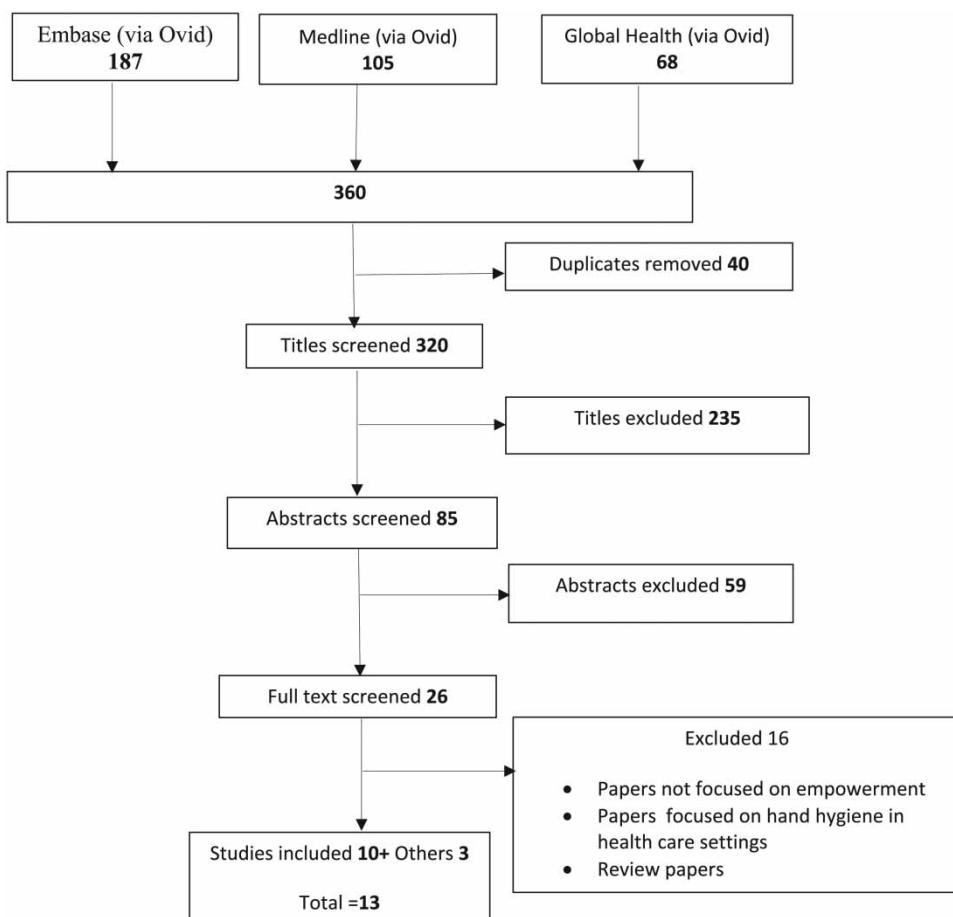


Figure 2 | Preferred reporting items for scoping reviews flow diagram: the screening process.

(Smith *et al.* 2004; Leahy *et al.* 2017; Leder *et al.* 2017; Abu *et al.* 2019). A summary of the charted data is presented in Appendix 1 in Supplementary Materials.

Summary of empowerment dimensions

Five key interrelated dimensions of empowerment in the WASH sector emerged across the 13 studies: access to information, participation, capacity building, leadership and accountability, and decision-making and inclusiveness. Most of the studies identified multiple dimensions of empowerment, though none of them captured all five key dimensions. We present a summary of these dimensions and then describe the levels of analysis used (e.g. individual, household, and community). The dimensions of empowerment were generated inductively by merging indicators of empowerment identified in the review into broader groups based on their conceptual similarities and the theoretical framework.

