

Health Policy Approaches to Investment in Water, Sanitation and
Hygiene (WASH) Infrastructure

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A thesis
submitted in partial fulfillment of the
requirements for the degree of

Master of Public Health

University of Washington

2021

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Abstract

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As part of the Sustainable Development Goals introduced by the United Nations in 2015, SDG 6 aims to achieve environmentally sustainable and equitable water, sanitation, and hygiene accessibility for all. WASH-focused policies produced by health organizations use SDG 6 to guide their strategies for investments in WASH infrastructure from many different angles (i.e., capacity-building, policy and advocacy, direct financial support), but there is still a lack of transparency in the roles and responsibilities of key health organizations due to the complexity behind WASH-related problems. This research investigates the WASH strategies of four leading organizations (UNICEF, WHO, Joint Monitoring Program, World Bank) that analyzes both the apparent investment roles and associated WASH infrastructure as well as the fundamental driving values that each organization displays in their strategies. Through an inductive qualitative study design, thirty-seven publicly available strategy documents and two in-depth interviews were collected and analyzed. The results were summarized into two parts: code frequency analysis and thematic analysis. The code frequency analysis revealed variable WASH infrastructure investment preferences but similarities in capacity-building and policy and advocacy roles between UNICEF and WHO, predictable roles in WASH monitoring for JMP, and direct financial support for the World Bank. The thematic analysis demonstrated that most of the policies (~60%) included in the study showed integrated values such as equitable WASH access in tandem with the conservation of the natural environment. However, ~30% of the policy was defined by singular values of either human health, the natural environment or social equity and only a very small percentage integrated all three of these values. In order to more thoroughly achieve the integrated nature of SDG 6, the policies of these organizations should aim to become more integrated if they are to meet the WASH demands of global populations.

INTRODUCTION

Water, sanitation, and hygiene (WASH) infrastructure policies and standards made by global water sector leaders can heavily influence investments in WASH infrastructure, contribute to how these services are accessed, and subsequently the health outcomes experienced by global populations. Current water and sanitation infrastructure is inadequate in many areas of the world to meet the basic drinking water, sanitation and hygiene needs of human populations. Global monitoring and surveillance efforts have shown that while progress has been made, there are still severe knowledge gaps and challenges that exist to universal access and coverage.¹⁶ The formation of the United Nations' Millennium Development Goals and then the Sustainable Development Goals in 2015 has been an important step in further recognizing the global responsibility to address issues contributing to the determinants of poor health such as ineffective and inadequate water and sanitation infrastructure. The strategies of global health organizations are therefore driven in part by meeting the MDGs¹ and more recently the SDGs. SDG 6 says, "Ensure available and sustainable management of water and sanitation for all."¹⁵ Policies and standards made by global organizations influenced by SDG 6 can heavily influence investments in WASH infrastructure, contribute to how these services are accessed, and subsequently the health outcomes experienced by populations around the world. It is well known that effective WASH infrastructure is essential to human well-being and importantly contributes to reducing water-borne diseases, deaths, and social inequities associated particularly with poor sanitation and water supply.^{3,4,7} According to an analysis from 145 countries conducted in 2016, adverse health outcomes resulting from inadequate water and sanitation infrastructure have contributed to 1.6 million deaths worldwide, and 105 million Disability-Adjusted Life Years (DALYs), amounting to a quantifiably large and preventable burden.¹³ Furthermore, several studies published over the past several decades, have demonstrated that WASH interventions involving the implementation of improved water and sanitation systems, water quality, and water supply show a reduction in the prevalence of associated illnesses, malnutrition, and infant mortality.^{6,7,8,17} By alleviating much of the social and physical health disparities, proper investment in better WASH infrastructure has the power to significantly benefit livelihoods and economies.⁹

Key agencies and initiatives such as UNICEF, WHO, the World Bank and the Joint Monitoring Program (JMP) are in leading positions where they have the health knowledge and data to inform infrastructure decisions by pulling many sectors together to create robust solutions. However, the more specific roles, responsibilities, and strategies behind these intersectoral solutions have remained unclear due to the complex nature of WASH-related problems and solutions. One apparent question arising from is how this theoretical cascade from SDG 6 to policy to on-the-ground infrastructure is currently reflected and represented in the WASH strategies of leading global health organizations. This question fueled the development of two research aims. First, how do the policies of large, multilateral health organizations describe and invest in global WASH infrastructure? Then, as themes began to emerge a secondary aim developed: To what extent are these WASH investments driven by core values of ensuring health, protecting the natural environment, pursuing equity, or a combination? This research evaluates the health policies of UNICEF, WHO, World Bank and JMP to further understand the motivations behind WASH strategies and how those motivations translate into different levels of investment, even beyond financial support. Additionally, as the global demand for resilient WASH infrastructure increases, increasing the transparency behind WASH strategies developed by these organizations may provide insight into how closely aligned they are with SDG 6 and potentially identify future areas of investment for the successful achievement of water and sanitation for all by 2030.

METHODS

To properly assess the roles and strategies that health organizations employ around WASH, publicly available strategy documents from UNICEF, WHO, World Bank, and the Joint Monitoring Program (JMP) were identified and analyzed. The full process of this project is detailed in the following subsections: Research Design, Data, Analysis and Limitations.

Research Design

The four organizations and partnerships selected for this project are the largest leading authorities that hold the most influence within Goal 6 of the SDGs, which is specifically aimed at ensuring access to water and sanitation for all. Smaller organizations were excluded since it was assumed that they followed the leadership, standards, and guiding principles of the mentioned agencies. An inductive qualitative analysis was performed on all documents collected, reviewed through an intercoder agreement process, and then analyzed for conclusions. Descriptions for each type of strategy document are detailed in the **Data** subsection and a complete list of documents included in this study can be found in the Appendix. A second component of the project design was to recruit key informants who represented these organizations and conduct in-depth interviews. Interviews served to supplement the document analysis and were aimed at both understanding more details and revealing parallels behind an organization's strategy and the resulting investments made in WASH. Key informants working at different levels in the organization were thought to provide essential perspectives related to how the organization's policies, goals and practices translated on the ground.

Data

A total of thirty-seven documents were found and downloaded through an Internet search or through websites that have integrated archives or databases. These included the UNICEF document portal, the WHO document portal, the World Bank document archive, and the JMP reports archive. The complete list of documents can be seen in Table 1 (links to all documents can be found in the appendix) below in addition to more in-depth descriptions of each document group.

UNICEF strategy notes: These documents are specific to country programs outlining current conditions, desired future goals, and specific action items to meet future goals. Usually produced before implementation, these documents can be broken down into categories such as health, WASH, child protection, social inclusion, among others. This was the first document group to be considered since UNICEF is a well-known global leader in on-the-ground WASH efforts.

The WHO WASH strategy document: As with UNICEF, the World Health Organization is a leader in global health standards and guidelines and has published plans regarding the organization's role and goals in the WASH sector in one single document. This is a recent publication and was chosen because it is the most comparable document to the UNICEF strategy notes. Although not country specific, the document contents are similar and future-oriented, outlining a plan for the next several years.

The Joint Monitoring Program (JMP): The Joint Monitoring Program (JMP) is a data-driven monitoring and surveillance partnership between UNICEF and WHO. Active since the 1990s, the JMP has developed WASH indicators related to WASH access that are monitored annually. JMP data gives insight into

improvements made over the last few years that can potentially be compared to their respective strategy documents.

World Bank infrastructure strategy and Country Partnership Frameworks: The Infrastructure Strategy document describes the overall strategy of the World Bank with regards to infrastructure, not limited to water, sanitation and hygiene, and how global infrastructure relates to economic growth and sustainability. The Country Partnership Frameworks expand on the infrastructure strategy. The World Bank does not define themselves as a health-focused agency, but they do have enormous influence in global infrastructure development and important to include for that reason.

Document Number	Document Type	Organization	Date Range
1	Global Strategy	UNICEF	2016-2030
2	Myanmar Strategy Note	UNICEF	2018-2022
3	Bangladesh Strategy Note	UNICEF	2017-2020
4	Bolivia Strategy Note	UNICEF	2018-2022
5	Vietnam Strategy Note	UNICEF	2017-2021
6	Papua New Guinea Strategy Note	UNICEF	2018-2022
7	Ukraine Strategy Note	UNICEF	2018-2022
8	Kyrgystan Strategy Note	UNICEF	2018-2022
9	Lao PDR Strategy Note	UNICEF	2018-2022
10	Mongolia Strategy Note	UNICEF	2017-2021
11	Pacific Islands WASH Strategy Note	UNICEF	2018-2022
12	Sao Tome and Principe Strategy Note	UNICEF	2017-2021
13	Ghana Strategy Note	UNICEF	2018-2022
14	State of Palestine Strategy Note	UNICEF	2018-2022
15	Mozambique WASH Strategy Note	UNICEF	2017-2020
16	DPR Korea Strategy Note	UNICEF	2017-2021
17	Cameroon WASH Strategy Note	UNICEF	2018-2020
18	Cote d'Ivoire Strategy Note	UNICEF	2017-2020
19	Moldova Strategy Note	UNICEF	2018-2022
20	Somalia WASH Strategy Note	UNICEF	2018-2020
21	Somalia Health Strategy Note	UNICEF	2018-2020
22	South Sudan Strategy Note	UNICEF	2016-2018
23	Morocco Strategy Note	UNICEF	2017-2021
24	Jamaica Strategy Note	UNICEF	2017-2021
25	Montenegro Strategy Note	UNICEF	2017-2021
26	Oman Strategy Note	UNICEF	2017-2020
27	Guyana & Suriname Life-long Learning Strategy Note	UNICEF	2014-2018
28	Guyana & Suriname Child Protection Strategy Note	UNICEF	2014-2018
29	Thailand Child Development Strategy Note	UNICEF	2017-2021
30	Thailand Education Strategy Note	UNICEF	2017-2021
31	Global Infrastructure Strategy	WB	2018-2025
32	Fiji Country Partnership Framework	WB	2021-2024
33	Nigeria Country Partnership Framework	WB	2021-2025
34	Bhutan Country Partnership Framework	WB	2021-2024
35	Global Strategy	JMP	2016-2020
36	Global Strategy	WHO	2018-2025

Table 1. Complete list of documents with affiliated organizations and target years for strategy implementation.

For the interview portion of the project, a formal IRB process was conducted to get approval for collecting and analyzing interview data. Once approval was granted, initial recruitment for interviews began through a convenience sample by colleagues who worked in organizations included in the project. Once the first contact was made, a snowball sample of additional participants quickly followed as network connections to WASH and health colleagues in other organizations. A total of two interviews were conducted through recorded Zoom calls ranging from 45 minutes to 1 hour and 15 minutes that were transcribed through *Otter.ai* transcription software and analyzed using the same codebook that

was used for the documents. A total of seven semi-structured main interview questions were formed with two to three follow-up questions attached to each main question. The full list of interview questions can be found in the Appendix. Since the recruited participants included both high level WASH specialists and members from country teams, these questions were designed to be adaptable to many interviewees in various positions throughout each agency. An example is detailed below.

Main: *How would you describe the role that your organization plays in water, sanitation, and hygiene infrastructure in relation to health (i.e., health facilities, schools, communities)?*

Follow-up: *Is there an infrastructure implementation aspect to what you have described that your organization handles directly?*

Follow-up: *What dictates the direction and subsequent actions that your organization takes with water and sanitation infrastructure?*

While these interviews supplemented the document analysis, they were not included in the results and only used to inform the implications of the conclusions made as well as future directions for research.

Analysis

All documents were compiled and uploaded individually for coding using the software *Atlas.ti Version 9.0.7*. The detailed codebook was constructed based on an inductive qualitative coding process that categorized codes into primary, secondary and tertiary codes (see Figure 1). Primary codes served as conceptual buckets that captured text relating to broader themes identified in the project such as *Investment in WASH infrastructure* and *Role of Organization*. Secondary codes included more detailed titles that pertained to specific, and sometimes more technical aspects of WASH that tied back to the conceptual primary code. Within *Investment in WASH infrastructure*, for instance, secondary codes like *Drinking water*, *Health*, and *Health facility* helped describe the nature, environment, or intended target of the investment that the text described. In the case of actual infrastructure implementation goals, more technical secondary codes under the primary *Infrastructure Implementation* were added to increase specificity of infrastructure and which kind of technology was being prioritized for which end goal. Furthermore, if identified, this infrastructure was sometimes coded with factors that were often found associated with WASH such as education, food security, equity issues, and poverty reduction. Another layer of codes included priorities and actions in policy, capacity-building, advocacy, and monitoring and surveillance that were all coded as roles each organization employed in their WASH strategies. To fully capture the distinct content in each document, attaching primary codes to text was mostly avoided if they also contained secondary and tertiary codes. Finally, to aid in the coding process, “health” was defined as physical absence of disease or illness. However, depending on the cultural context, there are many more expansive definitions of human health and well-being that were excluded from this coding process.

