Bridging Policy, Practice and Research for WaSH and Wellbeing
Doing Development Differently: Bridging Policy, Practice, and Research for WaSH and Wellbeing
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The WaSH and Wellbeing: Changing Evidence and Evidence for Change in Rural Communities initiative was designed to deliberately break the box on the way that we, as researchers, policy-makers, and practitioners, view development in WaSH. As co-sponsors the United Nations University Institute for Water, Environment and Health, the Canadian Coalition for Global Health Research, the University of Waterloo, and McMaster University are pleased to present the following report.

Our institutions are committed to addressing the problem of inadequate drinking water and sanitation in rural and remote communities for improving health and wellbeing, both in Canada and globally. As such, we believe that the exploration of different transformative approaches to triangulating policy, practice, and research is critical to addressing the WaSH crisis. Together, we bring strengths in policy, practice, and research that can be used to generate, inform, manage, bridge, and evaluate evidence and experiences, gaps and failures, and solutions and innovations.

We believe that these efforts are extremely important and timely given the UN resolution on the human right to water and sanitation and the strong emphasis on water, sanitation, and wastewater in Sustainable Development Goal 6. We appreciate the important contribution of CIHR to the initiative. We look forward to continuing the network partnerships in order to realise effective, sustainable, and scalable universal access to water and sanitation services.

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Potable water and improved sanitation are the foundations for sustainable development. Access to safe water sources is integral to global health and human well-being, yet many people around the world still lack access. Over 700 million people worldwide do not use improved drinking water sources. Many more have intermittent access or drink water of poor quality despite using an improved source. The health of these people is significantly compromised through exposure to a wide range of water-related diseases. Physical vulnerability and social inequities mean that women and children are the most severely affected by diseases associated with contaminated water. This poor health affects the productivity of the labour force, children’s ability to attend school, and drains health care systems. Sufficient water resources are also imperative for food security.

Global aid and national investments typically fall far short of what is needed despite the evidence as well as a moral imperative and prioritisation by civil society to address these issues. Moreover, such investments tend not to be expended on those in greatest need. With a price tag of just over $530 billion (World Health Organization, 2012), universal access represents a significant, yet affordable investment, especially through innovative financing mechanisms and cross-sector leveraging. The face of Overseas Development Aid (ODA) is changing, with emerging economies now investing in development. ODA for WaSH has been challenged for its overall effectiveness, inequitable allocation, and low prioritisation within the overall ODA envelope (e.g., GLAAS reports, Dead Aid).

WaSH issues are of particular importance to women and girls who play a transformative role in life and society. Women and children are often responsible for collecting water for the household, forcing children to miss school and leaving women unable to participate in other economic activities. In as much as WaSH is a pillar of development, women underpin and are custodians of water and sanitation, since both women and girls are removed from alternative economic and educational activities to fetch water. As a result, it is the women with the most to gain who are the strongest advocates for, and managers of, WaSH.

Technological solutions exist but are not accessed systematically due to the lack of coordinated policy, practice, and research that include both top down and bottom up decision-making. Notwithstanding that technology is necessary to resolve the current WaSH crisis, and there are opportunities to translate technologies to be more efficient and relevant in low resource settings, technology is insufficient in and of itself. Hardware must be supported by capacity, engagement, behaviour change, institutions, and policies in order to be sustainable and sustained.

A holistic approach is the most effective and sustainable way to intervene against these complex processes that endanger water supplies and compromise human health. The global socio-ecological system as a whole must be considered when addressing issues of water quality; holistic health of an ecosystem will contribute to keeping water clean and available. Protecting the health of water resources
by managing upstream inputs from agricultural and industrial activities will alleviate water quality issues. Land should be managed sustainably to control soil erosion and maintain natural springs. Agriculture practices which consider water quality and security should be employed. In addition, the development and dissemination of innovative technologies, which serve to address the challenges presented by global environmental change can alleviate pressure on water resources, replacing current unsustainable technologies. Innovative promotion of alternative livelihoods is needed to support workers in water scarce areas whose livelihoods are threatened by the effects of global environmental change.

Global environmental change poses an increased threat to the already precarious WaSH situation. A concerted collective effort from all relevant sectors engaging stakeholder groups at all levels is needed to withstand the threat. As water and global environmental change affect all people and transcend sectors, responses need to be inter-sectoral, trans-national, and cross-disciplinary. People at all levels of society should be engaged in decision-making processes to ensure that the interests of all stakeholder groups are fairly represented. Communities should take the lead in implementing measures to ameliorate the effects of global environmental change and protect water resources at the local level as this will provide a sense of ownership to local participants, thus ensuring the sustainability of initiatives. Understanding local perceptions and behaviours, and utilising traditional knowledge are keys to success. Since social cohesion is important to ensuring effective ecosystem management, initiatives which encourage communities to work together and build trust are particularly important.

Capacity development is needed to enable relevant groups to meaningfully participate in finding solutions. Capacity development should be undertaken at the local level to best prepare communities to manage their water resources within the context of global environmental change without dependence on external resources. Approaches must be flexible enough to enable communities to adapt them to best suit their context. Local technical capacity building in monitoring and testing to track the effects of global environmental change will enable approaches to more accurately respond to ongoing changes. Additionally, educating the general public on the impending risks to WaSH and local water security can help to mold public opinion on the issue. An educated public can make more environmentally and socially conscious choices and can garner sufficient support for changes in policy at the political level. At the national and regional levels, decision-makers need to be educated on the consequences of global environmental change on water security and how they can make effective policy to mitigate those effects. Making the most current scientific research on this issue available to these groups is an essential part of education. Sharing of best practices and lessons learned as well as data collected between regions facing similar issues can provide a basis for evidence-based decision-making.

Real progress is dependent upon understanding policy, practice, and research and the interaction between them. This publication identifies a “Mucky Middle” where policy and practice and research interact, but where transformative interactions are poorly understood. In this manner, the “Mucky Middle” is the only place where the issues of universal access can be solved. Given the ineffectiveness (inefficiencies) in the top down and bottom up approaches, the importance of harnessing the “Mucky Middle” to solve the global water and sanitation crisis becomes paramount. As such, it is important to identify innovative ways to support partnerships/interactions in the “Mucky Middle” to address the issues of providing water and sanitation services.

This change is more than just knowledge transfer or knowledge translation. This is the process of doing development differently:

• Recognise and accept WaSH as central to development, economic growth, human wellbeing, and environmental integrity;
• Recognise and incorporate progressive realisation of the right to drinking water and sanitation;
• Provide a way to co-ordinate external and domestic resources with civil society action;
• Provide a pathway for changes to the roles and priorities of national governments, whether donors or recipients, to prioritise WaSH in national agendas;
• Emphasise the importance of enabling environments for WaSH; and,
• Provide a framework for a strength-based approach to development that links policy and practice to research.
To ensure scalable and sustainable development in the WaSH sector, there is a need for a different mind-set that recognises and unlocks the complexity of the inter-sectoral, interagency, co-operative strategies needed to ensure universal WaSH access. This requires:

- Agreement with the statement of values that drinking water and sanitation are a human right;
- Appropriate and affordable interventions (policies, legislation, infrastructure, technology, and behaviour change) that provide, prevent, mitigate, and scale;
- Stable financing mechanisms;
- Readiness for change at all scales and a stable environment within which this change can occur;
- Political will backstopped by capacity, investment, and supply chains; and,
- A path through competing politics, priorities, geographies, and belief systems.
INTRODUCTION

At the dawn of a new millennium, world leaders came together in an unprecedented move and committed to a new global agenda to alleviate poverty and improve the wellbeing of the world’s poorest populations. Despite good intentions and significant progress on many fronts, the Millennium Development Goals (MDGs) failed to achieve many anticipated targets. Moreover, targets that were ostensibly met globally still left many behind. Entrenched views on aid, investments in development, and profit maximisation have not achieved global, regional, and national development goals. Most off-track countries for MDG targets are in Sub-Saharan Africa where there are clear inequalities in access, including rural communities, indigenous populations, women and girls, and those with physical impairments. Aid structure and policies must be redefined to recognise the urgency of this situation.

