Research Paper

When behavior change fails: evidence for building WASH strategies on existing motivations

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ABSTRACT

Despite increased efforts, an estimated 30–40% of rural drinking water initiatives in developing countries fail to provide sustainable solutions. The Sustainable Development Goal for water (SDG 6) challenges us to solve this problem to ensure availability and sustainable management of water and sanitation for all. In this paper, we explore one possible barrier to success: a potential misalignment between local and outside motivations. We address this problem by analyzing how strategies used to successfully ($n = 148$) and unsuccessfully ($n = 70$) deliver drinking water to rural areas align with known motivations of local stakeholders. As one tool and starting point, we use definitions in Maslow's theory of motivation to learn and share how to more consistently and successfully build comprehensive motivations into solutions. The results reveal that successful strategies rarely focus on physiological needs (2/148) and often focus on higher-level needs, including self-esteem (75/148), love and belonging (46/148), and safety (69/148). Successful strategies also typically address multiple needs and are designed to meet the actualization (fulfill potential) of both communities and donors. Unsuccessful strategies focus on needs of outside stakeholders above local stakeholders (46/70), fail to address higher-level or multiple needs, and/or unsuccessfully address existing needs.

Key words | behavior change, motivation, rural, sustainability, water

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INTRODUCTION

As the Sustainable Development Goals (SDGs) begin, we have the opportunity to both celebrate what has worked and challenge ourselves to do things better. The water, sanitation, and hygiene (WASH) sector has achieved great success in meeting the Millennium Development Goals (MDGs) for water – globally halving the number of people without improved access (WHO/UNICEF JMP 2015). However, we have also learned that there is a difference between improved access to hardware and improved health; an estimated 1 billion people still use unsafe water despite improved infrastructure (Onda *et al.* 2012; WHO/UNICEF JMP 2015). While the past MDGs may have been about increasing access to technology, the SDGs have the additional challenge of ensuring that improved access is sustainable access.

Currently an estimated 30–40% of development efforts to improve access to water still fail (are broken and/or unused) (Lockwood *et al.* 2010), which is similar to rates found 40 years ago (Imboden 1977). While there have been increasing efforts to address this issue – especially the financial and technical aspects (Shannon *et al.* 2008; Moriarty *et al.* 2010) – a review of recent WASH sustainability frameworks reveals the need to better understand, plan for, and address the social aspects of sustainability (Harvey 2013). Social in this context is defined as attributes of sustainability that center on the people and processes necessary to deliver

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services. Sustainability refers to whether or not systems continue to work over time (Abrams 1998) at an acceptable level of quality and quantity. The social dimensions of sustainability then focus on the people and processes, including motivations, necessary to enable hardware to function at acceptable levels and quantities over time.

Many past approaches to social sustainability have targeted behavior change – or solutions aimed at changing the habits of local stakeholders to achieve a pre-set objective. Research shows that these approaches have experienced difficulties in creating consistently sustainable results. One study finds that if success is defined as 'functional technology' or hardware (i.e., presence of toilets), success rates are 90%. However, the success rates drop to as low as 8% when including behavior change metrics such as hand-washing or the presence of soap (Tyndale-Biscoe *et al.* 2013). Past research shows that both hardware (physical infrastructure, technology) and software (knowledge, education, institutions) are needed to build sustainable WASH infrastructure (Kaminsky & Javernick-Will 2013). Specifically, studies have found that infrastructure alone does not guarantee the desire or motivation to adopt it (Whaley & Webster 2011), and that communicating non-health benefits should be encouraged to drive sustainable adoption. For example, Lagerkvist *et al.* (2014) found that health benefits are less important than other measures of individual well-being for sanitation motivation.