The documents were coded first in the same consistent manner by the primary coder. To validate the coding process, intercoder reliability checks for a select number of documents were performed through a secondary coder who used the expanded codebook. These documents and excerpts were selected because they contained a high concentration of information about WASH strategies and encompassed a relatively large number of codes in a small amount of text. Intercoder reliability checks were performed in three cycles throughout the coding process and the coded documents and codebook were revised accordingly. A subset of four documents was chosen for the first round, two documents for the second round and three for the final round. Within each document, the quotations identified by the primary coder were kept in place, but the codes were unlinked from all quotations. The secondary coder then

assigned codes to the quotations using the updated codebook. Once intercoder reliability reached a satisfactory agreement level, the rest of the unshared documents were revised with the updated codebook and the process was discontinued.

FINALIZED CODEBOOK

- I. Challenges to WASH infrastructure
 - a. Socio-political conflict
 - b. Climate change
 - c. Natural disasters
 - d. Water resources
 - e. Urbanization
- II. Infrastructure Implementation
 - a. Rehabilitation of WASH facilities
 - b. Desalination
 - c. Latrines
 - d. Wastewater reuse
 - e. New infrastructure technology
 - f. Resilient WASH infrastructure
- III. Collaboration
 - a. Private investment in WASH
 - b. Public investment in WASH
 - c. Public-private partnerships
 - d. Coordination between agencies
 - e. Intersectoral collaboration
- IV. Investment in WASH infrastructure
 - a. Hygiene behavior
 - b. Community engagement
 - c. Drinking water
 - d. Health facility
 - e. Health
 - f. Humanitarian response
 - g. Sanitation
 - h. Wastewater
 - i. Rural Urban
 - j. Infrastructure co-benefits
 - i. Education
 - ii. Food security
 - iii. Equity
 - iv. Poverty reduction
 - v. Renewable energy
- V. Role of Organization
 - a. Capacity-building
 - b. Financial support
 - c. Policy and advocacy
 - d. Water sector leader
 - e. WASH monitoring and surveillance
- VI. Inadequacy of current WASH systems
- VII. WASH strategy link to MDGs/SDGs

THEMES

- I. Health
- II. Environment
- III. Society
- IV. Health/Society
- V. Health/Environment
- VI. Environment/Society
- VII. All Three

All quotations under each code were assigned themes I-VII. Excerpts that did not fit a theme were excluded from this portion of the analysis.

EXAMPLE

DOC: UNICEF Palestine Strategy Note (No. 19)
 CODE: Wastewater (8 total occurrences)

THEME	QUOTES	SUM
Health	19:88	1
Environment	19:47	1
Society	-	0
Health/Society	19:44 19:87	2
Health/Environment	19:25 19:67	2
Environment/Society	-	0
All Three	19:30 19:39	2
None	-	0

Figure 1. A condensed version of the final codebook used for analysis with an example of how themes were assigned by code.

Cohen's Kappa was used to measure intercoder reliability throughout each of the cycles, and only the Kappa measure from only the last cycle was included in the results. Kappa score analysis was guided by

the classic agreement standards identified by Landis & Koch,^{2,8} with the goal of reaching substantial agreement ($0.61 < \kappa < 0.80$).

The next phase of analysis included identifying trends in the coding. Summaries of the frequencies of code occurrence by organization were produced, which provided a preliminary basis for comparison between health organizations. Further analysis was performed by categorizing all coded text into three themes based on the particular context in which WASH was perceived or discussed within each document. These themes were *Health*, *Environment*, and *Society/Culture*, and were named later in the coding process as they emerged with more clarity. The *Health* theme categorized text if it described investment in WASH as clearly health-focused or motivated from primarily a human health goal (i.e., reduces the disease burden in children, etc.). Text was categorized into the *Environment* theme if it described investment in WASH as motivated by conserving the natural environment, specifically with protecting water resources and perhaps in the context of climate change. The final theme, *Society*, was relevant to text that described investment in WASH as focused around social, political, economic, or cultural equity such as improving social disparities from poor menstrual hygiene infrastructure. The text included in this analysis was assigned either one, two or all three themes. Sections of text that were too ambiguous were excluded from this analysis. Documents that contained fewer than three coded quotations were also excluded from the analysis, leaving a total of twenty-seven that were included. Comparisons were drawn between organizations once all relevant text was categorized in this manner.

Limitations

The limitations of these research methods can be summarized into two main components: the document analysis and the in-depth interviews. Although the document analysis contained a long list of strategy documents, these were mainly sourced from UNICEF, so the results are heavily influenced by the content in UNICEF strategy notes. Consequently, the analysis may not accurately reflect collective trends in WASH seen in other health organizations included here. With regards to the in-depth interviews, there were complications with recruitment during the onset of the COVID-19 pandemic that prohibited gathering more interviews from key informants. While two were collected, the initial goal of twelve interviews to supplement to document analysis was not achieved. Future work may include reaching out to more key informants and collecting at least ten more interviews from all organizations to create a more robust and informative dataset.

RESULTS

The results are presented in two components: code frequency analysis and thematic analysis. A Kappa score of 0.768 was reached after the third cycle of intercoder reliability checks, which enabled grouping codes into results presented below.

Code Frequency

Table 1 shows the codes that occurred with the most frequency across all organizations. For organizational roles relating to WASH, the most common included *Capacity-building*, *Policy & advocacy*, and *WASH monitoring & surveillance*. The most common aspects of WASH included *Equity*, *Education*, *Hygiene behavior* and *Health*. However, this data is clearly dominated by UNICEF, which shows the highest counts. To highlight the most common codes by each organization, sub-tables A-D in Table 2 are included below.

CODE	UNICEF	WHO	JMP	World Bank	TOTAL
Capacity-building	191	52	7	6	256
Policy & advocacy	184	35	0	3	222
WASH monitoring & surveillance	95	32	14	4	145
Equity	131	1	0	6	138
Education	125	6	1	0	132
Hygiene behavior	113	2	0	1	116
Health	104	8	0	3	115

Table 1. Number of occurrences of most frequent codes by organization. Roles: light grey, Aspects: dark grey.

UNICEF (A)			WHO (B)		
Code	No. Occurrences	Percent (%)	Code	No. Occurrences	Percent (%)
Capacity-building	183	10	Capacity-building	52	23
Policy & advocacy	160	9	Policy & advocacy	35	15
WASH monitoring & surveillance	64	4	WASH monitoring & surveillance	32	14
Equity	125	7	Intersectoral collaboration	17	7
Education	114	6	Health facilities	13	6
Hygiene behavior	105	6	Climate change	10	4
Health	96	5			

WORLD BANK (C)			JMP (D)		
Code	No. Occurrences	Percent (%)	Code	No. Occurrences	Percent (%)
Financial support	14	5	WASH monitoring & surveillance	14	38
Renewable energy	28	10	Capacity-building	7	19
Food security	18	7	Wastewater reuse	2	5
Equity	12	4	Drinking water	1	3
Sanitation	12	4	Health facilities	1	3
Wastewater	12	4	Education	1	3

Table 2. Sub-tables A-D showing the most common relative code counts and associated percentages by organization. Roles: light grey, Aspects: dark grey

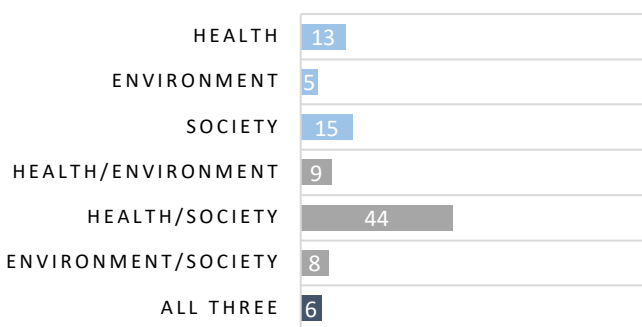
Capacity-building and *Policy & advocacy* were the most common roles identified in UNICEF and WHO, with *WASH monitoring & surveillance* closely following in frequency. The World Bank and JMP predictably describe their respective roles in WASH investment through *Financial support* and *WASH monitoring & surveillance*. The frequency in aspects of WASH, however, differ greatly between each organization. While UNICEF emphasizes *Equity*, *Education*, *Hygiene behavior* and *Health* as most common in their WASH agendas, the World Bank emphasizes *Renewable energy* and *Food security* more than *Equity* and even *Sanitation*. On the other hand, WHO prioritizes *Intersectoral collaboration*, *Health facilities* and *Climate change* in their WASH strategy. Similar to WHO and UNICEF, the JMP emphasizes

Health facilities and *Education* as priorities but also *Wastewater reuse* and *Drinking water*, which are not prioritized to the same percentage in other organizations.

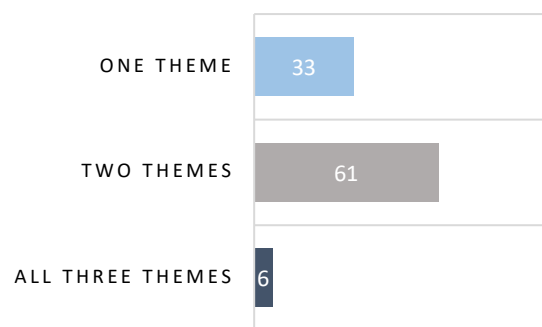
Thematic Analysis

For the thematic analysis, the singular themes of *Health*, *Environment* and *Society* can be seen in Plot 1 across all organizations. Of the seven possibilities, the theme that appeared the most frequently was the combined theme *Health/Society* with *Health* and *Society* individually following in percent occurrence. However, the combinations of these themes were also included since WASH strategies were often discussed as having multiple core motivations that overlapped. The occurrence of these themes segregated by singular and integrated themes is evident in Plot 2, where most of the content analyzed falls under integrated themes (two themes and all three) with just over 30% singularly themed.

PERCENT OCCURRENCE ALL ORGS



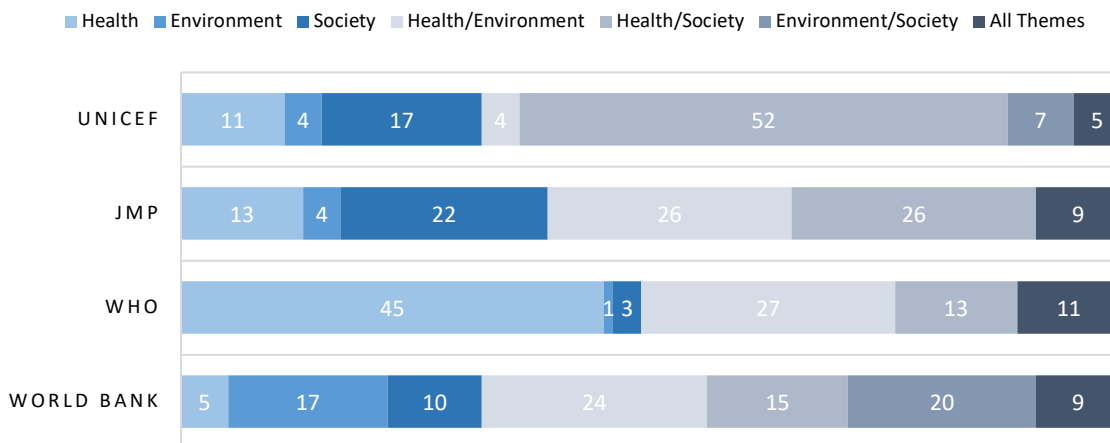
INTEGRATED VS. SINGULAR



Plot 1. Occurrence of seven possible themes or theme combinations across all organizations. Each bar indicates percent out of 100%.

Plot 2. One theme: includes *Health*, *Environment*, or *Society*; Two themes: includes *Health/Society*, *Health/Environment*, or *Environment/Society*. Each bar indicates percent out of 100%.