This report is the culmination of an initiative that brought together international experts from a variety of sectors to engage in a dialogue concerning water and related health issues faced by rural, remote, and indigenous communities. In examining health and wellness from a transdisciplinary perspective, we were able to build upon the knowledge that has been developed and to identify opportunities to translate that knowledge into policies that work.

The main objectives were to:
1. Build networks between sectors;
2. Exchange lessons between researchers and implementers;
3. Exchange lessons between developed and developing regions;
4. Broaden the range of evidence used for decision-making; and,
5. Contribute evidence for sustaining and up-scaling appropriate interventions.

It is argued herein that, within the context of mounting global pressures and stresses and a global dialogue on the agreed upon 2030 sustainable development agenda, it is appropriate to reflect on innovations that could drive a new development paradigm in support of more holistic economic and social development linked to environmental integrity. More specifically, one of the lessons to be learned is that it is the processes of development that require attention if we are to achieve a world of equity and sustainability. In other words, we need to navigate the space and harness the strengths of the policy, practice, and research interactions. This has to be accomplished in a manner that is transdisciplinary and trans-sectoral, and which involves stakeholders in transparent and positive solutions. This latter point is extremely important, as many processes discussed within this document can be harnessed for good or bad intentions.
The purpose of this document is to highlight development challenges, particularly as they relate to the processes of development in the water, sanitation and hygiene (WaSH) sector, and put forward our understanding of how policy, practice, and research could be used co-operatively to achieve sustainable development through a multi-sectoral response. The report begins to identify the critical junctures at which policy, practice, and research must intersect to coherently deliver effective and appropriate WaSH. We propose a new model for doing development differently.
WaSH AND WELLBEING

THE PROBLEM

Water and sanitation is a “key element of the development equation” (Schuster-Wallace, Grover, Adeel, Confalonieri, & Elliott, 2008). Lack of access to safe water and adequate sanitation, coupled with poor hygiene, threatens human wellbeing, especially within the context of global environmental change. Changes in temperature and precipitation patterns are altering the distribution of water and water-related pathogens and vectors. Increasing water scarcity reduces effective hygiene practices, contributing to skin and eye infections as well as gastrointestinal illnesses. A lack of, poor management of, or failing water infrastructure compound these issues. This exposes rural, remote, and marginalised populations, in particular, to ameliorate adverse health impacts. There is a critical need, globally, to address the problem of inadequate supplies of clean, safe drinking water and appropriate sanitation to improve health.

Globally, access to potable water and protected sanitation facilities/wastewater services are woefully inadequate to protect health, wellbeing, and the environment, especially in rural, remote, and informal settlements. Approximately 660 million people do not have access to improved drinking water and 2.4 billion do not have access to improved sanitation (UNICEF & World Health Organization, 2015). The majority of the almost 1 billion people practicing open defecation live in rural areas (UNICEF & World Health Organization, 2015) and these areas receive the least WaSH development investments (UN Water, 2014). Even where infrastructure exists, service quality and sustainability of water and sanitation access cannot be assured, as evidenced by the Walkerton tragedy of 2001 (Burke, 2001; O’Connor, 2002) and boil water advisories during the 2013 flood events in Alberta (Huffington Post Alberta, 2013), as well as a lack of 24-7 water access or sub-potable water quality in many low and middle income country (LMIC) municipal systems. An astonishing 80-90% of wastewater in LMICs is discharged untreated into surface waters, consequently contaminating drinking water sources (Corcoran, 2010).

WaSH, while imperative for human survival, is not the only demand on water resources. Water is a finite resource of which only 3% is fresh water; 99% of this is held in snow and ice caps, and is therefore unavailable. Food is of equal importance as drinking water for survival and requires significant water resources, particularly when farming marginal...
agricultural lands. Globally, approximately 70% of water is used by the agriculture sector (FAO, 2015). In addition, water is required for energy generation and industrial processes as well as recreation. Given climate change impacts, many regions are experiencing different rain and snow amounts, floods or droughts, and different timing of wet seasons and established climate patterns. Competition for water resources will increase over coming decades due to finite amounts of global water resources and rapid population growth, which will increase demands on food, energy, and water. Add the disconnect between political and water boundaries, and the need for integrated management, equitable and sustainable prioritisation and allocation, and transboundary co-operation become paramount. To achieve these ends is not the job of any single practitioner, but rather the appropriate and co-operative concern of policy makers, practitioners, and researchers.

THE LINKAGES

Wellbeing is underpinned in all aspects by WaSH, including school attendance, productivity and income generation, nutrition and stunting, cognitive impairment, and avoidable deaths. Birthing mothers and young children represent particularly vulnerable groups. Wellbeing of women and girls is most significantly impacted through lack of access to WaSH, physical and sexual assault, and complications in pregnancy and delivery. Indeed, issues of water quality and quantity are of particular importance to women who spend 16 million hours each day collecting water (UNICEF & World Health Organization, 2012), but gender inequalities mean that women bear much of the responsibility and little, if any, of the authority.

Health impacts include increased susceptibility to illnesses which result in both morbidity and mortality. It is estimated that 840,000 people die of preventable water-related illnesses in any given year, including 5.5% of deaths in children under-5 (Prüss-Ustün et al., 2014). Moreover, in children, chronic diarrhoea can lead to malnutrition resulting in both physical (Fink, Günther, & Hill, 2011; Schmidt, 2014; Rah et al., 2015) and cognitive impairment (Kar, Rao, & Chandramouli, 2008). Children are at greatest risk from water-related illness, with 60% of infant mortality attributed to WaSH-related infectious diseases (Montgomery & Elimelech, 2007) and their overall health is compromised throughout childhood when their nutritional status is compromised (Charmarbagwala, 2004). Each year, children lose 272 million school days due to diarrhoea (Hutton & Haller, 2004). Women are particularly vulnerable during pregnancy and childbirth, with water-related diseases linked to anaemia, increased risk of post-partum haemorrhaging, and low birth weights (Schuster-Wallace & Watt, 2015). Lack of adequate WaSH in health care facilities compounds this through increased risk of post-partum infection (sepsis). Indeed, in-patients, regardless of the original reason for admittance, can acquire water-related infections while in hospital with inadequate WaSH, thus extending their stay and further draining resources. These facilities can further perpetuate infectious disease outbreaks such as Ebola if unable to implement proper infection control (Frieden, Damon, Bell, Kenyon, & Nichol, 2014), exacerbating transmission in facilities designed to protect and save lives.

Substantial evidence exists linking this lack of access to national fiscal losses, with an estimated global annual economic loss of $260 billion associated with inadequate water and sanitation access (Hutton, 2012). This is in part due to the strain on health care system resources, especially when scarce hospital beds are taken up by people suffering from preventable water-related illnesses. Not only does illness place a burden on health care resources, but also on workplace productivity and therefore economic activity through lost work time (illness and WaSH facilitation) and lower education levels through impaired cognitive development and lost schooling. The inclusion of appropriate sanitation facilities in schools has increased attendance by girls almost 15% (UN-Water, 2008).

More generally, these burdens prevent women from engaging in alternative activities that have a positive impact on the family unit. Social impacts include basic family survival, especially if the mother dies; barriers to education, particularly for post-pubescent girls; impact of lack of education on family public health practices; time taken for water collection and finding a place to relieve themselves, often a woman’s burden on top of already demanding domestic
responsibilities; and, caring for sick members of family when they succumb to preventable water-related illnesses.

In addition to the direct negative consequences, a number of lost opportunities are created through inadequate WaSH. It has been established that under-5 mortality can be reduced by 2.45 deaths per 1,000 with access to improved sanitation and by 2.25 per 1000 with increased water access (Cheng, Schuster-Wallace, Watt, Newbold, & Mente, 2012). In LMICs, each 1 per cent increase in female secondary schooling typically results in a 0.3 per cent increase in economic growth (Dollar & Gatti, 1999).