Access to information

Access to WASH information was identified as a dimension of empowerment in nine studies (Smith *et al.* 2004; Waterkeyn & Cairncross 2005; Durgaprasad & Sivaram 2007; Hasan *et al.* 2011; Brinkman *et al.* 2012; Kema *et al.* 2012; Goodman *et al.* 2016; Hetherington *et al.* 2017; Welie & Romijn 2017). Access to information comprised of activities such as knowledge sharing, awareness creation, and information dissemination. Laverack & Wallerstein (2001) suggest that sufficient knowledge and information regarding risks and actionable steps can help ensure collective action around safe WASH practices. Principal avenues and means for sharing information included community forums, community theater groups, village health days, workshops, and house-to-house visits (Waterkeyn & Cairncross 2005; Hasan *et al.* 2011; Kema *et al.* 2012; Hetherington *et al.* 2017). Some studies found that information sharing between community members significantly improved awareness and improved WASH practices (Smith *et al.* 2004; Waterkeyn & Cairncross 2005; Hasan *et al.* 2011). The ability to choose a type of water or sanitation facility that is safe, acceptable, affordable, and reliable depends on access information and education. While access to information is an

essential dimension of empowerment in WASH, issues such as inadequate communication and transportation inhibit effective information sharing, particularly when delivering interventions in rural and remote settings (Kema *et al.* 2012; Fogde *et al.* 2013).

Participation

Nine studies emphasized participation as a critical dimension of empowerment (Waterkeyn & Cairncross 2005; Durgaprasad & Sivaram 2007; Ali & Stevens 2009; Kema *et al.* 2012; Hetherington *et al.* 2017). Participation involved activities such as community engagement, partnerships, and involvement in the design and governance of WASH projects. Most of the studies argued that participation could empower communities to become equal partners in WASH interventions and enable communities to jointly design and own WASH services (Smith *et al.* 2004; Ali & Stevens 2009). For example, a study by Ali & Stevens (2009) in Faridpur, Bangladesh, demonstrates how the participatory process led to jointly prepared WASH budgets and plans between community members, municipalities, and other stakeholders. Other forms of participation included collective needs assessment and planning that were used to express opinions, needs, and ideas for addressing WASH challenges (Smith *et al.* 2004; Durgaprasad & Sivaram 2007; Ali & Stevens 2009; Kema *et al.* 2012).

Capacity building

Capacity building was identified in eight studies (Durgaprasad & Sivaram 2007; Ali & Stevens 2009; Hasan *et al.* 2011; Brinkman *et al.* 2012; Kema *et al.* 2012; Hetherington *et al.* 2017; Leder *et al.* 2017; Welie & Romijn 2017). Capacity building referred to the leveraging of human capital, organizational resources, and social capital to solve collective problems and improve or maintain well-being (Brinkman *et al.* 2012). In some of the studies, a greater emphasis was placed on improving WASH knowledge and training to enable community members appreciate local WASH challenges and take steps to address them (Kema *et al.* 2012; Hetherington *et al.* 2017). For instance, Kema *et al.* (2012) found that training key community artisans with requisite problem-solving skills to support operation,

maintenance, and repairs of water and sanitation facilities resulted in improved basic water and sanitation services.

Leadership and accountability

Leadership and accountability were identified in four studies (Smith *et al.* 2004; Durgaprasad & Sivaram 2007; Hetherington *et al.* 2017; Abu *et al.* 2019). These four studies specifically focused on encouraging people to become active participants in WASH programming within their communities. Some studies suggest that when local citizens and leaders agree on WASH challenges, it becomes easier to solve issues through community-led initiatives (Smith *et al.* 2004; Brinkman *et al.* 2012). For example, Durgaprasad & Sivaram (2007) showed that when authorities are committed and transparent in their communication around WASH, community members become willing to contribute resources toward the provision and maintenance of WASH services.

Decision-making

Decision-making is a crucial dimension of empowerment that exists in most empowerment frameworks. Inclusive decision-making was captured in the form of collective planning, participation, and opinion sharing in WASH-related decisions. Decision-making can be considered as a component of empowerment as well as an outcome of empowerment (Ali & Stevens 2009). It is considered as a process of empowerment when individuals, including women, make inputs into household and community water and sanitation planning issues or the resolution of WASH problems. Decision-making can be an outcome when WASH interventions amplify or create avenues to incorporate the voices of individuals and households. Ali & Stevens (2009) argued that communities do not have an opportunity to express their views when local external bodies make decisions. As a result, services do not sometimes meet their needs and are not appropriately maintained and eventually have a minimal impact.