The literature suggests that one potential reason for failed efforts may be a misalignment between the motivations of local stakeholders and development professionals. While health may be the primary motivator for professionals, it may not be for local stakeholders (Curtis *et al.* 2009). For example, sector discourse suggests that motivations such as status, convenience, or conforming with social norms are powerful motivators in WASH (Kaminsky & Javernick-Will 2015). However, we lack theory to consistently and fully understand what local motivations are. This negatively impacts demand generation and leaves us without the knowledge needed to design strategies that consistently and effectively address the comprehensive motivations of local stakeholders. We contend learning how to build solid motivation infrastructure will contribute to the sustainability of future solutions, including existing motivation-based approaches.

One case in point is Community Total-Led Sanitation (CLTS). While this approach does target some local motivations to trigger behavior change (i.e., esteem through shame), the relatively low success rates and wide variation between success rates demonstrates the need for further research to close the gap. For example, a major study comparing CLTS success rates across 18 West African countries found an average 17.16% success rate in creating open defecation free (ODF) communities (UNICEF WCARO 2011). This study also shows a wide range of success using CLTS, with the top three countries reporting a success rate of 37–65% and the lowest five countries having a success rate of 0%. These results illustrate that motivational strategies can be effective, but more research is needed to learn how to make them consistently effective.

Sanitation marketing – another approach that targets user motivation – has experienced promising success but also leaves room for learning how to increase impact and replicate results. One study done by the Water and Sanitation Program found an average 30.57% success rate across seven countries (O'Connell 2014). While studies show that the sustainability of CLTS impact (number of ODF communities) may decline over time, the evidence suggests that the impact of sanitation marketing may grow in subsequent years (Sijbesma *et al.* 2010). This same study found that using sanitation marketing, access to sanitary toilets increased from 15 to 44% in three years and to 59% in the following two years compared to no change in communes using other approaches (2010). We hypothesize that the scaling effect may be in part to sanitation marketing's focus on other motivations, such as creating jobs for local entrepreneurs (economic security), as well as focusing on the aspirational desires (local actualization) of local people in their products (Pedi *et al.* 2014). These studies show that the motivations we target and the processes we use to address them matter in creating long-term sustainability. They also suggest that we may be able to increase the consistency of our impact by better understanding how to build solid motivation infrastructure into our solutions and in different contexts.

To build on this evidence and contribute to sector discussions, we use Maslow's theory of motivation (Maslow 1943) as a starting point and tool for learning how to more consistently align the motivations of service providers and infrastructure users. While Maslow's theory has been widely applied, with studies in fields as diverse as nursing (Benson & Dundis 2003), business (Hersey *et al.* 2000), and technology (Bailey

& Pownell 1998), it has not been explored by the WASH sector (Rosenquist & Emilia 2005). A search of the literature yielded only one article that leverages Maslow's theory of motivation for sanitation provision (Rosenquist & Emilia 2005); that paper calls for additional research using Maslow's theory in WASH. Therefore, and in response to this call, our specific objectives are to discover insights that will help build a more solid foundation for sustainable rural water solutions through: (1) learning how successful and unsuccessful strategies in the rural water sector align with motivation, using Maslow's theory of motivation as an empirically based starting point; and (2) share practical examples and strategies organizations can use to more consistently design solutions that align with comprehensive local motivations.

BACKGROUND

The theory

Maslow's theory of human motivation (1943) states that people have five basic needs that are common to all people: physiological, safety, love and belonging, self-esteem, and self-actualization. Each of these needs is pre-potent, meaning they build upon each other. For example, according to Maslow (1943), a person must satisfy physiological needs before addressing other needs. In this paper, we refer to the needs after physiological needs as *higher-level needs* or *higher-level motivations*, not because they are more or less important but because, according to Maslow, they come after something else. There are many more or less evidence-based adaptations of Maslow's theory. In this paper, we use Maslow's original definitions and applied definitions in Table 1 (Maslow 1943) to explore how to design approaches that are a better fit for users' motivation for rural water supply.