Moreover, a significant number of people, typically in vulnerable groups, face a lack of access to WaSH in high-income countries including the urban poor and indigenous populations. This can be a result of lack of infrastructure and/or the inability to pay for services and/or physical inaccessibility (distance, topography). For example, 39% of the almost 600 First Nations water systems in Canada have been categorised as “high risk” and rural systems in Canada are 2.5 times more likely to be classified as high risk (Aboriginal Affairs and Northern Development Canada, 2012). Furthermore, more than 17,000 households in the city of Detroit had their water supply cut off in 2014 because they could not afford to pay their bills (Maqbool, 2014).

Changing population dynamics (growth in some regions, ageing populations in others, rural-urban migration), urbanisation, changes in land use and climate change, are increasing stresses on the quality and quantity of, and thus competition for, our water resources. Many regions are experiencing the effects of increasing frequency, variability, duration and intensity of floods and droughts. As a result, a greater proportion of the world’s population is likely to have at least short-term disruption of WaSH services in the future.

THE DEVELOPMENT CHALLENGES

Despite the availability of technological solutions, the problems are not solved. If the global water crisis was simply one of technology, we would have already met the MDGs and be well on our way to universal coverage instead of talking about continuing inequities and lagging sanitation targets. The challenge lies in discovering suitable combinations of appropriate and effective hardware (technology) coupled with culturally appropriate and relevant software (behaviour change, knowledge, and understanding) (Schuster-Wallace, 2012).

The development environment will also shape our ability to be proactive and respond to WaSH problems. In order to tackle WaSH problems sustainably, it is essential to holistically address water, sanitation, and hygiene interactions, effects, and prevention strategies (Elliott, 2011). This is set against a backdrop of the need to manage water holistically given its role in society as a resource, a vector, and a sector in its own right. While many immediately revert to the physical properties of water to describe this backdrop, it cannot be forgotten that water holds spiritual meaning in most cultures (Watt, forthcoming). Therefore, from a community perspective WaSH takes place within a cultural context, requiring an understanding of ALL aspects of WaSH requirements in order to ensure the most appropriate solutions. Externalities to also consider when determining the most appropriate solution include physical, geopolitical, and socio-economic

In a post-2015 agenda, established principles of universality, social development, and sustainable growth are likely to have significant implications for water resources management in general and for drinking water and sanitation specifically.

1. Rittel and Webber (1973) identify a “wicked problem” as one that is difficult to solve because it is unique and a symptom of another problem, it cannot be formulated definitively, and it is difficult to know when the solution has been found; “the formulation of a wicked problem is the problem” (Rittel and Webber, 1973: p.161).
contexts, at all scales. This complexity, with all of its disconnects, shortcomings, and overreach, leads us to concur with others that WaSH should be considered a “wicked problem”\(^1\) (de Albuquerque & Roaf, 2012) and as such, requires a systems approach\(^2\) to development practice.

While it is still important to improve and develop new technologies, there is a need to ensure sustainable implementation of existing technologies. Technological solutions are not accessed systematically or applied sustainably, and operation and maintenance funds are inadequate (World Health Organization & UN-Water, 2014). There are still technical needs to be met such as improved efficiency – energy, effluent, footprint, cost; detecting and removing emerging contaminants and enhancing effectiveness at, for example, arsenic removal; and, resiliency in terms of maintenance, operator capacity, and future water quality and quantity constraints.

Most barriers are not technological; rather the issue is a combination of hardware (technology) that is appropriate and effective, adequate capacity, and resources, with software (behavior change, knowledge, and understanding). So, instead of just having access, the hardware is used and managed properly and sustainably. Money, and water itself, are unevenly distributed over space and time, and are in competition with other needs and sectors. Moreover, time and expertise are required to bring about systematic and sustainable change; commodities that are in short supply and often overlooked in the quest to build more widgets. Technical, community, and institutional capacity are required for sustainable change. This includes the ability to manage financial flows and the institutional structures to support proven solutions on the ground. This represents a sea change in development; ensuring ownership and uptake of solutions at the local level and looking to multi-stakeholder and inter-sectoral compacts rather than the current sector and stakeholder protectionism that can be observed at all scales. In order to achieve this, coordination and communication between stakeholders, including community members, and education of investors, policy-makers, and community members is essential.

The main challenges can be summarised as:
- Information deficit – access to knowledge of what works, what does not, and what is needed;
- Lack of technological, financial, and managerial capacity;
- Lack of community engagement and empowerment to create knowledge and understanding;
- Inadequate investments – time, money, and infrastructure (hard and soft);
- Insufficient attention to issues of hygiene;
- Lack of recognition of the multi-dimensionality and interconnectivity of internal and external drivers of WaSH (systems approach); and,
- The dynamic context within which WaSH development needs to occur (shifting government and recipient priorities; external pressures such as climate change, migration, and population growth; social and economic instability).

“The blame falls variously on legislators for their lack of political will, practitioners for their resistance to changing familiar practices, and researchers for their overconfidence that their findings, once published, will speed into practice.”

(Green et al., 2009, p. S186)
I. STATE OF POLICY
A key criticism of the water sector is that it is fragmented. As a resource and a sector, it is only to be expected that its different roles and purposes would be governed by different entities. In reality, this fragmentation produces a confusing and often contradictory landscape in which practitioners attempt to function. For example, drinking water may be under the jurisdiction of a ministry of environment or health; it could be a national or sub-national responsibility. Sometimes jurisdiction is determined by where a service is delivered e.g. education if in schools; health, if in hospitals and clinics; and some countries have dedicated ministries for services such as sanitation while others do not.

The bottom line when it comes to policy is the lack of co-ordination and collaboration both within and between governments, NGO’s, the private sector, and the public. Decentralisation, while laudable, tends to fall victim to the disconnection between responsibility and sufficient financing.

At the international level, pollution and competing transboundary demands and interests, as well as reliance on overseas development assistance rather than national investments, challenge co-operation and sustainable management of water as a resource.

II. STATE OF PRACTICE
WaSH coverage and quality in essential institutions such as schools, health clinics, and even government offices are completely inadequate; some are actually built without WaSH facilities. The MDG target to halve the number of people without access to improved drinking water and sanitation were met ahead of time for water, but 660 million people are still without access to improved drinking water supplies (UNICEF & World Health Organization, 2015). Sanitation is not even coming close to meeting its target, with approximately 2.4 billion people currently without access to safe sanitation. The practice of open defecation remains common especially, but not exclusively, in Africa and
South-East Asia. Hygiene (hand washing with soap), although generally considered to be more cost effective at preventing diarrhoeal deaths than improved water supply (Jamison et al., 2006), is not included in the MDGs even though 1,600 (Prüss-Ustün et al., 2014) children per day continue to die from diarrhoeal disease, 90% of which is WaSH-related, and 50% of child malnutrition and stunting is WaSH related (Prüss-Üstün, Bos, Gore, & Bartram, 2008).

The continuing WaSH deficit impacts all aspects of wellbeing including effective health care provision; access to education and educational attainment (especially for girls); economic opportunities and development; and, worker morale. At all levels, these issues are only starting to be addressed as they should - in a cohesive and integrated way that recognises WaSH as a fundamental and cross-sectoral issue.

Moreover, we keep doing the same things over and over, without measuring/evaluating the uptake and sustainability of interventions. Practice needs to focus on these issues, to learn from our failures as much, if not more, than from our successes. What works in one setting may not work in another. How do we know and how do we predict the circumstances under which the solutions will continue to work well over the long-term (e.g., pervasive corruption; armed conflict; danger to development workers)?

### III. STATE OF RESEARCH

A considerable amount of evidence is available, including the extent and distribution of disease burden (mainly diarrhoea), and the cost-effectiveness of WaSH interventions. Progress is being made in the design and use of measurement tools, such as the sanitation and drinking water “ladders” (UNICEF & World Health Organization, 2013) that can be used to assess progress. Furthermore, global research priorities for the prevention and management of diarrhoea have been determined (Wazny et al., 2013). A recent study of a group of countries contributing 80% of the world’s diarrhoea deaths provides a useful “bottleneck analysis” (Gill et al., 2013).