On the other hand, better outcomes are achieved when those who face poor WASH access are involved in the decision-making process (Ali & Stevens 2009; Leahy *et al.* 2017; Leder *et al.* 2017). For example, in their study of

integrated approaches to promoting sanitation in Faridpur, Bangladesh, Ali & Stevens (2009) indicated that community involvement in decision-making included women's representation as well as listening to the needs of disabled persons. This led to the allocation of more WASH resources on the basis of needs identified by the target beneficiaries. Decision-making also enhances agency as those who face WASH risks are able to make purposeful choices in finding solutions to their WASH problems.

Women's empowerment in WASH

Four papers specifically addressed women's access to WASH and empowerment (Smith *et al.* 2004; Leahy *et al.* 2017; Leder *et al.* 2017; Abu *et al.* 2019). Decision-making, self-efficacy, capacity building, participation, leadership, knowledge, and information were captured as dimensions that empower women. For example, Leahy *et al.* (2017) found that equipping women with WASH-specific information and knowledge, particularly technical knowledge, contributed to them having a voice in decision-making in homes as well as communities. Smith *et al.* (2004) also found that project participation by Zulu and Xhosa women empowered them and provided an opportunity for them to articulate community needs. The limited number of studies on women's empowerment reflects the dearth of empirical evidence around gender equity within the WASH sector and is one of the significant gaps identified by this review.

Level of analysis

Empowerment was analyzed at three main levels: individual, household, and community levels. Six studies assessed WASH empowerment outcomes at the community level (Durgaprasad & Sivaram 2007; Ali & Stevens 2009; Brinkman *et al.* 2012; Kema *et al.* 2012; Abu *et al.* 2019; Welie & Romijn 2017). Two studies focused on how WASH programs promote empowerment at the individual level (Smith *et al.* 2004; Waterkeyn & Cairncross 2005). One study analyzed issues of WASH empowerment at the household level by investigating how households could be empowered through safe water practices (Goodman *et al.* 2016). Hetherington *et al.* (2017) focused on both individual

and household levels, while three studies focused on household and community levels (Hasan *et al.* 2011; Leahy *et al.* 2017; Leder *et al.* 2017). The limited number of individual and household-level analyses contributes to a lack of understanding of gender-specific empowerment obstacles as studies aggregated at the community and other higher levels can fail to unpack gender inequalities (Chant 2008). Further, the limited number of household-level studies emphasizes the need for empirical studies that examine the role of intra-household forms of resource and agency in promoting empowerment and WASH outcomes.

DISCUSSION

Socially marginalized groups disproportionately face negative impacts of poor WASH access (Bisung & Elliott 2017). Reducing these impacts is a dominant objective of WASH interventions, and empowerment is increasingly being recognized as a critical part of these interventions. However, there is little empirical evidence on how to promote empowerment or evaluate WASH interventions based on empowerment outcomes. This review summarizes the evidence related to empowerment in the WASH sector. The review included studies from Kenya, Zimbabwe, South Africa, Tanzania, USA, Bangladesh, Marshall Islands, India, and Mexico. A majority of the studies were conducted in Africa with a focus on Southern and Eastern Africa. The dearth of studies suggests both a greater need for studies on empowerment in the WASH sector in general and contextually relevant studies that focus on empowerment in different regions.

This review identified five key interrelated empowerment dimensions that may assist in the development of empowerment indicators and measures as well as contribute to theory building. Many of these dimensions are not only fundamental to the process of empowerment in the WASH sector but have been recognized in other sectors, including child health and agriculture (Alkire *et al.* 2013). Access to information was a central dimension of empowerment that was reported by the majority (nine) of the studies. Interestingly, in spite of the dominant role of modern sources of information such as television and radio, information sharing and communicating different WASH messages were

done through community forums, community theater groups, workshops, classrooms, village health days, and house-to-house visits. These community-based interactions could also contribute to achieving other empowerment dimensions (e.g. capacity building and decision-making). Although information is an important resource, having access to information does not result in empowerment if an individual cannot make choices toward the realization of goals. For example, an individual may receive information or education on the best source of drinking water that is safe, affordable, and reliable, but without the ability to choose a readily available source, empowerment may not be achieved.

Figure 3 conceptualizes empowerment based on Kabeer's framework and results from this review. Participation helps to build confidence, promotes ownership, and enhances involvement in the decision-making process (Imparato & Ruster 2003). Participation occurs on a spectrum, from merely being present at gatherings to active engagement and contribution to agenda setting (Cornwall 2008). Thus, the degree of involvement is relevant for determining the level of empowerment though the studies reviewed did not discuss the nuances associated with the spectrum of participation. Participation is also closely related to possibilities and opportunities for decision-making as well as leadership. For example, decision-making could involve situations where individuals, including women, and marginalized individuals or communities through collective efforts have substantive input into water and sanitation planning decisions.