PERCENT OCCURRENCE BY ORGANIZATION



Plot 3. Singular themes (blue color scheme) and integrated themes (grey color scheme) segregated by organization. Subsections in each of the four bars indicates percent out of 100%.

Theme occurrence was also grouped by organization and separated based on the percent occurrence of singular versus integrated themes (Plot 3). Perhaps the most integrated organization is the World Bank, which shows more of a clear majority (close to 70%) as integrated. The least integrated are WHO and JMP. The percentage sum for singular themes in WHO and JMP are respectively 49%, and 39% while the percentage sum for combined themes is 51% and 61%. The most prevalent theme between all organizations is *Health/Society* while the least prevalent theme is *Environment*. Importantly, the percent integration of all three themes (the subsections on the far right) in each organization shows between 5-11%, which are small percentages relative to either the dual-themed or singular-themed categories.

To highlight the differences between singular and combined themes, Table 3 shows some example quotations extracted from documents.

THEME	SOURCE	QUOTE
Health	World Bank 1:182	<i>"While the emphasis of such systems is to reduce health risks associated with contaminated water and help reduce infant mortality."</i>
Environment	UNICEF 19:46	<i>"This should include supporting the adoption of innovative and environmentally sustainable technologies for desalination, water harvesting, wastewater treatment and wastewater reuse."</i>
Society	UNICEF 19:57	<i>"In particular, there is a need to improve facilities and services for menstrual hygiene management, which can reduce the risk of girls failing to attend or even dropping out of school."</i>
Health/Society	JMP 12:21	<i>"In future the JMP will also publish estimates of access to 'safely managed' drinking water and sanitation services at home and access to WASH in institutional settings including schools and healthcare facilities."</i>
Health/Environment	WHO 6:29	<i>"Where water is scarce, safe reuse of wastewater, particularly in agriculture, not only provides a buffer, thereby increasing resilience to climate change, but also contributes to food production and the nutritional status of local and urban communities. To make reuse a viable alternative, it needs to be safely managed so that it is protective of health and the environment."</i>
Environment/Society	World Bank 1:145	<i>"Water and sanitation programs that value scarce water resources while expanding and improving coverage for the underserved."</i>
All Three	WHO 6:151	<i>"The diversity in the ecology and biology of disease vectors...is important...in conservation areas of wetlands and other aquatic ecosystems, where local communities may depend on ecosystem products and services, but also be exposed to the risks of vector-borne disease transmission."</i>

Table 3. List of quotes from each theme with listed source (document #: quote #) and either full or abbreviated excerpts.

Quote 1:182 from the World Bank Infrastructure Strategy definitively links investment in WASH infrastructure with *Health*, which in this case is specifically prevention of infant mortality resulting from improper WASH services. Similarly, the quotes linking WASH with *Environment* (19:46) or *Society* (19:57) respectively contain phrases such as “environmentally sustainable” and “menstrual hygiene management” that state a clear purpose for types of infrastructure. The paired themes show overlap in each of these three, often highlighting multiple benefits of WASH infrastructure or investments. For example, in quote 6:29 from the WHO WASH Strategy which is categorized as *Health/Environment*, investment in wastewater reuse technology is encouraged not only to conserve scarce water resources, but also for boosting health benefits linked to food security in a changing climate. *Health/Society* and *Environment/Society* discuss overlaps with equity issues in WASH through key goals such as revealing access gaps in schools and healthcare facilities through WASH surveillance (12:21) and reaching underserved populations (1:145). The overlap of all three themes can be seen in quote 6:151 also from the WHO WASH Strategy that describes the need to recognize inequitable community exposure to diseases through local water resources.

DISCUSSION

The frequency of codes within each organization (Table 2) can be interpreted as the roles and aspects that each organization invests the most resources in. For example, UNICEF’s most frequent WASH code outside of organizational roles was *Equity*. From surface level analysis, it appears that UNICEF invests the most resources in WASH solutions that reduce inequities, particularly in the context of centering the needs of women and girls (i.e., eliminating vulnerabilities from open defecation, menstrual hygiene management, etc.). To achieve this, since the most coded role was *Capacity-building*, UNICEF’s primary role may be to increase the capacity of local governance, partnerships, and other in-country efforts that align with equity-oriented WASH goals. By the same logic, UNICEF’s secondary role would be to influence policy and advocate for equity-based WASH solutions. The WHO prioritizes the same roles but, according to the code counts, this is mostly in the context of promoting collaboration between sectors and improving the quality of WASH in healthcare facilities. While the JMP’s primary role is in *WASH monitoring & surveillance*, it shows overlap between the *Health facilities* and *Education* codes identified in WHO and UNICEF, which indicates that the JMP does incorporate the priorities of both organizations in their monitoring efforts. Interestingly, *Wastewater reuse* was identified with more frequency than the other three priorities, demonstrating a commitment to monitor alternative water treatment and conservation methods. For the World Bank, WASH in a *Renewable energy* and *Food security* context was most frequently coded and their primary role for achieving these strategies was through direct financial investment (*Financial support*). The frequency of *Equity* and more conventional WASH aspects like *Sanitation* and *Wastewater* were not seen as more worthy of investment than *Renewable energy* or *Food security*. This deviation from the strategies of UNICEF and WHO may be attributed to the World Bank not being as clearly defined as a health organization.

The occurrence of the themes described in Plots 1-3 can be interpreted as the value system that each organization uses to guide their investments in WASH infrastructure. Overall, the thematic analysis supports the direction and integrated nature of SDG 6 in the 2030 Agenda, which describes not only recognizing the human right to water, but also “that social development and economic prosperity depend on the sustainable management of freshwater resources and ecosystems.”^{15,16} However, this research shows that there is still room for more integrated WASH strategies by these organizations if SDG 6 is to be achieved. In particular, the relatively low percentage of the *Environment* theme across UNICEF, WHO and JMP shows that health organizations may be trying to integrate natural resource

management into their health policies but there is still a significant amount that sees WASH through primarily a human health and social/economic/political equity lens. Furthermore, the consistent low occurrence of text (5-11%) containing all three themes shows that the WASH strategies from health organizations could be recalibrated to better align with SDG 6 targets. Additionally, this lack of integration in WASH policies suggests that perhaps there is little clarity regarding the roles that health organizations play in WASH. The nuance behind roles in WASH is supported by some of the data from one interview held with a key informant from JMP. According to this expert, there is still ambiguity:

“...in many countries, there is, not disagreement, but there is not yet clarity on the roles and responsibilities of different sectoral agencies in terms of improving the situation. So is this something that's led by the health sector? Or is it something that's led by the water and sanitation sector?...”

They later expand on this idea in the interview by tying this ambiguity to health policies:

“...you know, you don't find that water and sanitation issues are always being reflected in the policies and programs which are being adopted by health sector agencies.”

Although this is just the experience of one key informant, these statements provide insight into the structure of current policies and potentially inspire future directions to better fulfill the 2030 Agenda. If this ambiguity in roles persists in leading health organizations' WASH strategies, it may act as another barrier to implementing the necessary infrastructure for vulnerable communities. Additionally, the fact that much of the policy analyzed in this study discusses equitable access and the human right to water is promising, but most of that discussion neglects to include the current state of water resources and how some of those resources, depending on the region or country, is not suitable to meet growing demand. There is also little emphasis on specific solutions such as wastewater reuse for agriculture or desalination technologies in water scarce environments throughout these strategies, which are important methods to include in WASH strategies that seek to increase equitable access. If these key components of access are not acknowledged, there may be consequences for local populations whose rights to healthy living may be compromised, which would result in the failure of meeting any part of SDG 6.¹⁰ The Sustainable Development Goals represent a global shift towards recognizing that social equity, economic prosperity, human health, and the quality of the natural environment are completely intertwined and can no longer be thought of as separate entities with separate problems.^{5,11,12,14} Therefore, in order to engage more fully with the SDGs, leaders in WASH efforts must produce strategies that are both more transparent and more representative of the evolving WASH needs and challenges of global populations.

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APPENDIX

- I. CONDENSED CODEBOOK
- II. COMPLETED CODEBOOK
- III. COMPLETED DOCUMENT LIST
- IV. IRB APPROVAL & CONSENT FORM
- V. INTERVIEW GUIDE & QUESTIONS
- VI. INTERVIEW TRANSCRIPTS

I. CONDENSED CODEBOOK

Original – 62 total codes

- I. Challenges to WASH infrastructure
 - a. **Cost of WASH infrastructure**
 - b. Socio-political conflict
 - c. Climate change
 - d. Natural disasters
 - e. Water resources
 - f. Urbanization
- II. Infrastructure Implementation
 - a. Rehabilitation of WASH facilities
 - b. Desalination
 - c. Latrines
 - d. Wastewater reuse
 - e. New infrastructure technology
 - f. Resilient WASH infrastructure
- III. Intersectoral Collaboration
 - a. Private investment in WASH
 - b. Public investment in WASH
 - c. Public-private partnerships
 - d. **Public-private-NGO partnerships**
 - e. Coordination between agencies
 - i. **JMP**
 - ii. **WHO**
 - iii. **World Bank**
 - iv. **UNICEF**
- IV. Investment in WASH infrastructure
 - a. Hygiene behavior
 - b. Community engagement
 - c. Drinking water
 - d. Health facility
 - e. Health
 - f. Humanitarian response
 - g. Sanitation
 - h. Wastewater
 - i. Rural Urban
 - j. Infrastructure co-benefits
 - i. Education
 - ii. Food security
 - iii. Equity
 - iv. Poverty reduction
 - v. Renewable energy
- V. Role of Organization
 - a. Capacity-building
 - b. **Child and adolescent welfare**
 - c. Financial support
 - d. Policy and advocacy
 - e. Water sector leader
 - f. WASH monitoring and surveillance
- VI. Inadequacy of current WASH systems
 - a. **Outdated WASH infrastructure**
 - b. **Demand for WASH infrastructure**
- VII. WASH strategy link to MDGs/SDGs
- VIII. **Change in strategy**

Revised (version used for analysis) – 44 total codes

- I. Challenges to WASH infrastructure
 - a. Socio-political conflict
 - b. Climate change
 - c. Natural disasters
 - d. Water resources
 - e. Urbanization
- II. Infrastructure Implementation
 - a. Rehabilitation of WASH facilities
 - b. Desalination
 - c. Latrines
 - d. Wastewater reuse
 - e. New infrastructure technology
 - f. Resilient WASH infrastructure
- III. Collaboration
 - a. Private investment in WASH
 - b. Public investment in WASH
 - c. Public-private partnerships
 - d. Coordination between agencies
 - e. Intersectoral collaboration
- IV. Investment in WASH infrastructure
 - a. Hygiene behavior
 - b. Community engagement
 - c. Drinking water
 - d. Health facility
 - e. Health
 - f. Humanitarian response
 - g. Sanitation
 - h. Wastewater
 - i. Rural Urban
 - j. Infrastructure co-benefits
 - i. Education
 - ii. Food security
 - iii. Equity
 - iv. Poverty reduction
 - v. Renewable energy
- V. Role of Organization
 - a. Capacity-building
 - b. Financial support
 - c. Policy and advocacy
 - d. Water sector leader
 - e. WASH monitoring and surveillance
- VI. Inadequacy of current WASH systems
- VII. WASH strategy link to MDGs/SDGs