Statements about proposed actions that include research strategies are available. An example is an Agenda for Action in Seven Domains, one of which is related to HSW (health, sanitation, water) in health research (Cairncross, Bartram, Cumming, & Brocklehurst, 2010). A more recent example of proposed action steps includes “increased investments in research” (Chopra et al., 2013).

It is clear that significant knowledge gaps remain that require further research, including:

- Understanding local (and national) situations, including scaling up strategies (What has and has not worked, and why?);
- Inter-country comparative studies (Why are there major progress outcome differences between countries with similar development indices?); and,
- Research capacity gaps (including both knowledge production and delivery capacity) particularly in countries where WaSH coverage is low and the related disease burden is high (What is known about national research capacities to address WaSH challenges? What can be done to reduce these challenges?).

### IV. STATE OF AID

Traditional ODA donor countries are being joined by emerging economies investing in development. Increasingly, this development aid is being linked to economic growth, resource procurement, and political security as well as the extension of domestic programming (Hampson & Daudelin, 2002), donor preference (as opposed to local
need) (Gill et al., 2013), and domestic economic benefit. While there is an increasing call by donor countries for national LMIC governments to (re-)prioritise budgets for development investments, change is slow in coming.

ODA for WaSH has been challenged for its overall effectiveness, inequitable allocation, and low prioritisation within the overall ODA envelope (e.g., GLAAS reports, Dead Aid). Despite a moral imperative and prioritisation by civil society to address issues of WaSH, global aid and national investments typically fall far short of what is needed. Aid commitments for sanitation in particular shrank in 2012, comprising one-quarter of water and sanitation ODA, as compared to one-third in 2010 (World Health Organization & UN-WATER, 2014). While WaSH investments make sound economic sense, with an average return on investment of US$5.5 per US dollar invested (Hutton, 2012), global investments in WaSH fall far short of that for health and education (World Health Organization & UN-Water, 2014). Moreover, such investments tend not to be expended on those in greatest need. With a price tag of just over $530 billion (Hutton, 2012), universal access represents a significant, yet affordable investment, especially through innovative financing mechanisms and cross-sector leveraging. For example, universal WaSH access in countries, which currently fall into the lowest quartile of access has the potential to save at least 5 maternal and 5 infant lives per 1,000 population (Cheng et al., 2012).

Several solutions are emerging within different contexts. Innovative financing mechanisms and risk mitigation for investment in the so-called “bottom of the pyramid” (approximately 1 billion people living on less than a dollar a day: Collier, 2007) will reduce barriers for private sector engagement in LMICs generally and with impoverished clients more specifically. Government offset mechanisms can be used to distribute social and economic costs and benefits across sectors and departments. For example, anticipated savings in the health sector could be applied to expand WaSH services, even if this is the responsibility of the water or environment sector. Global credit mechanisms, such as those already established for carbon, can provide incentives for private sector investment in social and environmental improvements. Finally, innovative private, donor, public, and NGO collaboration mechanisms, such as shared value opportunities (Porter & Kramer, 2006; Pirson, 2012), can be leveraged to improve social conditions and strengthen supply chains as well as local markets and, consequently, local and regional economies. These solutions represent elements of a framework for intersectoral cooperative action, as opposed to a divide and conquer approach. Rewards must incentivise working together rather than in silos.

THE KNOWLEDGE CONTEXT FOR BRIDGING POLICY, PRACTICE, AND RESEARCH

Existing approaches fail to provide systematic attention to inter-relationships at the policy-practice-research nexus. In other words, wicked problems such as WaSH require a concerted, transectoral response employing new, integrated, transdisciplinary approaches that are only partially addressed in the current literature. Solutions exist that are both affordable and appropriate for many individual situations around the world. What is missing is an understanding of when, where, and, more importantly, why well-intended efforts do not work. Much of this understanding is linked to how technologies become accepted by communities, what behavior change and decision-making processes

The most effective strategies to bridge the gap between research and practice, will have at their heart, effective academic-practice-policymaker partnerships. (Brownson and Jones, 2009, p. 313)
are involved, and how different stakeholders with different perspectives, levels of power, and institutional and individual drivers can be co-opted to achieve a common goal. This knowledge is critical for scaling up and scaling out sustainable practices and can be described as the “evidence for change”. Much of this information comes not from stories of success, but from stories of failure. What didn’t work? What conditions made success elusive? Are we continuously repeating our mistakes, but hoping for a different outcome? Is it just a matter of money or are we tilting at windmills?

While we know that policy, practice, and research interact, and that we need the evidence generated through research to inform policy and practice, we do not understand (how to catalyse and control) the interaction. To bridge the divide between individual elements of the policy-practice-research nexus we need to understand the characteristics of both top-down and bottom-up approaches that are currently used in development practice, navigate the barriers and inefficiencies of each approach, and harness the strengths for change.

Top-down approaches often consist of policies guided by ministers, cabinet members, and development partners who may not know the realities on the ground. The nature and focus of the policies may better reflect the priorities of lobbyists than local citizens. This centralised decision-making imports policy initiatives from the top down into communities with little, if any consultation with the community or even with the middle partners. In many countries, this follows an institutional framework that is already vertical (top, district, sub-county, village). Policies and practices that originate from the bottom-up have community involvement and thus recognise the realities on the ground. Typically, this approach emphasises local decision-making and the development of a framework for community participation and grassroots mobilisation.

While this may suggest that bottom-up approaches are preferable, the reality is that on the ground, while they experience the effects of a problem and may be able to identify at least some of the causes, a lack of capacity, resources, knowledge, and strategies may limit effective change. When the top-down and bottom-up approaches
are combined, ownership and implementation of policies is facilitated through all levels and the multi-sectoral, multi-stakeholder perspectives introduced encourage accountability frameworks and strong monitoring and evaluation strategies.

While several approaches exist in the literature to explain and support specific interactions within the nexus, there is no overarching approach that holistically navigates policy-practice-research nexus interactions, while addressing wicked problems in sustainable development. For example, knowledge translation is an approach that has been embraced by the academic community in an attempt to make research more available for policy-makers (Shaxson, 2009). Some universities have hired knowledge brokers specifically to make research more relevant and accessible to those outside the academy. Within the context of the policy-practice-research nexus, knowledge translation is typically unidirectional, pushing research to policy or, less often, practice and expecting stakeholders to use the best evidence available to make informed decisions. The difference in status (e.g. power, ownership of research, philosophical differences) between academics and practitioners can affect the practitioner’s confidence in expressing and fully participating in research. However, as elucidated by Green et al. (2009), “unless the research clearly addresses questions important to practitioners and produces findings that can be readily applied to their populations in their settings, they remain unlikely to consume it” (p. S187).

In the framework of Edelenbos, van Buuren, and van Schie (2013), knowledge translation would be categorised as minor or medium interaction, where knowledge is developed either independently or simply in a way to convince others of its validity. However, the best way to ensure that research results in changes to policy and/or practice, is to involve relevant stakeholders not only in identification of gaps, but problem definition and design, and development of the research framework. However, this collaborative co-generation of knowledge is hindered by three types of factors (Weichselgartner & Kasperson, 2010):

- Functional – diverging objectives and priorities;
- Social - cultural values, communication, understanding, and mistrust; and,
- Structural – different institutional settings and standards as well as different timeframes.

Additionally, it is noted that each sector has different and sometimes competitive reward systems. For example, bonuses paid for additional toilet block construction is in direct competition with providing programs to ensure that toilets are properly used and maintained; peer reviewed publications outweigh time in the field providing community feedback in relation to academic success; short-term political agendas trump long-term development goals.

Both experts and bureaucrats are not willing to acknowledge that stakeholder knowledge has the potential to improve the identification of problems and the search for feasible solutions that address the circumstances of the direct environment. Stakeholders, on the other hand, do not have much eye for the scientific soundness of knowledge development and the political and strategic relevance of knowledge. They focus on what is relevant or appropriate for them, and often undervalue and distrust the input of bureaucrats and experts. (Edelenbos et al., 2011, p. 682)
Even so, other influences affect the bridging of research and policy (Young, 2005). These include extra-national economic, trade, and cultural influences; the individuals, institutions, and processes that comprise domestic policy-making; and, the type and quality of research. Scientists propose solutions that are often unworkable in practice, often due to a poor understanding of the institutional and other constraints to implementing changes in practice. It is important to determine how decision-makers can, or will use the provided information to develop mitigation programs and measures. The language of science is also often too complex and intimidating for many practitioners and policy-makers (Weichselgartner & Kasperson, 2010). Moreover, current paradigms do not reward people for working together.