It is acknowledged that empowerment in one dimension may not necessarily be an end in itself but interact with other dimensions to lead to empowerment outcomes (Narayan 2002; Mahmud *et al.* 2012). Thus, empowerment is experienced from the interaction between resources and agency leading to WASH achievement. From Figure 3, WASH outcomes are both a source and an outcome of empowerment. Such WASH outcomes include improved access to safe drinking water and sanitation, reduction in water-related diseases, healthcare savings, adequate time for engaging in economic activities for income, etc. These outcomes represent and can enable the realization of an individual's potential for choice. Interactions between the different dimensions of empowerment do not mean that

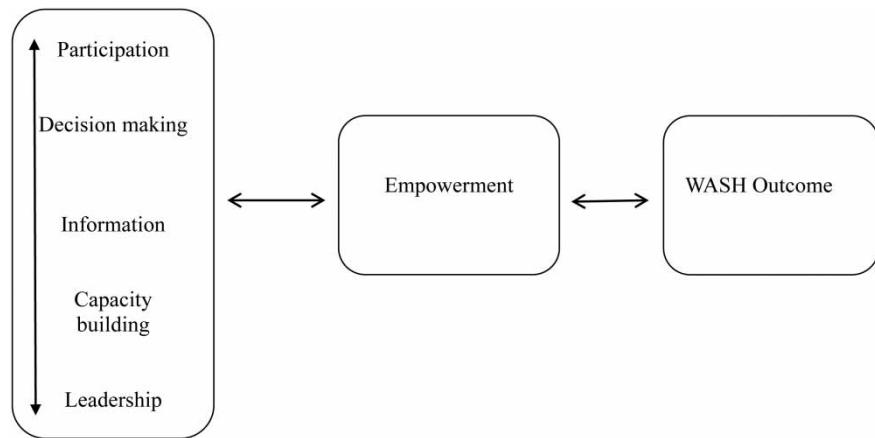


Figure 3 | Adopted from Kabeer (1999).

the development of an intervention to promote empowerment focusing on a particular dimension will give rise to the other dimensions.

While the measurement of empowerment spans several decades, there remains limited knowledge and considerable scope for investigating the role empowerment plays in determining safe WASH outcomes (Taukobong *et al.* 2016; Gimelli *et al.* 2018). For example, none of the studies measured empowerment in any quantifiable way or used specific quantitative dimensions of empowerment. While the qualitative assessment is important due to the culturally specific nature of empowerment, quantitative measures can contribute to effective evaluation and communication of findings. For example, a study conducted in East Africa by Miedema *et al.* (2018) demonstrates the use of Demographic and Health Survey data for comparing relationships between human or social assets, women's gendered attitudes and beliefs (intrinsic agency), and the extent of women's participation in household decision-making across five East African countries.

Following the formulation of the SDGs, debates on water and sanitation security have emphasized the need to use more inclusive perspectives to consider inequities that may not be addressed through only infrastructure-related measures (Aleixo *et al.* 2018). This review shows that the lack of studies that address individual and household levels of WASH empowerment and gender inequity is one of the most significant gaps. We argue that a focus on intra-household and individual level analysis would increase

the understanding of empowerment in the WASH sector. This is particularly important for understanding women's empowerment and power relations between men and women within a household which may be hidden in data that is not disaggregated by sex (Mosedale 2005). WASH interventions can contribute to change in gender relations in a broader society if practitioners move beyond a narrow focus on the provision of infrastructure and include a greater emphasis on social and cultural relations within gender mainstreaming. To achieve the SDG's universal coverage target for WASH, programs must recognize and empower the most disadvantaged groups (Routray *et al.* 2017).

There are some strengths and limitations of this review worth acknowledging. Regarding strengths, the use of broad search terms as recommended by Arksey & O'Malley (2005) ensured an extensive search of the literature. Further, including both qualitative and quantitative studies added both breadth and depth to the evidence presented. With regard to the limitations of this study, we did not perform a quality assessment of the individual studies. Also, the included articles were restricted to those published in English and in peer-reviewed journals. This may have led to the exclusion of some important studies published in other languages. In addition, studies that examined dimensions of empowerment without using the term empowerment may not be captured through our search (for example, Hirai *et al.* 2018). Finally, the heterogeneity in study designs limited our ability to make adequate cross-study comparisons.