Main critiques

Over the past 70 years, Maslow's theory (1943) has been well-studied and critiqued. In particular, authors have questioned the number and types of needs Maslow proposes (Alderfer 1969), the order of needs (Gawel 1997), and his empirical evidence (Wahba & Bridwell 1976; Yalch & Brunel 1996). Many of these critiques stem from the fact that Maslow purposively sampled the healthiest 1% of the population in order to base his theory on healthy individuals rather than the sick. However, it raises the question of how applicable the results are to other populations.

Recent studies have devised ways to more accurately test the number, type, and order of needs Maslow proposes. One recent effort found significant statistical evidence to support Maslow's theory of pre-potency as well as the individual needs he describes (Taormina & Gao 2013). Similarly, other studies have examined whether or not Maslow's theory holds true in other cultures, a topic particularly relevant for international development. For example, Nevis (1983) proposes that in China, love and belonging should fit on the bottom of the pyramid rather than physiology, but the rest of the categories remain similar. Another author points out the need to take into account the differences for collectivist vs. individualist societies (Yang 2002).

In summary, there is a need to investigate further how Maslow's hierarchy of needs applies in different cultures and contexts. However, as Maslow contends, there are certain traits common to human beings that transcend cultures. Maslow's framework provides an empirically grounded method and established reference point to begin learning how rural water solutions align or not with local motivations.

METHODS

Data collection

The results presented here use a data-set from a larger study (Marshall 2015) that examined characteristics of efforts that both succeeded ($n = 148$) and failed ($n = 70$) in delivering safe drinking water to rural areas. These characteristics, herein referred to as 'strategies', were obtained through line-by-line coding of over 500 pages of examples of efforts that failed and succeeded in delivering rural drinking water. The examples were given by 22 participant interviews from leaders and practitioners in the WASH sector. These leaders were purposively selected based on their experience in delivering rural water, diversity in approach to creating socially sustainable solutions, and/or leadership role in the WASH sector. Further definitions are rescinded to protect confidentiality.

Table 1 | Maslow's theory of motivation (1943) – definitions of motivations and applied coding dictionary for sustainable rural water delivery

Motivation	WASH related definitions from Maslow's theory	Examples of applications in WASH (from coding dictionary)
Local self-actualization	Helping local people become who they really want to be; fulfill potential.	Strategies that make life more convenient; looks at bigger picture – not just health and water; focuses on development of local people – including capacity building; focuses on long-term development – often at expense of immediate short-term outcomes.
Outside self-actualization	Helping outside organization become who they really want to be; fulfill potential.	Baseline measurement of actualization – every organization has some purpose/mission they are trying to fulfill. For purposes of coding, any mention of water and/or health in a quote was coded as outside actualization.
Excessive outside actualization	Focusing on outside organization's needs at expense of long-term results/local needs.	Evidence that long-term results or fulfillment of local needs fails or suffers as a result of excessive focus on: outside interests – (budget, schedule); narrow approaches that focus on own goals and expertise – e.g., WASH only, health only, engineering only approaches; short-cuts to achieve things cheaper, faster, easier; short-term focus.
Self-esteem	Stable, firmly based high evaluation of oneself.	Respect – listening to local priorities, preferences; buying, hiring, and building local. Reputation – pressure on providers to succeed/not make mistakes and desire for good quality items and services.
Love and belonging	Connection to people through loving relationships and belonging to a group.	'A place in his/her group' – belonging, the need and desire to be part of a group – connected, i.e., involving local people in decisions. Strategies that help people stay connected and foster loving, meaningful relationships. Takes into consideration issues like community dynamics.
Safety and security	Preference for a predictable orderly world.	Formal and informal research – data, monitoring, evaluations. Preference for using familiar methods. Freedom from division, injustice, and inequality.
Physiology	Homeostasis (balance) of chemicals in blood.	Thirst, water quantity. Not water quality.