Boundary organisations are one way to bridge research and policy or practice. These organisations sit between (at the boundary of) different perspectives (e.g. technical and general public) and provide a different approach to increase mutual understanding and mediate between different groups (Franks, 2010). In doing so, boundary organisations provide multi-directional information brokerage, translation, and communication; convene and mediate between stakeholders; contribute towards long-term trust building and network construction for collaboration; and, facilitate utilisation of comparative advantages (Cash et al., 2003; Franks, 2010). As a result, they “play an important role in “translating” and “coordinating” knowledge, particularly in developing countries with sparse networks and existing mistrust among actors” (Weichselgartner & Kasperson, 2010).

We need to ensure that researchers and policymakers share common networks, trust each other, and communicate effectively.

(Court and Young, 2004, p. 89)

There is an absence of input from practitioners in the policy-practice-research nexus. Although they are sometimes included as stakeholders, their knowledge, attitudes, and practices are often expressed through the voices of NGOs, associations, or public interest groups, which represent collectives which do not necessarily share the viewpoint of practitioners. Rather than being a spokesperson, these organisations muffle the voice of the practitioners. One of the reasons for better knowledge brokering between research and policy rather than research and practice is the stronger relationships between these groups that has developed as a result of policy decision-makers requesting input from experts. They are starting to build networks and trust, required for true collaboration and two-way communication.

The onus falls on governments to “produce policies that really deal with problems; that are forward-looking, and shaped by the evidence rather than a response to short-term problems; that tackle causes not symptoms” (Butcher & Massey, 2003,

We are rewarded for writing to our peers and not to the communities that need us.

(Weichselgartner and Kasperson, 2010, p. 273)
What appears to be lacking are formal methods that bring the different sides (policy makers, practitioners, researchers, other stakeholders) together in a genuine collaborative partnership. (Wilson et al., 2007, p. 254)

p. 148). However, this evidence should not simply lie in the realm of researchers and experts, but include “informal or tacit knowledge and information that may be context-specific, such as that from stakeholder consultations” (Wilson, Smith, Blakey, & Shaxson, 2007). Researchers still have a role to play in “jointly interpreting the evidence, or providing a translation function for policy makers,...encouraging critical analysis and rigorous debate; challenging existing lines of argument and creating new ones” to draw out and answering gaps and uncertainties (Wilson et al., 2007).

If research and practice are to have a joint meaningful input with policy, then research must be more than operational evaluation, a necessary but insufficient condition for transparency and accountability. It must include both quantitative and qualitative questioning of what we do, how we do it, and with what results. Traditional business metrics are insufficient to determine development outcomes. While important in tracking activity, the existing metrics do not adequately tell us if progress is being achieved and communities are really developing in sustainable directions. New metrics need to be developed that measure wellbeing, both from an individual and community perspective. Good intentions do not necessarily produce good results. We need to be able to understand the multiple perspectives on success and failure of any given community development initiative; we need to learn from failure and harness the policy-practice-research nexus to scale-up success.

Wechselgartner and Kasperson (2010) point to several ways to increase the effectiveness of research-based knowledge. They advise that research should, whenever possible, reject generalising, decontextualising, and reductionist approaches, increase the diversity of actors and expertise involved in establishing the research agenda, and engage end users in articulating problems and defining data needs. Sutherland et al. (2012) add acknowledgement of inherent uncertainty and disagreement, which underpins most policy-making processes as well as the need to understand the role of evidence in policy-making.
Policy design is predominantly shaped by hierarchical institutional bodies, which hold decision-making power. External drivers can create unpredictability, instability, and changing political priorities. Not only does policy need to be harmonised with practice, but also communication between people at the top and people on the bottom needs to be improved. Competition occurs between and within stakeholder groups for resources and power. Given that current approaches are unable to unravel the challenges of the policy-practice-research nexus as a holistic entity, there is a gap to be filled in order to be able to do development differently under Agenda 2030. To achieve sustainability on the ground, a balance needs to be found between the responsible authorities who control the allocation of financial and other resources, and the stakeholders who will be most affected by the implementation of policy or practice, through a process of evidence-informed decision-making.

We believe that this balance can, and must, be found in what we term the “Mucky Middle”, the place where the policy-practice-research nexus is realised and utilised. Harnessing the “Mucky Middle” will facilitate synergistic alliances to create win-win instead of win-lose discussions. The “Mucky Middle” is explained by classic game theory and the “sandbox” approach to co-operative problem-solving (Leitch, 2007). Game Theory is seen as an umbrella for rational social science (Colman, 1999) and focuses on the “logic of decision-making in social interactions” (Ostrom, 2000). In simple terms, Game Theory focuses on the behaviour of decision-makers when their decisions affect each other. On the other hand, the sandbox analogy provides an approach to co-operation based on shared visions, shared responsibilities, and shared work within a set of rules and norms, which constrain behaviour inside the sandbox. We need to learn to play co-operatively in the sandbox.

From a practical perspective, this space is where convincing evidence that provides a practical solution to a current policy problem is brought to the agenda of policy-makers (Young, 2005) by actors in research or practice. More systematic understanding of the external context, political context, and evidence, and links between them will help researchers, policy makers, practitioners, and civil society organizations to support more evidence-based policy (Young, 2005). It is important to bring different actors in the “Mucky Middle” to the table (private sector, public, NGO’s, and governments), but collective decision-making can be difficult when dealing with people with different knowledge systems and values. It is important to understand the obstacles and pitfalls that are represented in the space. Moreover, attention must be paid not only to the different sectors and stakeholders represented, but also to gender and gender strategies to ensure a fully participatory approach.

The “Mucky Middle” is constrained by both external and internal drivers. While the external drivers can exert pressure through political or public opinion, resources (economy), or catastrophic events, internal drivers may change dynamics of
control depending on who has power within the context of the problem being addressed. How people behave, whether multiple (all) voices can be heard, and the various relationships, metrics/accountabilities, and expectations held by individuals and organisations is represented in the “Mucky Middle“. Currently the “Mucky Middle” is represented by a mishmash of intentions and approaches because of the different knowledge systems and processes that have been at work to establish policy, with or without research and/or practice. Thus the “Mucky Middle” can be described as the space where:

- Need and knowledge collide;
- Individual and community interests collide stirred by political considerations and contexts;
- Interests of different constituencies collide; and,
- Different sectors compete for scarce resources (e.g. health vs. water vs. education) instead of developing synergistic approaches.

While the “Mucky Middle” requires all actors to engage, it is important to recognise and understand the limitations that each brings to the table. The public sector has legitimacy but lacks technical expertise, funds, and the ability to operate at the local level. The private sector has the finance and technical expertise, but generally lacks legitimacy. Donors have a tendency to fund countries that they have an existing relationship with, but have a problem funding countries where they do not have good policies, robust plans, or the capacity to absorb. Finally, communities/civil society have the capacity for local implementation, but lack the legitimacy and large scale capacity to reach larger populations. Perhaps because of this, everyone needs to work together and develop platforms that serve to facilitate the bringing together of those partners.
To effectively harness the “Mucky Middle” and use its resources and energies for positive development, it is first necessary to understand the components that comprise and limit the middle and the interactions or processes that make it mucky. To this end, social capital, a sociological perspective largely attributed to Bourdieu (1986), Coleman (1988), and Putnam (1995) provides a beginning point to understand the components that interact in pursuing social development. We examine the ways in which these actors engage in the development process and raise questions about traditional analyses which fail to clarify when, where, and why actors engage in the development process.