CONCLUSION

The findings of this literature review suggest that empowerment has a role in promoting equitable WASH services. The findings identified multiple but related dimensions of empowerment as well as multiple levels for analyzing or promoting empowerment. The findings also show that empowerment can be both a cause and an outcome of successful gender-sensitive WASH programs. The limited number of studies identified, despite the importance of gender relations in the WASH domain is an important gap worth addressing. In particular, more research is needed to understand the processes of empowerment at the household level where important decisions are made. A greater understanding of dimensions of empowerment in different cultural contexts will inform strengthening of WASH interventions to achieve gender and social equality outcomes and improve tracking of progress toward universal access over time.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this paper is available online at <https://dx.doi.org/10.2166/washdev.2019.077>.

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REFERENCES

- Abu, T. Z., Bisung, E. & Elliott, S. J. 2019 *What if your husband doesn't feel the pressure? An exploration of women's involvement in WaSH decision making in Nyanchwa, Kenya.*
- International Journal of Environmental Research and Public Health* **16** (10), 1763.
- Aleixo, B., Pena, J. L., Heller, L. & Rezende, S. 2018 *Infrastructure is a necessary but insufficient condition to eliminate inequalities in access to water: research of a rural community intervention in northeast Brazil.* *Science of the Total Environment* **652**, 1445–1455.
- Ali, M. & Stevens, L. 2009 *Integrated approaches to promoting sanitation : a case study of Faridpur, Bangladesh.* *Desalination* **248** (1–3), 1–7.
- Alkire, S., Meinzen-Dick, R., Peterman, A., Quisumbing, A. R., Seymour, G. & Vaz, A. 2013 *Women's empowerment in agriculture index.* *World Development* **52**, 71–91.
- Alsop, R., Bertelsen, M. & Holland, J. 2006 *Empowerment in Practice: From Analysis to Implementation. Directions in Development.* World Bank, Washington, DC.
- Arksey, H. & O'Malley, L. 2005 *Scoping studies: towards a methodological framework.* *International Journal Social Research Methodology* **8** (1), 19–32.
- Bakker, L. & Van Brakel, W. H. 2012 *Empowerment assessment tools in people with disabilities in developing countries. A systematic literature review empowerment assessment tools in people with disabilities in developing countries. A systematic literature review.* *Leprosy Review* **83**, 129–153.
- Bisung, E. & Elliott, S. J. 2017 *Psychosocial impacts of the lack of access to water and sanitation in low- and middle-income countries: a scoping review.* *Journal of Water and Health* **15** (1), 17–30.
- Brinkman, E., Seekamp, E., Davenport, M. A. & Brehm, J. M. 2012 *Community capacity for watershed conservation : a quantitative assessment of indicators and core dimensions.* *Environmental Management* **99** (6), 1–14, 1–12.
- Chant, S. 2008 *Women, girls and world poverty : empowerment, equality or essentialism?* *International Development Planning Review* **38** (1), 1–24.
- Cornwall, A. 2008 *Unpacking participation: models, meanings and practices.* *Community Development Journal* **43** (3), 269–283.
- Durgaprasad, P. & Sivaram, P. 2007 *Good governance and HRD: case studies of user managed safe drinking water and health projects in India.* *Asia-Pacific Journal of Rural Development* **17** (1), 95–112.
- Ewerling, F., Lynch, J. W., Victora, C. G., van Eerdewijk, A., Tyszler, M. & Barros, A. J. D. 2017 *The SWPER index for women's empowerment in Africa: development and validation of an index based on survey data.* *The Lancet Global Health* **5** (9), e916–e923.
- Fogde, M., Macario, L. & Carey, K. 2013 *The matter is not if, but when and where: the role of capacity development in disaster risk reduction aiming for a sustainable water supply and sanitation.* In: *The Role of Ecosystems in Disaster Risk Reduction* (F. G. Renaud, K. Sudmeier-Rieux & E. Marisol, eds.). United Nations University Press, Tokyo, pp. 270–290.