Semi-structured interviews (Spradley 1979) were conducted in person at the University of North Carolina Water and Health Conference in October 2013, as well as via Skype through February 2014. Interviews lasted an average of 1–1.5 hours, and informed consent was obtained prior to each interview. During each interview, participants were asked to share an in-depth example of an effort that was successful and another that was not. Success was originally defined as 80% of systems/services functioning and in use evidenced by documented monitoring data for at least five years. Given the lack of monitoring data available in the sector, even among leaders, at the time the interviews were conducted, we allowed participants to share examples of systems or solutions that failed or succeeded based on their experience. We acknowledge the limitations that come with self-reporting, and we agree that future research should use aggregated, long-term monitoring data when it becomes available. In the interim, we felt that there was still value in learning from the insights and experiences of leaders in the sector. As a result, the best available data and methods (qualitative analysis) were used to accomplish our primary goal: to learn and share in-depth insights on how to improve the social sustainability of rural water efforts.

All interviews were recorded, transcribed verbatim and coded (Miles & Huberman 1994; Auerbach & Silverstein 2003; Saldaña 2009) using ©NVivo10 qualitative software. Each interview was iteratively coded according to what worked or did not work in participants' specific examples, yielding the set of 148 strategies found in successful efforts and 70 strategies in efforts that failed.

Data analysis

The successful strategies ($n = 148$) and unsuccessful strategies ($n = 70$) were then individually compared to a coding dictionary and analyzed to discover how they aligned or

not with basic motivations of local stakeholders, as defined by Maslow (1943, Table 1). In our results, we use *motivation* rather than *need* as we discuss our results and the items in Maslow's framework. Table 1 lists examples from the written coding dictionary, used to improve research validity (Bernard & Ryan 2009), as the coding dictionary is too large to replicate in full here. The coding dictionary was formed by first listing definitions for each of the five basic motivations directly from Maslow's theory (1943) and then by applying these definitions to examples interview participants gave to deliver rural water services. Using the coding dictionary, we determined whether or not each individual strategy addressed a physiological, safety, love and belonging, self-esteem, and/or self-actualization motivation. For example, the safety and security code is defined in part as a desire for an orderly world. An example from our data were cases when people prefer to not a use a new technology – preferring instead to continue doing what they are familiar with rather than changing to something new.

As Maslow's theory is based on the individual, we performed additional analysis to make it useful for stakeholders in rural water. Specifically, we assessed whether strategies that failed or succeeded focused on the actualization of local stakeholders (local governments, communities) versus outside stakeholders (development organizations, funders, etc.). These categories are called *local actualization* and *outside actualization*, respectively, in Table 1 and the results. We further split outside actualization into two categories: (1) *baseline outside actualization*, coded when the data mention improving health or providing water as part of fulfilling an organizational mission; and (2) *excessive outside actualization*, coded when the data include evidence of compromising long-term results by focusing on external motivations such as short cuts in schedule or resources.

We used many techniques to ensure the reliability of results. Any strategy that did not clearly fall into the definitions in the coding dictionary was given the code 'high inference'. Each strategy was coded to each level in Maslow's hierarchy and recorded with a written definition from the coding dictionary for as to why it aligned or not with a particular motivation. Multiple iterations of coding were conducted to ensure strategies were being coded consistently throughout. Finally, two inter-coder reliability checks were performed. We achieved 92.5% and 95% inter-coder initial reliability rates for a 10% sample of the strategies. After this check, all identified discrepancies throughout the dataset were recoded as needed.

There are important limitations to this analysis. The first is that there are many theories of motivation in addition to Maslow's, and future research should investigate their potential to further contribute. Another limitation of this analysis is that Maslow's hierarchy must be understood as co-existing and competing with other and potentially confounding variables. For example, motivations are dynamic as an individual has multiple motivations that vary over time. Future research should examine how we might design solutions that account for these changing and competing motivations.

RESULTS AND DISCUSSION

In this section we present the data and emergent patterns. We find that sustainable rural water strategies are not built on health motivations but rather focus on 'higher-level' motivations (higher according to Maslow's theory of pre-potency and the levels of his hierarchy) such as self-esteem (respect) and actualization (the capacity to fulfill potential). The data also reveal that successful strategies were more likely to address multiple motivations and to meet the motivations of all stakeholders.