SOCIAL CAPITAL

Social capital is generated out of the relationships between people who typically share a common bond, such as an interest on an issue, experiences, values, or behaviours (norms). The term is used to encapsulate the vitality and significance of networks and community ties. First introduced by Bourdieu (1977), the social capital framework has expanded to include three dimensions: bonding, bridging, and linking (Pritchett & Woolcock, 2004; Szreter & Woolcock, 2004; d’Hombres, Rocco, Suhrcke, & McKee, 2010; Kawachi, Takao, & Subramanian, 2013).

Bonding: Bourdieu acknowledges that individuals have varying degrees of access to social networks that determine an individual’s social capital. The unequal distribution of power explains the unequal endowment of all types of capital - economic, social, symbolic, and cultural - between individual networks and connections (Bourdieu, 1986). Bonding therefore, is premised on the extent to which people trust and support one another (horizontal linkages). It consists of heterogeneous networks of family members and close friends, which makes the generation of social capital less complex due to a high degree of trust, reciprocity, and obligation, which are characteristics of bonding ties (Healy & Hampshire, 2002; Kritsotakis et al., 2011; Hawkins & Maurer, 2012).

Bridging: Bridging is defined by Putnam as the act of looking outward and occurs between groups that are dissimilar, but with loose associations. Bridging social capital reflects horizontal connections (Putnam, 1995). Thus it is characterised by both informal and formal relationships of weak and strong ties among diverse individuals and groups (Hawkins & Maurer, 2012). Bridging capital helps to connect members to resources and opportunities that are outside their tight networks.

Linking: Linking social capital is defined as “norms of respect and networks of trusting relationships between people who are interacting across explicit, formal or institutionalised power or authority gradients in society” (Szreter & Woolcock, 2004. p 655). As Healy and Hampshire (2002)
Social capital: “the aggregate of the actual or potential resources that are linked to possession of a durable network”. (Bourdieu, 1986, p. 248)

explain, linking capital leverages members of the community or networks to speak directly to people in authority (decision-makers) without having to go through brokers. Linking capital consists of connections with networks or communities of powerful people such as members of parliament, policy makers, and representatives of business and community services organizations.

In this manner, social capital involves all structures, be they political or social-economic, and can be helpful in understanding the distribution of social capital issues (i.e., Who has access to resources and what are the challenges to accessing such resources?). Capital and social production of classes and power are synonymous and intricately linked.

It is worthwhile to appreciate that the level of access of each of these dimensions of capital is different. While bonding capital originates from within families and organizations, bridging and linking capital requires people to develop trust beyond their tight networks. Despite the significant differences in the theoretical grounding, power-aspects, and what constitutes good social capital, there is a common understanding on the need to understand social capital. Bourdieu, Coleman, and Putnam seem to have a general interpretation that social capital is an important resource that is inherent in relationships, group memberships, networks, clubs, schools, societies, or associations. This is particularly true for community WaSH initiatives. For example, strong social has been linked to collective action around environmental challenges including WaSH in a rural Kenyan community (Bisung, Elliott, Schuster-Wallace, Karanja, & Bernard, 2014).

**Social capital:**

“the aggregate of the actual or potential resources that are linked to possession of a durable network”. (Bourdieu, 1986, p. 248)

### MULTI-STAKEHOLDER AND PARTICIPATORY APPROACHES

Multi-stakeholder engagement should happen within and between sectors (health, water, wastewater, public health) and stakeholders (researchers, policy makers, technology providers, private sector, practitioners, community members). The goal is to bring all of these actors to the table to encourage sharing of knowledge and decision-making. This means ensuring that everyone participates in, and contributes to, all stages of research, planning, and implementation. Multi-stakeholder engagement can happen through different means: committees and working groups, stakeholder workshops, or public information sessions (Holland, 2007).

The success of multi-stakeholder engagement lies in the diverse group of actors recognising that each individual has their own knowledge and set of values that they bring to the table and that combined, they create a richer knowledge base from which better decisions can be made (Holland, 2007). Furthermore, all actors involved should recognise each other’s contributions equally and work in a collaborative manner as opposed to a prescriptive manner, where those with more power impose their views and knowledge on those deemed ill-informed (Weichselgartner and Kasperson, 2010). This process also empowers neglected stakeholders and those who do not have the confidence to voice their opinions (Holland, 2007; Njie & Yocarini, 2006). Having all stakeholders participating in the decision-making process creates a greater sense of ownership, which leads to sustainability. Additionally, if stakeholders are all equally invested in a decision, they have equally more to gain (or lose) from an outcome (Njie & Yocarini, 2006).
This approach can be successful because it creates a transparent and inclusive decision making process, which can secure trust between actors. However, in order for this approach to work, there needs to be a willingness and openness to listen and learn from all involved, irrespective of their position in society. By doing so, mutual respect and trust is developed (Edelenbos et al., 2011). Moreover, all parties involved can gain a common understanding of the information being shared and work timeframes (Weichselgartner & Kaspersion, 2010). One way to promote collaboration and participation among the different actors is to budget adequate time and encourage communication (Young, 2005), which can happen through regular, well-planned meetings that help keep everyone aware of what is happening.

BEHAVIOUR CHANGE

Promoting changes in behaviour, particularly behaviours that are strongly habitualised or naturalised, can be seen as akin to a process of conversion that entails intervening in and re-directing path dependent practices. It is not so much about getting people to make different choices or decisions so much as, more fundamentally, getting them to see their actions in terms of choice and decision-making. So what might seem to be a relatively small re-adjustment in behaviour, such as getting someone to wash their hand with soap before handling food or after defecating, involves a much more significant process of re-cognition, re-valuation, and re-orientation to self and behaviour.

Social change is often linked to social movements. Collective behaviour reveals the otherwise hidden tendencies of the individuals who take part in the episode; crowds amount to a convergence of like-minded individuals (Allport, 1924). In participating in group activities, the sense of individuality can be lost, overcome by a group mindset (LeBon, 1924). Collective excitement and contagion can result in positive change, or social unrest and riots. Because rules within the group can be made as they go along, the group itself can produce distinct behaviours and practices (Turner & Killian, 1972). The key is how to use these collective transitions to produce the changes in behaviour desired. To be successful, groups must first organise and then acquire and deploy resources (material, moral, human, and cultural) to achieve their goal (Bisung & Elliott, 2014).

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To be effective, collective impact must consider who is engaged, how they work together, and how progress happens.

(Kania et al., 2014, p. 2)
The process of conversion can also be seen in terms of the language of economics, of supply and demand. On the ‘push’ side, change is supplied through the availability of opportunities, resources, and material infrastructure that make the adoption of new practices as convenient, effortless, and low cost as possible. On the ‘pull’ side there has to be a demand for change, and this is generated in large part through promotional/advocacy communication. However it is framed, sustainable and sustained behaviour change has the following pre-conditions and elements:

- Any aspect of health promotion, such as water disinfection or personal hygiene, must be framed holistically, as part of an overall ethic of wellbeing.
- Effective communication needs to be institutionally embedded. In the case of health promotion, the message should be communicated through institutions such as local community health clubs.
- New practices can be reinforced and sustained by embedding them in local institutions that continue to reiterate the message and provide social support and validation.
- Institutions, like local health clubs, which embed effective communication should be organised and operated autonomously by their own community-based members with professional/expert input and consultation.
- Local institutions provide support in helping to reduce the social risks people can face when they begin to act differently, especially if acting against tradition.
- Irrespective of how beneficial new practices are, they have to be legitimised, which means recognising and defusing any social, cultural, or even political threat that they may initially pose.

COMMUNICATIONS AND ADVOCACY

The success of advocacy communication in promoting the demand for social good depends on multiple considerations.

1. **Issues of social good involve the messenger as well as the message.** This has implications for delivery mechanisms because while mediated communication (print, electronic, and digital media) is effective at gathering and widely distributing information, it is less effective than inter-personal communication at ensuring the translation of information into practice. Furthermore, a message is more likely to be believed and acted up on when delivered by someone whose identity is close to that of the target audience. This is particularly the case when the cultural epistemology of the audience differs from the basis of the information and knowledge that legitimises the desired change in behaviour, such as modern scientific rationalism.

It is important to remember that the scientific knowledge behind changes for social good is, like the vast bulk of scientific knowledge, experimentally derived and technologically mediated rather than experiential and socially mediated. As such, it may not resonate easily in cultures where experiential, directly derived knowledge prevails; cultures that are relatively un-technological.