II. COMPLETED CODEBOOK

PRIMARY CODES

Primary Code	Challenges to WASH infrastructure	Primary Code	WASH Infrastructure implementation
Detailed Description	Use to describe any type of past, present or future challenges to components of WASH infrastructure investments by health organizations that has/could influence strategy	Detailed Description	Reference to implementation (i.e. construction) of WASH infrastructure as a strategy of the organization
Inclusion Criteria	Include challenges tied to any environmental, social, political, and economic obstacles	Inclusion Criteria	Can include structures like boreholes, wells, latrines, wastewater treatment facilities, hydropower, etc.
Exclusion Criteria	Do not include any challenge that is not directly tied to the organization's strategy for WASH infrastructure; no generalist statements about issues like floods/droughts unless also in the same context as WASH investment	Exclusion Criteria	Avoid including references to infrastructure outside of WASH context (or general statements about infrastructure); avoid references to the state of infrastructure (this is not necessarily contributing to strategy)
Typical excerpt	"Another example in the WASH sector: the WASH BAT 2015 revealed that much of the current situation in the Bolivian WASH sector - especially the gap between rural and urban - is explained by lacking management capacities and weak sector coordination."	Typical examples	"The programme will construct subsurface dams, aquifer-recharge systems and structures for stormwater harvesting for use during the dry spell and solar pump technology will go to scale."
Atypical excerpt	"Poor or unequal access to WASH services is exacerbated by humanitarian crises affecting Cameroon, including i) the spill-over from the conflict in Central African Republic (CAR) and ii) the Boko Haram insurgency that have resulted in both an increased internal displacement..."	Atypical examples	"Strengthened supply chains will offer a range of affordable, durable and high-quality water, sanitation and hygiene products to households, such as toilet construction materials, soap and household water treatment products."
Close but no	"Many of those who lose their livelihoods as a result of natural disasters and climate change, as well as millions of others, migrate to new habitats - frequently in urban areas - that often lack safe drinking water, sanitation..."	Close but no	"The SEDP 2016-2020 focuses on macro-economic growth, decentralization, improving market institutions, and infrastructure development, in line with Vietnam's integration into global and regional market via Trans-Pacific Partnerships and ASEAN Economic Community."
Secondary codes	Climate change, Natural disasters, Socio-political Conflict, Urbanization, Water Resources	Secondary codes	Latrines, Wastewater reuse, Desalination, New infrastructure technology, Rehabilitation of WASH facilities, Resilient WASH infrastructure
Primary Code	Investment in WASH infrastructure	Primary Code	Collaboration
Detailed Description	Use to describe any type of past, present or future strategy stated by the organization to invest in WASH infrastructure. Can be linked to multiple sectors.	Detailed Description	Describes the method that investment in WASH is made possible by - is it through public or private investment? Is it a coordinated effort between sectors, etc.?
Inclusion Criteria	Any text tying a proactive strategy to WASH infrastructure language (e.g. piped water, WASH programs/policy, etc.)	Inclusion Criteria	Include quotations explicitly describing WASH investment through local government, private industry, public-private partnerships, or agency coordination. Also include text that describes WASH investment as a result a multi-sectoral effort such as through education, finance, environment, etc.
Exclusion Criteria	Any text not explicitly stating a strategy to invest in WASH infrastructure	Exclusion Criteria	Do not include text that describes general WASH investment that a specific organization is proposing. Only if it also touches on how it will approach it from a collaborative system.
Typical examples	"Explore partnerships with local entrepreneurs and other private sector enterprises to strengthen supply chains for commodities such as household water filters, hand-washing facilities, latrine construction products, supplementary feeds for infants and children."	Typical examples	"WASH resilience programming will be sought in collaboration with partners under the Pacific Regional Infrastructure Facility (PRIF) which functions to coordinate bilateral support to Pacific island countries between Australia, New Zealand, Japan, the European Union as well as the Asian Development Bank..."
Atypical examples	"For example, in the water sector, Sanitation, Hygiene and Wastewater Support Service (SWAT) teams will be mobilized to work with Bank teams to identify opportunities to address poverty in water supply and sanitation projects, as appropriate."	Atypical examples	"According to JMP 2015 figures 67% of the population in the Pacific have access to improved drinking water sources in total and only 55% of the rural population"
Close but no	"The output will facilitate cross-sectoral interventions for primary schools including WASH, nutrition, health, child protections and quality learning environment."	Close to but no	"Self-reported data collected on WASH in Schools from Ministries of Education in the region demonstrate that school children in Kiribati, Marshall Islands, and Solomon Islands are at greater disadvantage in the Pacific..."
Secondary codes	Hygiene behavior, Drinking water, Health facility, Health, Sanitation, Wastewater	Secondary codes	Coordination between agencies, Private investment in WASH, Public investment in WASH, Intersectoral collaboration, Public-Private Partnerships
Primary Code	Role of organization	Primary Code	WASH strategy link to MDGs/SDGs
Detailed Description	Used to describe specific roles and responsibilities of specific organizations as they relate to different aspects of WASH work	Detailed Description	Describes how the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) informs WASH strategies; more focused on the evolution/transition from MDGs to SDGs
Inclusion Criteria	Any text within strategy documents and/or interviews that describe roles, responsibilities, or obligations that the organization has related to WASH and health work (ideally together). Essentially, how they see themselves in the WASH world. Include text that describes organizational roles as they relate to other organizations.	Inclusion Criteria	Include text describing WASH strategy in each organization as determined by the MDGs/SDGs; specifically SDG 6 or subparts (language should be pretty clear - should explicitly mention MDGs/SDGs)
Exclusion Criteria	Do not include text that describes organizational roles unrelated to WASH or health	Exclusion Criteria	Exclude text not explicitly mentioning MDGs/SDGs (or specific numbers) as part of the org's WASH strategy
Typical examples	No examples, codes always defined by secondary codes	Typical examples	"UNICEF's WASH programme will support the national priorities set out in the Governments Five Year Plan, which are in line with the Sustainable Development Goals (SDG), including SDG 6: Ensure availability and sustainable management of water and sanitation for all."
Atypical examples		Atypical examples	"UNICEF has supported the GoM to develop a cost investment plan for rural WASH between 2015-2030, which highlights chronic underinvestment in the rural WASH sector and need for massive long term investment if SDG targets are to be reached."
Secondary codes	Capacity-building, Child and adolescent welfare, Financial support, Policy and advocacy, Water sector leader, WASH monitoring and surveillance	Close to but no	"The WASH programme will in turn complement the priority objectives as articulated in the final report of UN Strategic Assessment process."
Primary Code	Inadequacy of current WASH systems		
Detailed Description	Describes the poor condition of current WASH systems in terms of supply/demand, facility conditions, incidence of disease, etc. that are inadequately meeting the needs of the relevant population(s)		
Inclusion Criteria	Include text about poor conditions associated with WASH infrastructure that are a determinant of the organization's WASH strategy; key words: inadequate water supply, water scarcity, lack of WASH facilities, lack of access		
Exclusion Criteria	Do not include text that describes general global conditions of poor WASH infrastructure and associated consequences; must align with organization's strategy		
Typical examples	"The WASH programme will also prioritize interventions aimed at addressing the causes of lack of adequate access to gender sensitive WASH services in schools."		
Atypical examples	"Both the public and the private sector suffer from a lack of skilled workers with the result that water supply systems are badly constructed and maintained."		
Close to but no	"There is a clear pattern of relation of high incidences of diarrhoea, acute respiratory infections (ARIs) and stunting with the prevalence of open defecation, use of unsanitary latrines, and unsafe drinking water consumption."		

SECONDARY CODES

Primary root: Challenges to WASH infrastructure

Secondary Code	Socio-political conflict
Detailed Description	Description of political unrest or conflict influencing WASH infrastructure investments or strategies developed by the organization
Inclusion Criteria	Any text referring to geo-political instability, government instability, lack of political cooperation, etc. interfering with WASH infrastructure investment/development
Exclusion Criteria	Any text not referring to political conflict interfering with WASH infrastructure development/investment
Typical examples	"Less than 2 percent of Afghanistan and Nepal's economically feasible hydropower potential of over 50 GW is actually used do to lack of regional cooperation."
Atypical examples	"This strategy is informed by the initiatives of the UN Joint Programme on Local Governance and Decentralized Service Delivery (JPLG) that aims to strengthen local governance and enhance decentralized services in all regions of Somalia. It helps address the fundamental challenges of limited institutional capacity and resource with unclear roles and responsibilities and an urgent need to increase the capacity of local government to deliver public services."
Close to but no	"Droughts and ongoing fighting have brought Somalia close to another famine, just four years after food shortages killed 260,000 people."
Secondary Code	Climate change
Detailed Description	Describes any aspect of the impact of climate change on WASH infrastructure or infrastructure development
Inclusion Criteria	Include text linking climate change explicitly to determinants in the organization's WASH strategy; often used in the same context as climate resilient infrastructure (must be WASH related) or natural disasters
Exclusion Criteria	Do not include text about climate change impacts in general (i.e. increase in natural disasters), without it being a reason to invest in improved WASH infrastructure
Typical examples	"Additionally, investments will be made in climate-resilient and cost-effective water, sanitation and hygiene (WASH) infrastructure and hygiene protocols in health facilities."
Atypical examples	"UNICEF will advocate for policies and measures to ensure resilience of resources and infrastructure to climate and non-climate disasters, such as floods, cyclones and earthquakes, to ensure minimum disruption to education, nutrition/health, and safe water availability and services."
Close to but no	"Adaptation to climate change is feeding demand for infrastructure that is more resilient to natural disasters."
Secondary Code	Natural disasters
Detailed Description	Describes the influence of natural disasters (commonly linked to climate change) on WASH infrastructure development; can include storms, droughts, tsunamis, etc.
Inclusion Criteria	Include text about how lessening the severity and impact of natural disasters through WASH infrastructure is a part of the organization's strategy ; a key word may be "disaster resilience"
Exclusion Criteria	Do not include text stating the severity of natural disasters without linking to impact on WASH infrastructure and the organization's aspirations to improve WASH infrastructure
Typical examples	"The organization will advocate for the scale-up of innovative models for the realization of children's right to safe and disaster-resilient water and basic sanitation, including by working more with the private sector."
Atypical examples	"The compounding factor to the collapse of WASH infrastructure and government oversight is the harsh climatic conditions and frequent droughts. Local water shortage is common as climate change makes rainfall less predictable."
Close to but no	"Natural disasters are common (e.g. droughts in Niger, cyclones in Madagascar and floods in Mozambique) and increasingly widespread."
Secondary Code	Water Resources
Detailed Description	Describes issues with water resources - can be linked to water quality, access to water, water scarcity, etc. that affect human consumption of water
Inclusion Criteria	Include text that explicitly describes investing in aspects of water resources and associated infrastructure as a part of the organization's WASH strategy (has to do with increasing WASH access)
Exclusion Criteria	Do not include text describing the state of source water without a link to the organization's WASH strategy (avoid generalist statements)
Typical examples	"UNICEF will also strengthen its engagement with emerging issues, including climate change, building on the successful piloting of the managed aquifer recharge."
Atypical examples	"Communities will be mobilized on raising community awareness on water conservation specifically spring protection in the mountainous areas and encourage HH to tap rain water from the roofs and use for domestic purposes as well as excess water to allow to trickle down to the ground. This will enhance to reduce the surface runoff and recharge the groundwater."
Close to but no	"The migration from rural to urban areas led to a rapid urbanization process that has resulted in unplanned settlements with poor infrastructure, land degradation and pollution, increased pressure on freshwater supplies..."
Secondary Code	Urbanization
Detailed Description	Describes the impact of urbanization and/or population growth on WASH infrastructure in a supply/demand context and subsequent impact on human water consumption and health; often used in the context of expansion of informal settlements
Inclusion Criteria	Include text about how urbanization is influencing the organization's WASH infrastructure development or investment strategy; key words: population growth, expanding periurban/informal settlements
Exclusion Criteria	Exclude text about general urbanization or population growth statements without emphasis on impact on WASH infrastructure or specific link to organization's WASH strategy
Typical examples	"Mongolia is experiencing continued rapid urbanization with over 68 percent of the population residing in urban or peri-urban areas, resulting in unplanned settlements, increased land degradation, increasing air, water and soil pollution and major challenges for energy distribution and waste management."
Atypical examples	"As extended family members from outer islands move in the health and social problems associated with poor water, sanitation and hygiene service provision are being compounded."
Close to but no	"Infrastructure is at the intersection of most regional and global issues in today's world, such as rapid urbanization, climate change, natural disasters and food security."