Successful strategies

Figure 1 illustrates how successful strategies align with motivation according to Maslow's theory. The themes that emerge from the data challenge the assumption of motivational pre-potency by showing the importance of both higher-level and multiple motivations, and provide useful insights for designing more sustainable approaches to rural water that rigorously consider users' motivations.

Successful strategies do not focus primarily on health or water quality

Only 2/148 successful strategies (1.4%) focused on physiological motivations using Maslow's definition (water

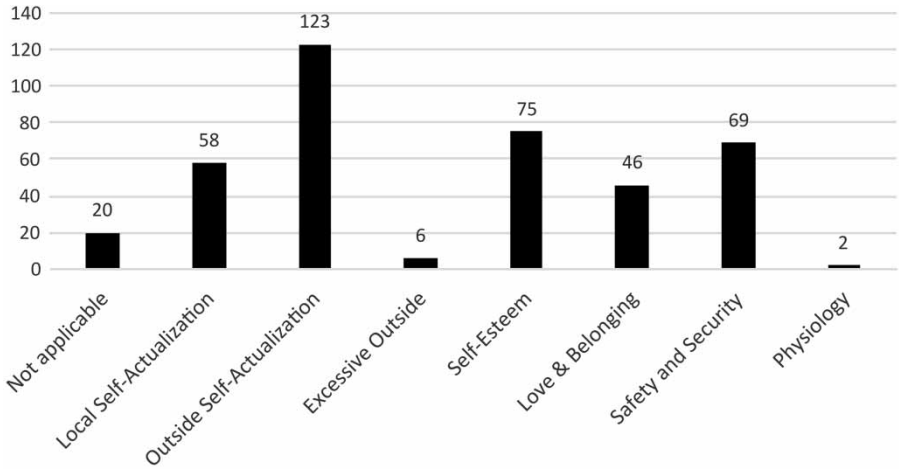

Figure 1 | How successful strategies in WASH align with motivation according to Maslow's theory.

scarcity). This finding is important because an important motivator for development organizations in rural water provision is often community health. Our data suggest this is not an effective motivator at the community level. While Maslow's theory states physiological needs are the most basic motivation, the results of this study show there may be a fundamental misinterpretation of what is included in this category. A closer examination reveals that Maslow defines physiological needs as the need to maintain homeostatic balance of basic chemicals in the blood, such as sodium, sugar, and water. Maslow's only reference to water in his theory is 'water content of the blood' (1943), which is more in line with water scarcity than water quality. Poor water quality can certainly lead to dehydration due to diarrheal disease. However, decision theory tells us that people often discount impacts that are in the future, and also discount impacts that are uncertain (Hammond 2000). In other words, while the outcomes of water scarcity and poor water quality may be the same, these two factors motivate people differently. Satisfying thirst is immediate and certain, while diarrhea is in the future and may or may not be linked to any particular cup of water. In other words, we argue that in terms of human motivation, these two facets of water services must be understood differently. This suggests that in order to motivate sustainable water supply, a greater emphasis should be placed on water quantity and ease of access. Development organizations and funders are, of course, also interested in providing good quality water; however, the data suggest that targeting users' desire for quantity and ease of access may most effectively motivate users to switch to better quality sources – potentially increasing the chances of achieving the desired health impact.

Successful strategies focus on higher-level motivations

The data show that a high percentage of successful strategies focused on higher-level motivations: 50.7% (75 out of 148) on self-esteem, 31.1% (46 out of 148) on love and belonging, and 46.6% (69 out of 148) on safety and security (strategies may focus on more than one motivation type). In contrast, and as shown in Figure 2, unsuccessful strategies often neglected to focus on higher-level motivations. These results suggest that efforts to deliver rural water services should design strategies that target higher-level user motivations like the ones listed above.