2. **Different media are good at doing different things, so, all available channels and platforms should be used to communicate the message.** However, the message must be consistent so that each channel/platform refers to and reinforces all of the others. The goal is to generate a cycle of self-validating, self-reinforcing communication that crowds out alternative ways of thinking and acting. Communication also has to be continuous - the message has to be sustained.
over time in order to sustain new practices over time, until they become second nature. Research has shown that when change sponsors such as NGOs, researchers, and health professionals leave, people often lapse back to their former ways. The presence of change sponsors can have a strong impact in convincing people to adopt new practices. However, once they are no longer present, the source of reinforcement and validation they provided also disappears.

3. Promotional or advocacy messages seeking to persuade people to change their behaviour can be framed positively, negatively, or a mix of both. The question is how to decide whether one is pro-something (a solution) or anti-something else (a problem)? Positive framing accentuates the benefits or gains that change will bring, while negative framing accentuates the costs and threats of continuing the status quo. This framing choice or dilemma speaks to the normative (ethical and moral) and emotional, as well as practical dimensions of communication.

There is no right or wrong answer since the message framing will depend on both the action required and the audience targeted. Positive messages are more effective when they add a sense of responsibility to and benefits for others; direct self-interest messages are not as effective. Another approach is to attach benefits to other adjacent values such as linking hygiene to attractiveness, likeability etc. In this manner sources of pleasure are linked to instrumentally effective behaviours and objective conditions are translated into subjective feelings. This translation of objective reality into subjective feeling and experience is crucial to any conversion, especially when it tends to be a future promise; and, the fact that harmful consequences of current practices may not be seen as particularly salient or problematic by the target audience, especially when there are plenty of other, more serious things that we have to worry about! People typically rank their problems (and those of their loved ones/dependants) in terms of the seriousness and immediacy of their impact. This determines the amount of psychological and physical energy they devote to managing them. In practice, the hierarchy of problems is a way of managing the limited caring capacity that people have: what are considered minor problems are often ignored as much as possible, particularly if they are chronic, but not immediately threatening.

As a result, some degree of negative framing – why current behaviour is seriously problematic and should be eliminated or replaced – is usually unavoidable. But negative framing also has its challenges, as the message becomes one of risk and fear, or contamination and disgust. To fear a risk requires a more or less conscious calculation, but this also allows for some element of uncertainty that may weaken adoption of, and attachment to, desired changes in behaviour. One can accept the knowledge behind the identification of a risk as valid, yet still decide to take one’s chances and carry on as usual. On the other hand, contamination-framing and disgust-framing highlight the fact that promoting one form of behaviour also means discrediting, devaluing, and stigmatising another form of behaviour. As such the challenge is primarily an ethical one; labelling behaviour as disgusting can easily become socially divisive when it develops into stigmatisation (shaming, shunning, ridiculing) of those who do not change, as disgusting. There is often a fine line between behaviour and social identity, between practices and practitioners. Use of disgust as a rhetorical device has to keep this squarely in mind.
Experience shows that, when dealing with “wicked” social development problems, progress and scaling up of successes can be extremely difficult. Due to the diversity, complexity, and interdependencies of factors (Figure 2) WaSH is classified as a “wicked” problem and as such difficult to solve. To scale up successful and sustainable WaSH solutions, we believe that it is necessary to fully grasp (i.e. navigate, chart, and calm) the complexity of the WaSH “Mucky Middle”. Lessons from local development and the MDG process point to the importance of integration, good governance, and personal ownership. Human health and wellbeing is multi-faceted. It cannot be distilled down to simply the presence or absence of disease. As defined in the Ottawa Charter (1986), health is “a resource for everyday life, not the objective of living”. Water and sanitation access is a key pillar of health, contributing to reductions in disease, poverty, and environmental degradation.

It is extremely timely to envision WaSH and wellbeing into the future within the context of a process and network that is founded in policy-practice-research and which aims to transform the way in which knowledge is generated, shared, and utilised (Figure 3). Short-term strategies must be embedded within long-term goals in order to align required progress with political timelines. For example, the long-term goal of universal access can be achieved in a stepwise progression through regulations which first ensure that public buildings are built with specified water and sanitation/wastewater services and second, require retrofitting for existing public buildings.

Catalysing change in the WaSH sector begins with individuals who believe that they can change, understand how to change, and want to change. Individuals go on to motivate and drive change in their households, communities, and institutions. These basic principles for change are the cornerstone for creating impact in WaSH and wellbeing needed at the global scale.

Harnessing the “Mucky Middle” requires the following key strategies:

- Facilitate the transfer of knowledge of low-cost water and sanitation solutions;
- Establish political will in order to create and sustain change;
- Build the human, institutional, and political capacity to implement these low-cost solutions;
- Motivate organisations, at all levels, into action to provide water and sanitation for the poor; and,
- Innovate, evaluate, learn, and repeat.

When people know that it is the water that is making their families sick, and that there are simple solutions that can be implemented immediately, they “believe in change, know how to change, and want to change”. This process requires top-down support; a sustainable WaSH framework that

Figure 2: Essential Elements to WaSH and Wellbeing
consists of good governance and integrated water resources management including policies, regulations, and oversight, financing, and supply chains.

If we can navigate the “Mucky Middle”, then we can improve our response to the WaSH crisis. We know that there are significant health benefits from improved access to water and sanitation, not least of which is the reduction in morbidity and mortality, but larger ripples include improvements in education and economic activity. The following are what we believe compose the multiple facets of navigating the “Mucky Middle”.

There is a “Mucky Middle” and more attention needs to be paid to harnessing it.

Figure 3: Transforming and Harnessing experiences
FRAMING

- Embed the right to water and sanitation in all aspects of WaSH development.
- Undertake an adequate diagnosis of the problem, including key limitations and stakeholders and their relationships.
- Adopt a more holistic and integrated approach that identifies and addresses technical, human, institutional, policy, and financial resources and limitations.
- Utilise a multi-stakeholder approach that enjoins policy, practice, and research in defining the nature of the problem, the dimensions of the problem, the history of the problem, and previous efforts and outcomes.
- Clearly articulate roles and responsibilities, even if the roles and responsibilities themselves are complicated.
- Funders and policy-makers need to understand the transdisciplinary and transectoral nature of the research required; practitioners need to shape research agendas; researchers need to incorporate research strategies that meet the needs of both practitioners and policy-makers.
- Accountability and transparency in the “Mucky Middle” are critical to secure trust between actors and strengthen partnerships.
- Community and public participation is essential to facilitate transparency and accountability through mechanisms such as citizen report cards and public hearings.
- Sufficient resources (financial, time, and expertise) must be allocated to social processes and will serve to increase accountability and transparency between partners in the “Mucky Middle”.
- Recognise and neutralise (to the extent possible) power inequities so that true integration can be achieved, including between men and women and decision-makers and beneficiaries.
- Build upon experiences and evidence to co-learn and adapt.
- Ideological drive is a necessary ingredient for success.
- In order to change the system, you have to be part of the system.

ENGAGING AND EMPOWERING

- Be respectful.
- Establish mechanisms that engage actors within and between sectors and stakeholder groups (health, water, wastewater, public health, technology providers, and policy-makers).
- National, regional, and global networks can play an important role in policy development.
- Where women’s voices are heard, they are strong advocates for potable drinking water, sanitation, and hygiene practices.
- Empower actors through information and knowledge.