SECONDARY CODES

Primary root: WASH infrastructure implementation	
Secondary Code	Rehabilitation of WASH facilities
Detailed Description	Describes efforts to rehabilitate or rebuild already existing WASH infrastructure that do not function adequately or have been decommissioned
Inclusion Criteria	Include text that describes rehabilitation (or similar language) of WASH infrastructure in schools, communities, urban/rural settings, healthcare facilities, etc. as part of the organization's WASH strategy
Exclusion Criteria	Exclude text about WASH infrastructure that is not directly related to rehabilitation (i.e. avoid general statements about degraded or damaged WASH infrastructure) and has no relevance to the organization's WASH strategy
Typical examples	"...the programme will support the construction or rehabilitation of water points (mainly boreholes equipped with manual/solar pumping systems, small scale water networks)..."
Atypical examples	"Water supply and sanitation: Programs focus on rehabilitation and expansion of existing infrastructure, optimization of systems, demand management and operation efficiency, and compliance with EU standards and wastewater treatment facilities."
Close to but no	"Both the public and private sector suffer from a lack of skilled workers with the result that water supply systems are badly constructed and maintained."
Secondary Code	Desalination
Detailed Description	Describes investment in desalination, a technical term for water treatment in primarily coastal communities that converts saltwater to potable freshwater
Inclusion Criteria	Include text explicitly stating desalination as a part of the organization's WASH strategy, especially as it pertains to human consumption and health
Exclusion Criteria	Do not include text that does not specifically describe desalination (will usually not be used out of the context of the organization's WASH strategy)
Typical examples	"Projects such as the EU-funded UNICEF constructed seawater desalination plant in Gaza and the UNICEF-MIT photovoltaic electro-dialysis reversal brackish water desalination prototype provide opportunities for learning and scale-up, lessons on how to minimize the negative environmental impacts of desalination and how to maximize energy efficiency and the use of renewable energies."
Atypical examples	"Chronic power shortages compound the situation, impeding efforts to build and sustain infrastructure for desalination and wastewater treatment, and restricting availability of piped water to households..."
Close to but no	"Explore desalination for horticulture in Morocco"
Secondary Code	Latrines
Detailed Description	Describes investment in latrines
Inclusion Criteria	Include text that describes any investment by the organization in the rehabilitation, new construction or innovation of latrines as part of the overall WASH strategy. Bonus points for text that ties latrine construction to health outcomes.
Exclusion Criteria	Do not include text that doesn't explicitly mention latrines. Maybe some text will mention wastewater management - this is not necessarily about latrines. Do not include.
Typical examples	"Innovative EZ latrine to meet demand in peri-urban areas"
Atypical examples	"Community leaders and volunteers will be mobilized and trained in focus provinces to increase demand for handwashing, improved latrines and water filtration systems."
Close to but no	"Proportion of the population having an improved sanitation facility"
Secondary Code	Wastewater reuse
Detailed Description	Use to describe any mention of wastewater reuse technology in organization's strategy
Inclusion Criteria	Has to mention wastewater reuse technology/systems specifically as a component of strategy
Exclusion Criteria	Do not include text that describes wastewater management in general, or any text describing wastewater reuse outside of contributions to the organization's strategy
Typical examples	"Modernized water and irrigation schemes: develop wastewater reuse program in Tunisia; develop innovative finance schemes (e.g., PPPs) in irrigation."
Atypical examples	"Strengthening the resilience of water supply and sanitation systems requires systematic risk assessment of short- and long-term impacts of climate change in risk assessments. Where water is scarce, safe reuse of wastewater, particularly in agriculture, not only provides a buffer, thereby increasing resilience to climate change, but also contributes to food production and the nutritional status of urban communities."
Close to but no	"In urban areas, UNICEF will advocate and stress the need to manage faecal waste, solid waste and drainage..."
Secondary Code	New infrastructure technology
Detailed Description	Describes the use or introduction of any new technology associated with WASH infrastructure
Inclusion Criteria	Include text about technology that is new to the region/country associated with the organization's WASH strategy; key words may be more technical in nature: desalination, technological innovations, etc.; may also be in the context of climate resilient infrastructure and/or renewable energy
Exclusion Criteria	Do not include text about innovative technology outside the context of WASH or the organization's WASH strategy
Typical examples	"UNICEF will promote and support the multi-faceted sustainability agenda by promoting innovative approaches including decentralized management of water infrastructures, sub-surface dams, solar powered water supply systems and storm water harvesting."
Atypical examples	"Projects such as the EU-funded UNICEF constructed seawater desalination plant in Gaza and the UNICEF-MIT photovoltaic electro-dialysis reversal brackish water desalination prototype provide opportunities for learning and scale-up, including lessons on how to minimize the negative environmental impacts of desalination and how to maximize energy efficiency and use renewable energies."
Close to but no	"Technological advances are offering new opportunities to leap-frog, while supporting a demand for more sophisticated infrastructure solutions..."
Secondary Code	Resilient WASH infrastructure
Detailed Description	Describes the concept of WASH infrastructure that is resilient against future impacts from climate change (i.e. natural disasters), urbanization, growing migrant populations, expanding informal settlements in urban areas, etc.
Inclusion Criteria	Include text about improving/increasing/implementing resilient WASH infrastructure as a part of the organization's overall WASH strategy, especially as it relates to health
Exclusion Criteria	Do not include text about resilient WASH infrastructure if it is unrelated to the organization's strategy; no generalist statements about "climate resilience" if not linked to the organization's strategy
Typical examples	"Climate-resilience water supply and sanitation is a key pillar of both the WASH and climate change strategies."
Atypical examples	"The programme will contribute to practical actions to manage risks from drought impacts, protect communities and strengthen the resilience of the economy."
Close to but no	"This output complements the objectives of Output 4.1 by contributing towards increased resilience among the most vulnerable children through interventions specifically targeting climate change adaptation and disaster risk reduction, and the development of a comprehensive monitoring system to support macro level policies, specifically related to WASH and nutrition."

SECONDARY CODES

Primary root: Investment in WASH infrastructure

Secondary Code	Hygiene behavior link to WASH infrastructure	Secondary Code	Sanitation link to WASH infrastructure
Detailed Description	Language identifying hygiene behavior issues as a component of the organization's WASH strategies	Detailed Description	Describes any aspect of the connection of sanitation or sanitation facilities to WASH infrastructure
Inclusion Criteria	Look out for hygiene behavior key words such as "open defecation", "hygiene practices", "handwashing", etc.	Inclusion Criteria	Include text about investment in sanitation infrastructure or programs as a part of the WASH strategy
Exclusion Criteria	Do not include references to WASH infrastructure without link to hygiene	Exclusion Criteria	Exclude text that is not about sanitation infrastructure or programs; exclude text that does not specifically link sanitation to the organization's WASH strategy
Typical examples	"Communities in target rural and peri-urban areas, small towns, schools and health centers, achieve open defecation free (ODF) status, with increased access to sanitation services, improved hygiene practices..."	Typical examples	"Increase investment of safely managed drinking water and sanitation, including a particular focus on energy efficient technologies."
Atypical examples	"Communities in target rural and peri-urban areas, small towns, schools and health centers, have access to sustainable water services and scalable service delivery models."	Atypical examples	"...but we do a lot of mobilization of communities in terms of community approach to total sanitation. So UNICEF isn't constructing the latrines, but the community is building the latrines in terms of ownership."
Close to but no	"And if the entire community end open defecation and are washing hands with soap at critical times then there will be a reduction in prevalence of diarrhea among children under five years and the number of people accessing safe means of excreta disposal will increase."	Close to but no	"A significant issue remains with only 18 percent of child faeces being disposed of in a sanitary manner."
Secondary Code	Community engagement in WASH	Secondary Code	Wastewater link to WASH infrastructure
Detailed Description	The concept of engaging local communities in the development of WASH infrastructure	Detailed Description	Describes any aspect of the connection of wastewater or wastewater treatment to WASH infrastructure
Inclusion Criteria	Include text describing actively trying to engage the local community or community leaders in WASH development as part of the overall organization strategy (i.e., engaging local religious leaders, including women)	Inclusion Criteria	Include text about the treatment of wastewater or the need for integration of (or improvement of) wastewater management into the organization's WASH strategy
Exclusion Criteria	Do not include text that describes blanket statements about community engagement in WASH; must be referencing community engagement as a component of organization's WASH strategy	Exclusion Criteria	Exclude text that is not about wastewater management or treatment; exclude text that does not specifically link wastewater treatment, management or improvement to the org's WASH strategy
Typical examples	"Developing procedures for community participation and establishment of collaborative strategies between service providers and water user's associations are taking center stage in decentralized management of water supply delivery mechanisms."	Typical examples	"In urban settings, UNICEF will advocate and stress the need to manage faecal waste, solid waste and drainage, reducing threats to children using strategies appropriate to challenges of the urban environment."
Atypical examples	"Key influencers such as local leaders and trusted community members in particular will be mobilized and engaged to promote services and emphasize the benefits of desired behaviors in relation to immunization, improved sanitation, safe drinking water and appropriate hygiene."	Atypical examples	"This includes field-testing of an innovative construction designs for indoor water supply and sanitation facilities in schools, dormitories and ECD centres using mobile containers with underground connection pipes and septic tanks"
Close to but no	"On the other hand, children can be considered as change agents who can bring the sanitation and hygiene practices that they learn from schools to their parents and communities."	Close to but no	"Only 61 percent of the population use an improved toilet facility and 59 percent have a specific place for handwashing equipped with soap and water."
Secondary Code	Drinking water link to WASH infrastructure	Secondary Code	Rural WASH infrastructure
Detailed Description	Describes any aspect of the connection of drinking water supply, quantity or quality to WASH infrastructure	Detailed Description	Describes investment in WASH infrastructure in a rural setting
Inclusion Criteria	Include any text about drinking water supply or quality connected to WASH infrastructure quality and/or development, especially as it pertains to health; must be related to organization's WASH strategy	Inclusion Criteria	Include text about any aspect of investing in rural WASH infrastructure by the organization as part of their overall strategy (can include rural schools, healthcare facilities, etc.)
Exclusion Criteria	Do not include statements about drinking water supply or quality unrelated to the organization's WASH infrastructure; no blanket statements about global deficits in drinking water quantity or quality	Exclusion Criteria	Do not include general statements about the state of rural WASH infrastructure without explicit connection to the organization's strategy
Typical examples	"Number of people in programme area using safe (free from bacteriological and arsenic contamination) drinking water from improved water sources as a result of UNICEF direct support."	Typical examples	"UNICEF has supported the GoM to develop a costed investment plan for rural WASH between 2015-2030, which highlights chronic underinvestment in the rural WASH sector and the need for massive long term investment if the SDG is to be reached."
Atypical examples	"Getting enough quality of drinking water remains a challenge for many households in rural areas. To address this, the programme will organize workshops on household water conservation and treatment in addition to supplying vulnerable groups with appropriate kits."	Atypical examples	"...provide technical assistance to scale-up integrated rural sanitation models in two municipalities, applying a gender and intercultural approach, and promote good health practices and MHM"
Close to but no	"Over 1.3 million people (approximately 300,000 children) are estimated to have limited access to safe drinking water."	Close to but no	"It is presumed that sanitation and hygiene promotion will be a government priority area and more resources will be allocated to rural WASH."
Secondary Code	Health facility link to WASH infrastructure	Secondary Code	Urban WASH infrastructure
Detailed Description	Describes WASH infrastructure related to health facilities and health facility infrastructure	Detailed Description	Describes the investment in WASH infrastructure in an urban setting
Inclusion Criteria	Include text about addressing WASH infrastructure in health facilities as a part of the greater WASH strategy of the organization; sometimes used in the same context as schools and/or communities	Inclusion Criteria	Include text about any aspect of investing in urban WASH infrastructure by the organization as part of their overall strategy (can include schools, healthcare facilities, informal settlements, etc.)
Exclusion Criteria	Do not include text that describes conditions of WASH infrastructure in health facilities without a clear link to the organization's WASH strategy	Exclusion Criteria	Do not include general statements about the state of urban WASH infrastructure without explicit connection to the organization's strategy
Typical examples	"Additionally, investments will be made in climate-resilient and cost-effective water, sanitation and hygiene (WASH) infrastructure and hygiene protocols in health facilities."	Typical examples	"The mandate of reaching children in socially excluded communities means that the WASH programme will be designed to increase its involvement in urban WASH both in times of stability and crisis. Recognizing the differences between urban and rural service delivery in context, actors, technology and financing, the WASH programme will engage in urban WASH with the poorest and most vulnerable children in urban slums."
Atypical examples	"Engage with partners and positively influence partnerships to ensure health issues are considered and addressed by the WASH sector and to also ensure that WASH issues, notably in health care facilities, are addressed by the health sector as prerequisites to providing quality care."	Atypical examples	"The programme will build new relationships and collaboration frameworks with others that have comparative advantages, expertise and programs in urban WASH, as well as with municipal government actors, service provider and the private sector."
Close to but no	"Access to safe water and sanitation is also fundamental to enable health centres to provide quality care."	Close to but no	"Environmental vulnerability is a continued concern including, pollution of water bodies, degradation of watersheds, competition between irrigation and urban water services."
Secondary Code	Health link to WASH infrastructure	Secondary Code	Infrastructure co-benefits
Detailed Description	Describes WASH infrastructure connected to any aspect of health (general well-being either physical or mental)	Detailed Description	Use to describe text that mentions co-benefits of WASH infrastructure as a driver for the organization's strategy
Inclusion Criteria	Include text that describes WASH infrastructure as closely tied to health outcomes as a part of the greater WASH strategy of the organization; key words: diarrhoeal diseases, child stunting, health & nutrition, etc.	Inclusion Criteria	Include all text about investment in WASH infrastructure as a co-benefit to either, human health, renewable energy, food security, etc.
Exclusion Criteria	Do not include text that describes general health conditions of vulnerable populations without explicit links to WASH infrastructure or WASH strategy	Exclusion Criteria	Do not include text describing investment in WASH infrastructure without mentioning co-benefits to health, renewable energy, food security, etc. or do not explicitly mentioned water infrastructure
Typical examples	"By 2021, the most disadvantaged children in Mongolia benefit from increased access and utilization of services that promote health and nutrition, including water, sanitation, hygiene and interventions that mitigate the impact of air pollution..."	Typical examples	"In Central Asia the World Bank is engaged in a regional energy-water development program to build water and energy security through enhanced regional cooperation energy supply efficiency improvement."
Atypical examples	"The principle of the programme is to support the operationalization of governments' commitments to increase the resilience of all children and their families against water and sanitation related diseases at homes, in school and in healthcare facilities in ordinary times and during emergencies."	Atypical examples	"...multipurpose hydraulic infrastructure which can support irrigated agriculture and thus agricultural productivity and food security goals..."
Close to but no	"Drinking from unprotected or contaminated water sources predispose children to high incidence of diarrhoea which is the second leading cause of death among children under five globally."	Close to but no	"...the strategy update posits that this can be achieved in part through projects that seek to optimize co-benefits across infrastructure sectors, between infrastructure and environment (green), between infrastructure and social development (inclusive) and spatial benefits (regional)..."
Secondary Code	Humanitarian response link to WASH infrastructure	Tertiary codes	Education, food security, equity, poverty reduction, renewable energy
Detailed Description	Describes investment in WASH infrastructure within the context of humanitarian efforts (i.e. disaster relief, refugee camps)		
Inclusion Criteria	Include text that mentions WASH infrastructure investment (construction, distribution of products, small and large efforts) that is specifically tied to humanitarian responses. These can include disaster relief, refugee camps, mass migration, urban and rural settings, etc.		
Exclusion Criteria	Do not include text about WASH infrastructure investment outside the context of what is classified as humanitarian efforts (i.e. institutions such as schools, healthcare facilities, prisons, etc.)		
Typical examples	"Against a backdrop of the cluster lead agency for WASH, the chronic humanitarian situation in Somalia including the recurring drought/famine conditions, WASH related disease outbreaks and increasingly diverse and complex partnerships, the WASH programme will continue to to perform as a convenor in disaster risk reduction and building resilience."		
Atypical examples	"UNICEF has sponsored governments to be trained in e-course and in-person training on WASH in Emergencies, WASH in Schools including topics on gender and disability, Enabling Environment and Bottleneck Analysis."		
Close to but no	"Access and regularity of supply are a particular problem in Area C of the West Bank, a result of heavy restriction on movement of labor and goods, a virtual halt on permits for infrastructure development and ongoing destruction of WASH facilities by the Israeli security forces."		