These results are consistent with theory. In addition to his idea of pre-potency, Maslow also proposed that people have an innate drive to continue reaching higher levels on the pyramid (Maslow 1943). From this lens, it is not surprising that the data show users pursue higher-level motivations. Similarly, economic theory has long recognized that people do not wait for a perfect solution; instead, they *satisfice* (Simon 1972), or accept an available option as satisfactory rather than waiting for the perfect solution. As such, and as observed in the data, lower level physiological motivations may not be met according to donor standards before people satisfice and become motivated by higher-

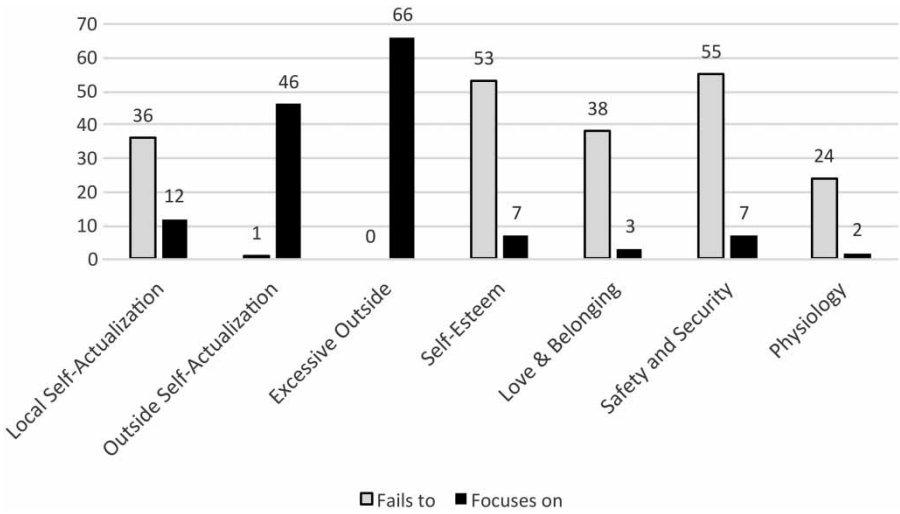

Figure 2 | How unsuccessful strategies align with motivation according to Maslow's theory.

level motivations. Future work should further explore satisficing for the rural water sector.

Exemplifying the use of strategies that target higher-level motivations, many of the successful strategies participants described were designed to meet the economic motivations (safety and security) of local stakeholders while also providing water services. One participant found a way to combine water committees into WASH Associations, whose combined fees were able to provide many paid positions for local women. Another participant trained local masons to build and repair wells, thus providing them a livelihood while increasing the local capacity to maintain water infrastructure. Yet another participant created clubs that provided regular social gatherings for people, thus meeting people's motivation for love and belonging: '*It's incredibly popular…. They get dressed up, they walk miles to go to the club meeting*'. More research is needed in order to learn how to consistently design strategies that meet the higher-level motivations of stakeholders while delivering rural water services.

Successful strategies are designed to meet the multiple goals and motivations of all stakeholders

Among the 148 successful strategies, the vast majority (123, or 83.1%) reported a baseline level of outside actualization, such as achieving organizational missions by trying to improve community health through rural water infrastructure. However, just 4.1% (6 out of 148) of the successful strategies had evidence of focusing on excessive outside actualization, such as strategies with evidence of taking short-cuts, prioritizing outside interests (schedule, budget), or having a short-term focus. These results suggest that it is important for outside stakeholders to have a certain level of actualization – they need to accomplish their mission of improving community health to be organizationally sustainable themselves (Meyer & Rowan 1977). However, an excessive focus on their own actualization undermines actualization for all stakeholders.

In a complementary point, 39.2% (58 out of 148) of successful strategies focused on the actualization of local people. For example, one organization created a model that capitalized on local actualization to accomplish their mission of providing safe water. This organization recognized that part of a politician's actualization is re-election, which is more likely to occur if communities have access to water: '*[The Mayors] basically know they have to deliver [water] and if they don't, they're going to be out*'. In this example, the development organization helped the mayors meet their need for re-election by delivering safe water: '*[This strategy] is actually right in their wheelhouse. They're showing they're able to get money from the Ministry of Finance, which other mayors are very jealous of, and they're able to show that they're driving towards a development solution, which their constituents would really like*'. The organization was able to tap into this motivation for local self-actualization and make it a strategy to motivate otherwise uninterested government officials to deliver safe

water. The example also shows that local actualization and outside actualization are not mutually exclusive strategies but rather necessary to create the long-term solutions that both stakeholders desire.