- Gimelli, F. M., Bos, J. M. & Rogers, B. C. 2018 *Fostering equity and wellbeing through water: a reinterpretation of the goal of securing access*. *World Development* **104**, 1–9.
- Goodman, M., Elliott, A., Gitari, S., Keiser, P. H. & Raimer-Goodman, L. A. 2016 *Improved water and household water purification practices among orphans and vulnerable children in a multi-sectoral empowerment program in Eastern province, Kenya*. *Journal of Water and Health* **14** (3), 513–527.
- Graham, J. P., Hirai, M. & Kim, S. S. 2016 *An analysis of water collection labor among women and children in 24 sub-Saharan African countries*. *PLoS One* **11** (6), e0155981.
- Harryson, L., Aléx, L. & Hammarström, A. 2016 ‘I have surely passed a limit, it is simply too much’: women’s and men’s experiences of stress and wellbeing when living within a process of housework resignation. *BMC Public Health* **16** (1), 224.
- Hasan, T. J., Hicking, A. & David, J. 2011 Empowering rural communities: simple water safety plans’. *Water Science Technology: Water Supply* **11** (3), 309–318.
- Hetherington, E., Eggers, M., Wamoyi, J., Hatfield, J., Manyama, M., Kutz, S. & Bastien, S. 2017 Participatory science and innovation for improved sanitation and hygiene: process and outcome evaluation of project SHINE, a school-based intervention in rural Tanzania. *BMC Public Health* **17** (1), 172.
- Hirai, M., Kelsey, A., Mattson, K., Cronin, A. A., Mukerji, S. & Graham, P. J. 2018 Determinants of toilet ownership among rural households in six eastern districts of Indonesia. *Journal of Water Sanitation and Hygiene for Development* **8** (3), 533–545.
- Imparato, I. & Ruster, J. 2003 *Slum Upgrading and Participation: Lessons From Latin America*. World Bank, Washington DC.
- Kabeer, N. 1999 Resources, agency, achievements: reflections on the measurement of women’s empowerment. *Development and Change* **30**, 435–464.
- Kabeer, N. 2005 Gender equality and women’s empowerment: a critical analysis of the third millennium development goal. *Gender and Development* **13** (1), 13–24.
- Kabeer, N. 2011 Between affiliation and autonomy : navigating pathways of women’s empowerment and gender justice in rural. *Development and Change* **42** (2), 499–528.
- Kema, K. M., Komwihangiro, J. & Kimaro, S. 2012 Supplement article project evaluation integrated community based child survival, reproductive health and water and sanitation program in Mkuranga district, Tanzania : a replicable model of good practices in community based health care. *Pan African Medical Journal* **13** (Suppl. 1), 1–7.
- Kevany, K. & Huisingsh, D. 2013 A review of progress in empowerment of women in rural water management decision-making processes. *Journal of Cleaner Production* **60**, 53–64.
- Laverack, G. 2007 Health promotion practice: building empowered communities. *Journal of Health Psychology* **13** (1), 8–9.
- Laverack, G. & Wallerstein, N. 2001 *Measuring community empowerment: a fresh look at organizational domains*. *Health Promotion International* **16** (2), 179–185.
- Leahy, C., Winterford, K., Nghiem, T., Kehler, J., Leong, L. & Willetts, J. 2017 Transforming gender relations through water, sanitation, and hygiene programming and monitoring in Vietnam. *Gender and Development* **25** (2), 283–301.
- Leder, S., Clement, F. & Karki, E. 2017 Reframing women’s empowerment in water security programs in western Nepal. *Gender and Development* **25** (2), 235–251.
- Lindacher, V., Curbach, J., Warrelmann, B., Brandstetter, S. & Loss, J. 2018 Evaluation of empowerment in health promotion interventions : a systematic review. *Evaluation & the Health Professions* **41** (3), 351–392.
- Mahmud, S., Shah, N. & Becker, S. 2012 *Measurement of women’s empowerment in rural Bangladesh*. *World Development* **40** (3), 610–619.
- Malhotra, A., Schuler, S. R. & Boender, C. 2002 *Measuring Women’s Empowerment as a Variable in International Development*. Gender and Development Group, The World Bank, Washington, DC.
- McGuckin, M. & Govednik, J. 2013 Patient empowerment and hand hygiene, 1997–2012. *Journal of Hospital Infection* **84**, 191–199.
- Mekonnen, M. & Hoekstra, A. Y. 2016 Four billion people facing severe water scarcity. *Science Advances* **2** (2), e1500323.
- Miedema, S. S., Haardörfer, R., Webb Girard, A. & Yount, K. M. 2018 Women’s empowerment in East Africa: development of a cross-country comparable measure. *World Development* **110**, 453–464.
- Mosedale, S. 2005 Policy arena assessing women’s empowerment: towards a conceptual framework. *Journal of International Development* **17**, 243–257.
- Narayan, D. 2002 *Empowerment and Poverty Reduction: A Sourcebook*. World Bank Publications, Washington, DC.
- Pham, M. T., Rajic, A., Greig, J. D., Sargeant, J. M., Papadopoulos, A. & McEwen, S. A. 2014 A scoping review of scoping reviews: advancing the approach and enhancing the consistency. *Research Synthesis Methods* **5** (4), 371–385.
- Reed, B., Coates, S. & Parry-Jones, S. 2007 *Infrastructure for All: Meeting the Needs of Both Men and Women in Development Projects – A Practical Guide for Engineers, Technicians and Project Managers*. WEDC, Loughborough University, Loughborough.
- Routray, P., Torondel, B., Clasen, T. & Schmidt, W. P. 2017 Women’s role in sanitation decision making in rural coastal Odisha, India. *PLoS One* **12** (5), e0178042.
- Schweitzer, R., Grayson, C. & Lockwood, H. 2014 *Mapping of Water, Sanitation and Hygiene Sustainability Tools*. Working Paper 10. IRC, Aguiconsult, The Hague.
- Sheuya, S. A. 2008 Improving the health and lives of people living in slums. *New York Academy of Sciences* **1136** (1), 298–306.
- Smith, M. A., Edwards, M. J. O. & Hara-murdock, P. O. 2004 Health promotion and disease prevention through sanitation