SECONDARY CODES

<i>Primary root: Collaboration</i>		<i>Primary root: Role of organization</i>	
Secondary Code	Private investment in WASH infrastructure	Secondary Code	Role: capacity-building
Detailed Description	Describes investment in WASH infrastructure by private industry involved with as specific organization (UNICEF, WHO, World Bank, JMP)	Detailed Description	Use to describe text that pertains to increasing capacity in existing/future partnerships or government relating to WASH infrastructure strategy; definition of capacity building: community capacity building is a conceptual approach toward social and behavioral change and leads to infrastructure development (https://en.wikipedia.org/wiki/Capacity_building)
Inclusion Criteria	Include text that describes efforts to engage private industry in WASH development as part of the organization's WASH strategy	Inclusion Criteria	Look out for words like "increasing capacity", "scale-up", "expansion of services" in relation to WASH strategy
Exclusion Criteria	Do not include text that describes private investment in WASH infrastructure that is unrelated to any overall strategy established by the organization	Exclusion Criteria	Avoid language that alludes to community engagement, policy, etc. unless it is in the context of increasing capacity of current WASH infrastructure system
Typical examples	"UNICEF will encourage a greater role for the private sector in achieving sustainable and quality services, including community entrepreneurs, and other local private sector actors."	Typical examples	"Strategic focus in the Country Programme 2017-2020 will be on capacity development of national, sub-national and local governmental institutions to create an enabling environment for coverage and scale up of water and sanitation interventions."
Atypical examples	"The Bank is working on a new financing framework to increase the participation of the banking sector in financing local infrastructure investments in water, sanitation and urban services for Vietnam."	Atypical examples	"Equally important will be leveraging of funding from national sources and donors due to the big gap in the funding needs to meet the targets proposed in the Government's strategic Five Year Plan (PQG)."
Close to but no	"The IFC Global Infrastructure Fund will seek to ramp up private sector financing for investment projects..."	Close to but no	"...evaluating the region's performance and regulatory capacity in power, water and transport"
Secondary Code	Public investment in WASH infrastructure	Secondary Code	Role: financial support
Detailed Description	Describes investment in WASH infrastructure by country or local level government and involvement with specific organization (UNICEF, WHO, World Bank, JMP)	Detailed Description	Use to describe text that speaks to WASH infrastructure investment through financial support
Inclusion Criteria	Include text that describes efforts to engage country or local level government in WASH development as part of the organization's WASH strategy	Inclusion Criteria	Include all text detailing either indirect or direct financial support by the organization to any and all WASH infrastructure projects
Exclusion Criteria	Do not include text that describes government involvement in WASH infrastructure that is unrelated to any overall strategy established by the organization	Exclusion Criteria	Avoid including text about other WASH infrastructure investment strategies (i.e. policy and advocacy, capacity building) unless it is tied with finance
Typical examples	"Water, sanitation and hygiene (WASH) is a priority area under the Social and Human Capital Development pillar of the Government Five Year Plan (PQG 2015-2019). By 2019 the country intends to increase drinking water coverage to 75% (rural) and 90% (urban)."	Typical examples	"In partnership with AusAID, the bank will develop analytic work that will prioritize public financing for infrastructure particularly in the water and sanitation..."
Atypical examples	"In a bid to strengthen the enabling environment, the WASH programme will continue working closely with the key WASH ministries at all levels including Ministries of Health, Ministries of Education, Ministries of Water and Natural Resources, Ministries of Interior..."	Atypical examples	"Modernized water and irrigation schemes: develop wastewater reuse program in Tunisia; develop innovative finance schemes (e.g., PPPs) in irrigation."
Close to but no	"Government institutions are undergoing rapid change as increasing proportions of the national budget is allocated to social services and infrastructure provision after decades of neglect."	Close to but no	"Current funding allocations for the sector are grossly insufficient to reach the government defined sector goals."
Secondary Code	Public-private partnerships	Secondary Code	Role: policy and advocacy
Detailed Description	Describes the organization's involvement in partnerships between local government and the private sector	Detailed Description	Describes the organizational role around WASH and WASH infrastructure as influencing policy and as an advocate for WASH needs/services.
Inclusion Criteria	Include text that describes efforts to promote public-private partnerships specifically in WASH as a component of the organization's WASH strategy; key words: PPPs, PPP model, or any combination of public institutions and private enterprise	Inclusion Criteria	Include text that describes any investment in WASH or WASH infrastructure from a policy and advocacy standpoint as a part of the organizations overall WASH strategy (i.e. influencing policy generation by interacting with local government, developing guidelines for dissemination, etc.); key words may be "promotion", "advocate"
Exclusion Criteria	Do not include text that describes PPP models without linking explicitly to the WASH strategy of the organization	Exclusion Criteria	Do not use to describe text that does not contribute to overall WASH strategies (i.e. do not use for generalist statements about how an organization is "strong in policy and advocacy work")
Typical examples	"...advocating for public-private partnerships to find solutions to support the right to sustainable WASH services for vulnerable populations."	Typical examples	"Number of WASH policies and strategies developed, endorsed and disseminated."
Atypical examples	"UNICEF will work closely with new and existing partners, including international finance institutions, government ministries and the private sector"	Atypical examples	"The WASH sector leadership and coordination role presents a meaningful convening power in Somalia, evidenced by progress made on coordination within education, nutrition and WASH clusters. Therefore, the WASH Programme is in a position to influence policies and strategies for better results for children."
Close to but no	"...in the WASH sector special emphasis will be given to strengthening and scaling up of national and sub-national Government systems and integration of market-based approaches for moving households up the sanitation ladder."	Close to but no	"It is expected that the demand for UNICEF to play a leadership role in these results areas will continue to increase. Geo-politics and the war on terror have focused on government and international investment on security and military capacity. Considerable peace dividends can be gained from strategically planned WASH development."
Secondary Code	Coordination between agencies	Secondary Code	Role: water sector leader
Detailed Description	Describes general coordination or collaboration between organizations. Will usually be for organizations included in study but other organizations can be included as well.	Detailed Description	Used to define organization as a leader in the water sector. This could refer to a technical leader or primary roles in education, policy, monitoring, etc.
Inclusion Criteria	Include text that touches on general statements about agency collaboration efforts as part of WASH strategy. Agencies that should definitely be included are WHO, UNICEF, JMP, World Bank (these will have tertiary codes assigned to them). Auxiliary agencies are also welcome to be included but will be assigned only this bucket code.	Inclusion Criteria	Use to refer to text that describes the organization as being a leader that dictates the direction of actions and policy about WASH (i.e., influences regional government decisions, primary advisor of governments and partners, etc.); must be within context of overall WASH strategy
Exclusion Criteria	Do not include text that does not describe inter-agency collaboration as a part of a greater WASH strategy.	Exclusion Criteria	Do not use to refer to text that does not identify organization as primary advisor or leader. Not applicable to generalist statements about the organization as a "water sector leader" without linking to concrete leadership roles in WASH strategy
Typical examples	"There is now a discussion about establishing a global initiative to scale up hand hygiene, which would bring together not only WHO and UNICEF but other stakeholders, private sector, civil society, to have a big push on improving hygiene, generally."	Typical examples	"WHO's expertise in developing international standards and normative information that build on experience responding to WASH-related emergencies, authoritative technical guidance on water quality management, sanitation and wastewater, and WASH policies makes them ideally placed to provide technical support in emergencies."
Atypical examples	"But we are just one small part of the ecosystem of agencies working on the SDGs. So there is another group which has been established recently to coordinate global monitoring activities under SDG 6. So this goes beyond WASH and includes things like water for ecosystems, water management of wastewater..."	Atypical examples	"Moreover, as sector leader in water supply and sanitation in Bangladesh, UNICEF will advocate for innovative and scalable models for the realization of children's rights to improved WASH services at both national and sub-national levels."
Close but no	"Developing procedures for community participation and establishment of collaborative strategies between service providers and water user's association are taking center stage in decentralized management of water supply delivery mechanisms."	Close but no	"Under the leadership of the Ministry of Environment and Water (MoEW) and in collaboration with the MoH and the MoE, UNICEF will: (i) contribute to the IECOD model through technical assistance to department and municipal governments to reduce open defecation in rural areas..."
Primary Code	Intersectoral Collaboration	Secondary Code	Role: WASH monitoring and surveillance
Detailed Description	Collaboration and/or partnerships between multiple sectors - these could mean water sector, education sector, finance sector, etc.	Detailed Description	Refers to the organization's approach to WASH infrastructure investment through WASH monitoring and surveillance (data collection and analysis)
Inclusion Criteria	Include all text that describes intersectoral collaboration as a strategy to achieve better WASH infrastructure	Inclusion Criteria	Any key words/phrases (monitoring, surveillance, collecting data on indicators, baseline data) associated with investment or implementation of WASH infrastructure
Exclusion Criteria	Reference to roles in capacity building, policy and advocacy or other roles that do not touch on collaboration between sectors; do not include text that describes WASH problems as a result of general lack of intersectoral collaboration	Exclusion Criteria	Language not specifically alluding to WASH monitoring and surveillance as an explicit strategy of the organization
Typical examples	"Convene multiple sectors that impact and share responsibility in WASH..."	Typical examples	"The objective is to guarantee that the country has baseline information allowing for the monitoring of WASH services at different levels and count with rigorous evidence on key sector challenges..."
Atypical examples	"Their causes, barriers, and bottlenecks are all closely interconnected. Addressing them demand strategies that are not limited to education, but integrate adolescent health, nutrition, WASH, child protection, and social inclusion."	Atypical examples	"Research will also generate specific national evidence of the education returns (enrollment, retention, learner achievements) related to investment in WASH in schools, to be used in policy advocacy..."
Close to but no	"Another example in the WASH sector: the WASH BAT 2015 revealed that much of the current situation in the Bolivian WASH sector - especially the gap between rural and urban - is explained by lacking management capacities and weak sector coordination..."	Close to but no	"Experiences in Mozambique and other countries in Africa and Asia, show that it is vital to have sustained follow-up and monitoring activities to prevent regression to non-ODF situation."