Unsuccessful strategies

Figure 2 presents the data from unsuccessful strategies. Specifically, it shows what motivations were targeted in strategies that were not sustainable. In many cases, participants explicitly indicated that strategies failed because they *failed to focus* on particular or multiple motivations; these are also represented in Figure 2.

Unsuccessful strategies focus on excessive outside actualization (goals of outside stakeholders)

Of the unsuccessful strategies, 65.7% (46 out of 70) focused on excessive outside actualization compared to 4.1% (6 out of 148) of successful strategies, suggesting that strategies with excessive outside actualization may be at far greater risk of failure. One example of this is an organization that tried to copy another organization's approach to delivering hand pumps. The participant reports: '*They brought drawings from I don't know where … and they installed it in communities of 400 people [instead of 100–150 people] – and then the pump broke down … the people got discouraged, and they said, ah, you know – see, this technology is not working*'. This otherwise successful approach failed because it was modified to meet the excessive outside actualization motivations of budget, scale, and schedule. While it is necessary to take into account outside motivations and limitations, doing so in a way that does not compromise the structural integrity – either physical or motivational – of the development effort is vital to long-term sustainability. We claim this is likely also important in order to successfully scale up approaches.

Unsuccessful strategies fail to focus on higher-level motivations

Figure 2 illustrates that unsuccessful strategies also failed to address higher-level motivations: 75.7% (53 out of 70) were reported to fail to address self esteem, 54.3% (38 out of 70) failed to address love and belonging, and 78.6% (55 out of 70) failed to address safety and security. Similarly, Figure 2 also shows that very few unsuccessful strategies focused on higher-level motivations like self-esteem (10%, or 7 out of 70), love and belonging (4.2%, or 3 out of 70), and safety and security (10%, or 7 out of 70). Building motivation on higher-level motivations appears to be key in building more sustainable results.

For example, one unsuccessful strategy focused on physiological motivations such as avoiding arsenic in drinking water. While addressing arsenic is important, local stakeholders demonstrated clear evidence of not using or maintaining arsenic-free wells, which suggests physiological needs may or may not have been a primary motivator of local stakeholders. A common approach to solving this has been to continue to prioritize health as a motivator in behavior change communication. However, according to Maslow's theory and our data, strategies that target higher level motivations such as local actualization (health as a means to an end), respect (local priorities and preferences), belonging (ownership over decisions), and safety (preference for the familiar) had higher rates of success than focusing on health as a sole motivator.

Unsuccessful strategies fail to focus on multiple motivations

Participants reported that unsuccessful strategies were also more likely to fail to focus on multiple motivations. One participant recounted the consequences of failing to account for diverse motivations: '*One of the things we found is that people don't walk as far to get water as you would think that they would want to, they are just going to use an alternative source*'. In other words, convenience (local actualization), habit (safety and security), and water quality (outside actualization) were sometimes conflicting motivations that led to users choosing dirty but convenient water sources over farther sources that were clean.

The need for strategies to address multiple motivations aligns well with Maslow's theory, which says that the needs of the whole individual must be holistically addressed. Similarly, individuals' motivations are not static. An approach that targets multiple motivations better allows for variation over time and for differences in context and

preferences Future research should explore how to more reliably create strategies that more holistically address multiple stakeholder motivations.

Unsuccessful strategies addressed motivations unsuccessfully

Of the successful strategies, 39.2% (58 out of 148) focused on local actualization, while just 17.1% (12 out of 70) of the unsuccessful strategies did so. Based on theories of participation (Isham *et al.* 1995), we might have expected the difference between the two categories to be even higher. However, just because a strategy attempts to motivate does not mean that the approach used is successful.