Communication is as much about listening as it is about sharing your knowledge

COMMUNICATING AND EDUCATING

- Understand what motivates.
- Recognise that people affected often question the commitment of responsible government departments, believing that they are not valued and that priority is not given to their problems.
- Individuals at all scales and across all sectors need to understand the water and sanitation crisis and advocate for change.
- The greater the understanding of the risk, the greater the likelihood of changing behaviours and practices.
- Communicate what is known to others who need to know.
- Acknowledge that there are different levels of knowledge and different languages used between actors.
- Terminology, and lack of understanding of that terminology, freezes trans-disciplinary, trans-sectoral, multi-stakeholder chains.
• Invest in creating a shared language with common reference frames and stories; new words can cut through entrenched paradigms e.g. anecdata – recognising the need to measure and present qualitative AND quantitative evidence.
• Implement education programs to change behaviour and attitudes.
• Capture and build indigenous knowledge about use of water and managing resources.
• Transfer basic skills and knowledge of WaSH and wellbeing (local capacity) between, as well as within, communities through train-the-trainer and community programs.
• Core capacities are fundamental across many sectors and scales of government (management, oversight, and regulation, impact assessment, financial management etc.).
• Train trainers in order to provide local capacity for development.
• Provide capacity for people to create their own knowledge and their own visions.
• Children can be a point of change for households and communities.
• Social maths and infographics can be worth a million numbers.
• Communication is a process leading to saturation that requires consistent and frequent messaging across multiple modes (drama, music, written, spoken, visual etc.) to be successful.
• The messenger is as important as the message.
• Enlist prominent spokespersons and advocates to increase legitimacy.
• Messages must be packaged correctly for different stakeholders.
• Use different ways to communicate known, evidence-based incentives.
• Using social marketing tools to bring about social change.
• Harness knowledge, rather than becoming a slave to it.

SOLVING

• Invest in generation, validation, and implementation of innovative solutions.
• Ensure mechanisms are in place that retain good strategic ideas in operationalisation.
• Find value in what does not work in order to learn and grow.
• Exploit opportunities and overcome barriers.
• Invest in “frugalising” proven technological solutions for resource poor contexts.
• Provide solutions that are appropriate to the context, rather than cookie cutter approaches.

Innovation - using what we have, where we are, to solve problems that we face … there is no innovation if ethical and equitable change has not occurred.
(Workshop participant)
MONITORING AND EVALUATING

- In order to change policy we need to prove the impact from our actions.
- Measurements are indicators and not reality – work towards the underlying condition.
- Give equal weight to qualitative and quantitative evidence – there is more to a situation than the numbers can explain.
- Case studies contain powerful qualitative evidence and multiple case studies reinforce conclusions.
- Ask the right questions of the right people.
- Use a strength-based approach, rather than focusing on deficits or deficiencies.
- Ensure capacity and mandate for monitoring.
- Triangulate data to ensure that the interpretation is correct.
- Make disaggregated data (e.g. age, sex, occupation) broadly available in a timely manner to assess progress.
- Important metrics include stewardship, leadership, resources allocation, health system data, service delivery, and community integration.
- Require compound metrics for genuine progress (impact and change) linked to process / progress indicators e.g. combined economic development and social capital.
- Outcomes can take generations to realise and understand.
- Sustained and sustainable change is only possible if institutionalised in policy and practice.
- Strong, linked, and resourced institutions have an obligation to recognise and support the policy-practice-research nexus.

SUSTAINING

- Policy must support and resource the capacity required to support and sustain change.
- Cultivate understanding, respect, acceptance, and humility so that we experience a common sense of unity and achievement.
- Maintain and strengthen relationships through networking to support commitment, continuity, and communication.
- Social norms take time to change.
- Establish advisory boards and commissions.
- Consider the local characteristics (income, language, literacy, culture) in scaling up and out.
- Ensure sufficient capacity and specific mandates.
- Reduce risks by checking information before going to policy-makers, consulting the stakeholders, and being clear in what is being offered.
- Traditional knowledge is critical to sustainable solutions, but can be slow to adapt to external drivers.
- Incentivise and enforce.
- Create a sense of ownership, responsibility, and collaboration through co-creation, co-management, and co-ownership of successes and failures.
- Institutionalise proven solutions.
- Establish good operation management practices for water and sanitation services that cannot be compromised through corruption.
- Inspire action in others.

Bad news always spreads further and faster than good news.
Given that:

- WaSH intersects with all aspects of development;
- Inadequate WaSH provisions undermine success in other development sectors;
- Public, private, government, and civil society sectors are stakeholders in WaSH;
- Policy and practice in WaSH aspire to be evidence-informed;
- WaSH strategies need to be characterised by harmonised local -> national -> global action with common, but differentiated, responsibilities;
- Equity in WaSH should be our goal by emphasising underserved and vulnerable populations (especially rural populations);
- Sustainable solutions are characterised by the ability to scale up and out; and,
- Outstanding commitments to WaSH improvements must be honoured.

We propose the following functional framework (Figure 4) that:

- Recognises and accepts WaSH as central to development, economic growth, human wellbeing, and environmental integrity;
- Recognises and incorporates progressive realisation of the right to drinking water and sanitation;
- Provides a way to co-ordinate external and domestic resources with civil society action;
- Provides a pathway for changes to the roles and priorities of national governments, whether donors or recipients, to prioritise WaSH in national agendas;
- Emphasises the importance of enabling environments for WaSH; and,
- Provides a framework for a strength-based approach to development that links policy and practice to research.

The bottom line is that, in doing development differently, it is possible to creatively link WaSH to other development issues to increase support and delivery (e.g. energy, food security) and to leverage private sector engagement, social enterprise, and shared values. Private sector involvement is important not only because of the resources that are brought to the table, but also the opportunity to selectively learn from how it tackles problems.

Innovations for securing sufficient resources include leveraging sick days to prompt/justify investments in community wellbeing, split pricing models and bottom of the pyramid investments, and mechanisms to trade on social returns on investments. Social media technologies are not only important for communicating messages, but for crowd sourcing funds and other resources.
Figure 4: Navigating the “Mucky Middle”/ Development done differently
CONCLUSIONS

We can no longer over-promise and under-deliver if, as a global community, we are genuinely committed to improving the health and wellbeing of the most vulnerable of the citizens of the world. Clear goals and targets for improving WaSH access are embedded in Agenda 2030. In an approach that holds equity and universality paramount, targets do not differentiate between countries or place of use (home, work, health care facility). In addition to encouraging the amelioration of the deprivation of rural, remote, and marginalised communities, implementation must take into account the latest technological advances that allow maximum improvement. Equally, we must consider the sociocultural factors that will make or break any changes. Globalisation influences wastewater production, private sector water management, international environmental and water treaties and their cross-border enforcement, and the unregulated exploitation and corruption of natural resources. The net result may foster a push for more effective management of water resources, which are supported by international financial and environmental sustainability initiatives in response to the increasing demands for international accountability of governments, NGO’s, and private sector organizations. Innovative financing models that highlight small investments that may produce large changes (e.g., development of small biogas initiatives) have the potential to capitalise on change.

To ensure scalable and sustainable development in the WaSH sector, there is a need for a different mind-set that recognises and unlocks the complexity of the intersectoral, interagency, co-operative strategies needed to ensure universal WaSH access. This requires:

- Agreement with the statement of values that drinking water and sanitation are a human right;
- Appropriate and affordable interventions (policies, legislation, infrastructure, technology, and behaviour change) that provide, prevent, mitigate, and scale;
- Stable financing mechanisms;
- Readiness for change at all scales and a stable environment within which this change can occur;
- Political will backstopped by capacity, investment, and supply chains; and,
- A path through competing politics, priorities, geographies and belief systems.
All external stakeholders (donors, private sector, domestic government, NGOs, research groups) must be accountable not only to themselves, but also to national and global WaSH priority strategies, and harmonised policies and regulations and the people who most need help to change their states of living. From a practical perspective, co-ordinated, dedicated global funds, such as the Global Sanitation Fund, provide one-stop financing and expertise, while national NGO registration databases provide a parallel implementation co-ordination mechanism. Moreover, these mechanisms facilitate knowledge sharing and knowledge translation. No public facility, especially financed through external funds, should be constructed without full access to potable water and appropriate sanitation facilities; water treatment plants should not be constructed without a delivery mechanism in place; and, water should not be supplied without consideration and treatment of wastewater generated.

This will ultimately lead to a world in which it is recognised that soap is cheaper than medicine, outcomes and impacts cannot be arbitrarily linked with political timelines, and, most importantly, innovation means solving our problems where we are, with what we have. This is doing development differently.
REFERENCES