TERTIARY CODES

Secondary root: Infrastructure co-benefits

Tertiary Code	Education link to WASH infrastructure
Detailed Description	Use to describe any WASH infrastructure investment in schools (more relevant to UNICEF) and benefits of such investments
Inclusion Criteria	Include text about WASH in schools as part of the organization's WASH strategy or education strategy; often found in the context of child welfare and education, equity (MHM); can be implementation related or about specific technology
Exclusion Criteria	Do not include text that describes aspects of WASH in schools unrelated to the organization's strategy or generalist statements about deficit about WASH in schools; also do not include text describing educating about WASH as a strategy (this is not infrastructure related)
Typical examples	"The programme will model integrated, evidence-based and innovative approaches and technologies in two municipalities, provide adequate WASH infrastructure and services to selected vulnerable groups, schools, health and nutrition centres, and act in emergencies."
Atypical examples	"UNICEF will support review and standardization of design of climate resilient rural WASH infrastructure in communities and schools prioritizing affordability and sustainability."
Close to but no	"...encompass the use of early childhood care and development as an overarching framework for health, nutrition, education, WASH and protection alike..."

Tertiary Code	Food security link to WASH infrastructure
Detailed Description	Describes how WASH infrastructure is tied to agricultural productivity (irrigation) and thus connected to the food security of a region or country
Inclusion Criteria	Include text about increased food security and agricultural productivity as a result of improved WASH infrastructure, especially as it relates to human health; must be tied to the organization's WASH strategy; maybe sometimes used in the same context as innovative solutions
Exclusion Criteria	Do not include text about aspects of irrigation, agricultural productivity, or food security that is not tied to the organization's strategy for WASH
Typical examples	"Expanding irrigation to ensure food security is simply not sustainable when water competes for other uses, including the production of electricity."
Atypical examples	"Strengthening the resilience of water supply and sanitation systems requires systematic risk assessment of short- and long-term impacts of climate change in risk assessments. Where water is scarce, safe reuse of wastewater, particularly in agriculture, not only provides a buffer, thereby increasing resilience to climate change, but also contributes to food production and the nutritional status of local and urban communities."
Close to but no	"...less than 5 percent of agricultural land is irrigated..."

Tertiary Code	Equity link to WASH infrastructure
Detailed Description	WASH infrastructure strategy link to equity issues in defined or undefined regions or countries
Inclusion Criteria	Include text that refers to WASH strategy addressing female/male disparities (i.e. menstrual hygiene), urban/rural disparities, disability, etc. Often used in the same context as WASH in schools, community engagement, etc.
Exclusion Criteria	Do not include text that refers to inequities in general without a WASH strategy context; must specifically address how the organization plans to address inequities through their WASH strategy/program
Typical examples	"National standards for WASH in secondary schools with a disability component and gender sensitive facilities developed and operationalized..."
Atypical examples	"More women and children will participate effectively in addressing health seeking behaviors, norms and actions to protect, promote and fulfill the rights of girls, boys, and women."
Close to but no	"A bottleneck could be a law on competition that unlocks the potential of private sector investments, inexistent capital markets, a trunk investment that opens a new development corridor or a source of clean water that unlocks women's time to participate in economic activity."

Secondary Code	Poverty reduction link to WASH infrastructure
Detailed Description	Describes a connection between investment in WASH infrastructure and reduction in poverty (linked to well-being and health of human population)
Inclusion Criteria	Include text about poverty reduction as part of the organization's motivation for investing in aspects of WASH infrastructure, especially as it pertains to health; can be community-based, country-wide or regional
Exclusion Criteria	Do not include text about poverty reduction and WASH without a connection (or justification) to the organization's strategy
Typical examples	"For example, in the water sector, Sanitation, Hygiene and Wastewater Support Service (SWAT) will be mobilized to work with Bank teams to identify opportunities to address poverty in water supply and sanitation projects, as appropriate."
Atypical examples	"Cost recovery and targeted subsidies: promote cost recovery pricing of key services such as power and water to ensure sustainability and possible extension to unserved populations, and apply limited subsidies on a targeted basis."
Close to but no	"A key assumption is that with improved quality of service, more households will be willing to pay for the services, thereby increasing the revenue for water committees or private service providers."

Tertiary Code	Renewable energy link to WASH infrastructure
Detailed Description	Use to describe text that links renewable energy (e.g. hydropower) to the water infrastructure strategy of the organization
Inclusion Criteria	Use to describe text that speaks to water infrastructure and renewable energy (aka hydropower); see this as one way to invest in water infrastructure - through renewable energy
Exclusion Criteria	Do not include text that describes renewable energy projects outside of the organization's strategy of water infrastructure; do not include text that describe a renewable energy project in general
Typical examples	"The Bank reached a record in hydropower lending of about US\$ 1 billion in FY11 for projects in Vietnam (Trung Sun) and Indonesia (Upper Cisokan pumped storage)."
Atypical examples	"The region's water resource practice is also strongly committed to multi-purpose development of water resources that taken into account the full range of potential water uses in urban supply, hydropower, irrigated agriculture, navigation, fisheries, and others..."
Close to but no	"Uzbekistan's opposition to Tajikistan's plans to construct the Roghun hydropower plant..."

III. COMPLETED DOCUMENT LIST

Document Number	Document Type	Organization	Date Range	Source
1	Global Strategy	UNICEF	2016-2030	https://www.unicef.org/wash/files/UNICEF_Strategy_for_WASH_2016_2030.PDF
2	Myanmar Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/Myanmar_PSN_2018-2022.pdf
3	Bangladesh Strategy Note	UNICEF	2017-2020	http://files.unicef.org/transparency/documents/Bangladesh_Programme%20Strategy%20Notes%20-%20June%202016.pdf
4	Bolivia Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/Final%20PSN%20Bolivia_100517.pdf
5	Vietnam Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/Viet%20Nam%20CP%20Strategy%20Note%20final%20March%202016.pdf
6	Papua New Guinea Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/PNG%20SN%20HEALTH%2023Feb%20Clean.pdf
7	Ukraine Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/Strategy%20Note%20Ukraine.pdf
8	Kyrgyzstan Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/Kyrgyzstan_Revised%20Strategy%20Note_02%2002%2017%20(without%20Annexes)%20-%20w%20RO%20comments%20and%20CO%20responses.pdf
9	Lao PDR Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/Lao_PDR_Strategy%20Note_12_July_2016.pdf
10	Mongolia Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/Mongolia%20-%20Strategy%20Note%20-%2025%20Feb%202016.pdf
11	Pacific Islands WASH Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/Pacific%20SN%20Consolidated_10%20October%202017.pdf
12	Sao Tome and Principe Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/Sao_Tome_Strategy_Note_2016.pdf
13	Ghana Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/Ghana_HEALTH%20and%20NUTRITION%20PSN_26%20Sept%202017.pdf
14	State of Palestine Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/State%20of%20Palestine%202018-2022%20Strategy%20Note%2012.07.2017.pdf
15	Mozambique WASH Strategy Note	UNICEF	2017-2020	http://files.unicef.org/transparency/documents/Mozambique%20CPD%20-%20%20WASH%20Strategy%20Note%20-%2028%20March%202016.pdf
16	DPR Korea Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/DPR%20Korea%20Strategy%20Note%20revised%2023%20Feb%202016%20to%20ROs%20over%202.pdf
17	Cameroon WASH Strategy Note	UNICEF	2018-2020	http://files.unicef.org/transparency/documents/Strategy%20Note%20-%20WASH%20-%20final%20sd.pdf
18	Cote d'Ivoire Strategy Note	UNICEF	2017-2020	http://files.unicef.org/transparency/documents/Cote%20d%20ivoire_CSD_CPD2017-2020_StrategicNote_10%2005%202016_FINAL_13052016.pdf
19	Moldova Strategy Note	UNICEF	2018-2022	http://files.unicef.org/transparency/documents/Moldova%20Strategy%20Note%20Final.pdf
20	Somalia WASH Strategy Note	UNICEF	2018-2020	http://files.unicef.org/transparency/documents/Somalia%201.%20Health.pdf
21	Somalia Health Strategy Note	UNICEF	2018-2020	http://files.unicef.org/transparency/documents/Somalia%203.%20WASH.pdf
22	South Sudan Strategy Note	UNICEF	2016-2018	http://files.unicef.org/transparency/documents/SSCO%20SPPME%20Programme%20Strategy%20Note.pdf
23	Morocco Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/Morocco_PSN_Health_11%20July_2016.pdf
24	Jamaica Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/Jamaica_Strategy_Note_Health_2016.pdf
25	Montenegro Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/Montenegro%20Draft%20SN%20draft%2027%2007%202016.pdf
26	Oman Strategy Note	UNICEF	2017-2020	http://files.unicef.org/transparency/documents/Oman%20-%20Strategy%20Note%20and%20Annex%20A%20-%2017%20July%202016%20-%20FINAL.pdf
27	Guyana & Suriname Life-long Learning Strategy Note	UNICEF	2014-2018	http://files.unicef.org/transparency/documents/Guyana%20&%20Suriname%20PSN%20lifelong%20Learning.pdf
28	Guyana & Suriname Child Protection Strategy Note	UNICEF	2014-2018	http://files.unicef.org/transparency/documents/Guyana%20&%20Suriname%20PSN%20Child%20Protection.pdf
29	Thailand Child Development Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/Thailand%20ECD%20Strategy%20Note%2026%20February%202016%20final.pdf
30	Thailand Education Strategy Note	UNICEF	2017-2021	http://files.unicef.org/transparency/documents/Thailand%20Education%20Strategy%20Note%2026%20February%202016%20final.pdf
31	Global Infrastructure Strategy	WB	2018-2025	https://openknowledge.worldbank.org/handle/10986/26768
32	Fiji Country Partnership Framework	WB	2021-2024	https://openknowledge.worldbank.org/handle/10986/35099
33	Nigeria Country Partnership Framework	WB	2021-2025	https://openknowledge.worldbank.org/bitstream/handle/10986/35098/Nigeria-Country-Partnership-Framework-for-the-Period-FY21-FY25.pdf?sequence=1&isAllowed=y
34	Bhutan Country Partnership Framework	WB	2021-2024	https://openknowledge.worldbank.org/bitstream/handle/10986/34971/Bhutan-Country-Partnership-Framework-for-the-Period-FY2021-24.pdf?sequence=1&isAllowed=y
35	Global Strategy	JMP	2016-2020	https://washdata.org/sites/default/files/documents/reports/2019-05/JMP-2016-strategy.pdf
36	Global Strategy	WHO	2018-2025	https://www.who.int/healthinfo/systems/sara_reports/en/

**UNIVERSITY OF WASHINGTON
CONSENT FORM**

**INTERVIEW TO SUPPLEMENT THESIS PROJECT: HEALTH ORGANIZATION
INVESTMENT IN WASH INFRASTRUCTURE**

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We are asking you to be in a research study. This form gives you information to help you decide whether or not to be in the study. Being in the study is voluntary. Please read this carefully. You may ask any questions about the study. Then you can decide whether or not you want to be in the study.

PURPOSE OF THE STUDY

The goal of this project is to investigate the extent to which large health organizations such as UNICEF, the World Health Organization (WHO), the World Bank and the Joint Monitoring Program (JMP) invest in the development of infrastructure specific to water, sanitation and hygiene (WASH). Through this investigation, we hope to further understand how certain health organizations function and their defined roles with regards to WASH infrastructure.