For example, current development discourse emphasizes the importance of supporting local governments (OECD 2005; UCLG 2015), yet the data remind us that these strategies must also be successful to create local actualization in practice. For instance, one government leader and participant cautioned: '*That is where sometimes it falls in the cracks because they [the organization] will assume the regular maintenance will be part of the subsequent government budgets, [and] the local authorities where this structure's being put should pick up that regular maintenance. So [they're] assuming there will be a water office in that area which will handle the management of the facility*'. In this case, a lack in resources or capacity caused this effort to fail despite the attempt to support local self-actualization through local ownership.

In a second example, an interview participant shared how his original strategy aimed at creating local self-actualization failed because he inadvertently created a sense of inequality between the entrepreneurs he tried to empower and other local stakeholders: '*It's the perception that one of our own was taken out of our environment, he was fattened up at a workshop and given cement and we have to pay him [for this same cement]? You see? It completely distorted the community dynamic, completely*'. As this example shows, local infrastructure users are not a singular, unified group, but rather have competing interests and desires (Cornwall 2003). The interview participant also reported that as part of creating a strategy based on local actualization, he decided to train local people to start businesses. However, he noted that just because someone is local does not mean that they are automatically motivated to be an entrepreneur; he felt that this disconnect caused the effort to fail. In other words, just as not all local people share the same motivations, not all local stakeholders will respond to a particular motivation. These various examples emphasize the need for approaches that target local motivations rather than external understandings of those motivations, approaches that target multiple motivations to recognize local diversity in different contexts, and approaches that prioritize the local institutional environments (Scott 2013) that enable or prevent the realization of those motivations.

CONCLUSIONS

It is now common to hear that the WASH sector needs to focus on motivations beyond health (Kaminsky & Javernick-Will 2015). Our paper contributes to this conversation by leveraging theory that helps us understand what these multiple and dynamic motivations are, considering the case of sustainable rural water. The practical goal of this research is to increase the sustainability of efforts in rural water development by (1) examining to what extent our solutions to deliver rural water align or not with what we know about human motivation, and (2) using the examples and expertise of leaders to leverage our understanding of how to build solutions that better align with motivations of all stakeholders. This is particularly important as the sector pursues delivering sustainable rural water services by both building and managing user demand (Alderwish & Dottridge 2013; Harriden 2013).

Using Maslow's theory of motivation as a framework, we examined how development strategies that have succeeded or failed to create sustainable rural water services align with motivation. Through a qualitative coding and analysis process, we found that in this dataset there were four typical characteristics of *successful strategies*:

1. Successful strategies did not focus on physiological motivations.
2. Successful strategies focused on higher-level motivations.
3. Successful strategies focused on multiple motivations.
4. Successful strategies address the motivations of all stakeholders, including higher level motivations.

There were also four similar characteristics of *unsuccessful strategies*:

1. Unsuccessful strategies focused on excessive outside actualization (motivations of outside stakeholders).
2. Unsuccessful strategies failed to focus on other higher-level motivations.
3. Unsuccessful strategies failed to focus on multiple motivations.
4. Unsuccessful strategies fail to successfully meet higher-level motivations.

The examples given by leaders and practitioners in the WASH sector provide valuable insights and empirical evidence for shifting rural water development strategies to better align with existing local motivations. They also provide practical and tangible experiences for how to do so or not do so in practice, thereby saving those who would embrace their lessons the time, money, and challenges of repeating avoidable mistakes. Future research should focus on continuing to learn and understand how to best align WASH sector strategies with motivations of all stakeholders. In addition, future research should focus on how to apply the findings to design solutions that consistently match the motivations of all stakeholders in different contexts, thereby laying a strong foundation to sustain and scale impact. In conclusion, we claim that strategies that align with local motivations are more likely to lead to sustained behavior change, which will in turn more effectively accomplish donor-driven development goals of improving public health.

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