- education in South African Zulu and Xhosa women. *Journal of Transcultural Nursing* **15** (1), 62–68.
- Stevenson, E., Ambelu, A., Caruso, B., Tesfaye, Y. & Freeman, M. 2016 Community water improvement, household water insecurity, and women's psychological distress: an intervention and control study in Ethiopia. *PLoS One* **11** (4), 1–13.
- Sultana, F. 2011 Suffering for water, suffering from water: emotional geographies of resource access, control, and conflict. *Geoforum* **42** (2), 163–172.
- Sweetman, C. & Medland, L. 2017 Introduction: gender and water, sanitation and hygiene. *Gender and Development* **25** (2), 153–166.
- Taukobong, H. F. G., Kincaid, M. M., Levy, J. K., Bloom, S. S., Platt, J. L., Henry, S. K. & Darmstadt, G. L. 2016 Does addressing gender inequalities and empowering women and girls improve health and development program outcomes? *Health Policy and Planning* **31** (10), 1492–1514.
- UNICEF 2017 *Gender-Responsive Water, Sanitation and Hygiene: Key Elements for Effective WASH Programming*. UNICEF, New York.
- UNICEF and WHO 2017 *Progress on Drinking Water, Sanitation and Hygiene. 2017 Update and SDG Baselines*. World Health Organization/United Nations Children's Fund, New York.
- Waterkeyn, J. & Cairncross, S. 2005 Creating demand for sanitation and hygiene through community health clubs: a cost-effective intervention in two districts in Zimbabwe. *Social Science & Medicine* **61**, 1958–1970.
- Welie, M. J. & Romijn, H. A. 2017 NGOs fostering transitions towards sustainable urban sanitation in low-income countries: insights from transition management and development studies. *Environmental Science and Policy* **84**, 250–260.
- World Water Assessment Program (WWAP) 2015 *The United Nations World Water Development Report 2015: Water for a Sustainable World, Facts and Figures*. UN Water Report, p. 138.
- Wutich, A. 2009 Intrahousehold disparities in women and men's experiences of water insecurity and emotional distress in urban Bolivia. *Medical Anthropology Quarterly* **23** (4), 436–454.
- Zimmerman, M. A. 1995 Psychological empowerment: issue and illustrations. *American Journal of Community Psychology* **23** (5), 581–599.

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