STUDY PROCEDURES

Interviews will be conducted through recorded phone conversations that will be later transcribed and analyzed qualitatively. The structure of the interviews will be semi-structured with questions that aim at understanding the true level of investment each organization has in WASH infrastructure development and why organizations pursue a particular approach. For example, are there active initiatives and projects occurring outside of what is stated in the strategy documents? Also, are there reasons for avoiding some activities and not others? A maximum of three people from each organization will be included in this research project, equally a potential total of 12 interviews. Each interview will be no longer than one hour. The total amount of time to recruit interviewees, conduct interviews, and analyze the content will be approximately four months. Subjects may refuse to answer any question during the interview process.

RISKS, STRESS, OR DISCOMFORT

Anticipated risks include stress or discomforts on the subjects' behalf associated with information shared during audio recordings of phone interviews.

Audio recordings of subject interviews will be shared with the research team and analysis of the interviews will be used in presentations and potential publications.

In the event of any distress or discomfort at any time during or after the interview process, subjects should contact Cecilia Welch at (708) 285-1861 or cxwelch@uw.edu.

BENEFITS OF THE STUDY

There are no foreseeable benefits to subject by participating in this study.

CONFIDENTIALITY OF RESEARCH INFORMATION

There will be no identifiers used in this project, but all names and contact information will be left out of presentations and publications. All names and professional contact information will be shared with the research team. Furthermore, due to the nature of the project, the professional status of subjects may be inferred without explicit disclosure of specific names and professional contact information, which may be considered a breach of confidentiality.

Government or university staff sometimes review studies such as this one to make sure they are being done safely and legally. If a review of this study takes place, your records may be examined. The reviewers will protect your privacy. The study records will not be used to put you at legal risk of harm.

USE OF INFORMATION AND SPECIMENS

The information and/or specimens that we obtain from you for this study might be used for future studies. We may remove anything that might identify you from the information. If we do so, that information may then be used for future research studies or given to another investigator without getting additional permission from you. It is also possible that in the future we may want to use or share study information that might identify you. If we do, a review board will decide whether or not we need to get additional permission from you.

OTHER INFORMATION

You may refuse to participate, and you are free to withdraw from this study at any time without penalty or loss of benefits to which you are otherwise entitled.


RESEARCH-RELATED INJURY

If you think you have been harmed from being in this research, contact Cecilia Welch at (708) 285-1861 or cxwelch@uw.edu.

It is important that you promptly tell the researchers if you believe that you have been harmed because of taking part in this study. You can call her at the number listed above. This number is monitored every day from 9am to 11pm Pacific Standard Time (GMT-8).

If you have questions, complaints or concerns about this study, you can contact Cecilia Welch at (708) 285-1861 or cxwelch@uw.edu.

The UW does not normally provide compensation for harm except through its discretionary program for medical injury. However, the law may allow you to seek other compensation if the harm is the fault of the researchers. You do not waive any right to seek payment by signing this consent form.

Cecilia Welch		4/13/2020
Printed name of study staff obtaining consent*	Signature*	Date*

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research, or if I have been harmed by participating in this study, I can contact one of the researchers listed on the first page of this consent form. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098 or call collect at (206) 221-5940. I will receive a copy of this consent form.

Printed name of subject	Signature of subject	Date
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Copies to: Researcher
 Subject

V. INTERVIEW GUIDE

Hi, my name is Cecilia. Thank you so much for taking the time to sit and chat. I really appreciate it. Is it alright if I record you?

Before you decide whether to take part in this interview today, I want to read through a few things should you have any concerns about participating.

- A. Title of study:** Health Organization Investment in WASH Infrastructure
- B. Investigators and supervisors:** I am a Master's student in global health and my thesis committee chair is Jessica Kaminsky, chaired by Jonny Crocker and Kenneth Sherr.
- C. Researcher's Statement:** I am asking you to participate in an interview as a key informant. You may ask questions about the purpose of the project, what I will be asking you to do, the possible risks and benefits, your rights as a participant and anything else about the project that is not clear. When I have answered all your questions, you can decide if you want to participate or not.
- D. Study Introduction:** The goal of this project is to investigate the extent to which large health organizations such as UNICEF, the World Health Organization (WHO), the World Bank and the Joint Monitoring Program (JMP) invest in the development of infrastructure specific to water, sanitation, and hygiene (WASH). Through this investigation, I hope to further understand how certain health organizations function and their defined roles with regards to WASH infrastructure.
- E. Purpose of the Project:** I am using interviews to supplement the data analysis I have already been conducting on publicly available strategy documents published by UNICEF, WHO, JMP and World Bank. These interviews should provide more insight and specifics behind the documents that are publicly available.
- F. Study Procedures:** In this project I will interview several key informants who work for UNICEF, WHO, JMP and the World Bank. I analyze the interviews and include the results and interpretation of the data in a manuscript for dissemination to academic journals. If you agree to be in this study, I will ask you questions about your role in the organization, the organization's role in WASH infrastructure, and the organization's interaction with other organizations. The interview will take about 45 minutes to 1 hour.
- G. Role of the participant:** We really appreciate your participation in this study. Your sharing your experience will help us better our skills as qualitative researchers and public health practitioners.
- H. Benefits:** While there is no direct or immediate benefit to you as a participant, this research will help me in completing my thesis and help interested parties further understand the strategies and roles of health organizations with regards to WASH infrastructure.
- I. Risks and discomforts:** While my questions are not intended to do harm to you as a participant, should you feel the need to decline to answer any question or to stop the interview at any time feel free to do so.
- J. Confidentiality:** During the interview, I will record you and write notes about the information you tell me. This is the information I will use for my analysis. I will transcribe my notes/recordings and put together the information from all the interviews. When I have put all of the information together, I will write up the results and interpretation that will be presented in my thesis defense and disseminated to academic journals for publication. I may quote statements that you make in the interview but I will not include your name or other identifying information. Despite these steps to protect your identity, it may be possible for people who know you to identify you based on your responses or other details that you share today.

- K. Voluntary participation:** It is your decision whether or not to be interviewed. You can decline to answer any question, and you can stop the interview at any time. There are no penalties if you decide not to answer a question or if you decide to stop the interview.
- L. Information on researchers and telephone numbers in case of any questions:** Is there anything you want me to clarify? If you have any questions, please ask. If you have any questions after I leave, you can email me at: cxwelch@uw.edu. I will follow up with a page of committee contact information after the interview.
- M. Verbal consent:** Do you agree to participate in this interview?
- N. Recording the interview:** I'd like to tape-record the interview so that, while we are talking, I can just listen to what you say. I will erase the interview as soon as I have typed it up. Is it ok with you if I record our interview?

*Please state your name and position you hold at UNICEF as well as your overall responsibilities in that position?

INTERVIEW QUESTIONS

Role of Organization

General: How would you describe the role that your organization plays in water, sanitation, and hygiene infrastructure in relation to health (i.e., health facilities, schools, communities)?

- Is there an infrastructure implementation aspect to what you have described that your organization handles directly?
- What dictates the direction and subsequent actions that your organization takes with water and sanitation infrastructure?

World Bank: While the World Bank is not a health organization, it is highly influential in determining the direction of some large health organizations such as the WHO and UNICEF. With that in mind, how would you describe the role that your organization plays in water, sanitation, and hygiene infrastructure (i.e., health facilities, schools, communities)?

JMP: How would you describe the role that your organization plays in informing water, sanitation, and hygiene infrastructure in relation to health (i.e., health facilities, schools, communities)?

WHO: Looking through the strategy documents, I noticed that the WHO does some monitoring and surveillance work but there is also some emphasis on working with the Joint Monitoring Program, a partnership between WHO and UNICEF. Can you describe how WHO operates separately from or together with JMP to achieve WASH monitoring and data collection goals?

Evolution of strategy/role

General: How is your organization's investment in WASH changing?

- Are the changing strategies influenced by anything specifically?
- What do you believe are the benefits and drawbacks to these shifting roles and responsibilities within your organization?

JMP: How would you say that your organization's role is changing with regards to informing water, sanitation, and hygiene infrastructure development? For example, is your data collection shifting from using indicators with a strong health focus to using indicators that include other sectors besides health?

- What influences your indicator selection?
- Do you think that any changes in your monitoring and surveillance methods (and how that data is subsequently used to inform decision making) increasingly reflect the multi-sectoral nature of health?

WHO: A lot of strategies from health organizations and non-health organizations that are closely connected to health are emphasizing the evolving, multi-sectoral nature of future work in WASH. From your perspective is the WHO a part of this evolution where they are thinking beyond their conventional roles (policy & advocacy, capacity-building, monitoring) to take on more infrastructure implementation?

- Can you give any specific examples of this? Specific projects? One positive example? One way that this could be done better?

Future Role

General: What are some future goals or aspirations that your organization has in terms of how they invest in water and sanitation infrastructure?

- Do you think there are important factors to consider moving forward that will further influence shifts in strategy?
- What would you consider to be the most challenging factors facing appropriate investment in water and sanitation infrastructure with relation to health by your organization?

JMP: Do you think that any changes in your monitoring and surveillance methods (and how that data is subsequently used to inform decision making) increasingly reflect the multi-sectoral nature of health?

Opinion

General: What kind of role do you believe your organization should have in water and sanitation infrastructure development?

- Infrastructure development in general?
- Why do you believe that?
- What are factors that you believe should remain completely outside the responsibilities of your organization when it comes to water and sanitation infrastructure?

JMP: Are there aspects of JMP's role as global data custodian that you believe should be different (or stay the same) moving forward with regards to influencing WASH?

- What about influencing WASH infrastructure development?
- Do you see a difference between the two?

Interaction with other organizations

General: Can you describe any coordination efforts or interaction with other health organizations around water infrastructure?

- How do you think efficiency can be optimized between coordinated efforts (e.g., the construction of latrines and the subsequent maintenance/regulation of waste)?
- Health organizations are increasingly recognizing the need to coordinate between sectors to achieve their goals (to meet SDGs for example). Can you speak to how your organization is putting this recognition into action?
- More specifically, can you speak to coordination efforts between the health sector and the water infrastructure/engineering/construction sectors?

JMP: Since the introduction of the Sustainable Development Goals (SDGs), the JMP has emphasized a more integrated approach to monitoring WASH. Can you describe what this means regarding coordination efforts or interaction with other health organizations?

WHO: Looking through the strategy documents, I noticed that the WHO does some monitoring and surveillance work but there is also some emphasis on working with the Joint Monitoring Program, a partnership between WHO and UNICEF. Can you describe how WHO operates separately from or together with JMP to achieve WASH monitoring and data collection goals?

World Bank: Can you describe how the World Bank interacts with health organizations regarding water infrastructure, or as health orgs would put it, WASH infrastructure?

Country-specific questions

General: In this country or region specifically, how does your organization's role differ from that of other organizations with respect to WASH infrastructure?

- Are there areas of overlap in strategies/roles/responsibilities around WASH infrastructure here?
- Are there any gaps that the current system - as it functions now - does not cover?
- How do you think those gaps can be filled (if they can be)?
- What is the largest WASH project your organization has been involved with over the last decade (i.e., longest time, the greatest number of resources, most coordination efforts involved)?
- Who were the partners involved in this project?
- What were the challenges associated with these projects?
- Were these projects in coordination with the government health ministry and other health organizations that have not been mentioned yet?

VI. INTERVIEW TRANSCRIPTS

INTRODUCTORY INFORMATION

Interviewer: Cecilia Welch

Participant: Fiona Ward, WASH Specialist at UNICEF

Date: 4/24/2020

Time started: 1:57 PM

Time ended: 3:12 PM

I: Interviewer

P: Participant

TRANSCRIPT

P: *I tend to speak quite quickly. I got a call this morning with Iraq and they're like, can you slow down please? If you need to, if you need to slow down, just let me know.*

I: No, it's great. I mean, the recording will help. I'll just transcribe. Yeah. Yeah. So I guess I'll start off with some introductory material and then we can get into the questions.

P: *Okay.*

I: So my name is Cecilia Welch and I'm a Master's of Public Health candidate at the University of Washington. Yes, so I guess before you decide whether to take part in this interview, I want to read through some obligatory material should you have any concerns by participating. So I'm conducting a thesis project as part of my master's degree, and this has inspired a series of in depth interviews with a number of key informants in health organizations. My thesis committee chair for your information is Jessica Kaminsky and is co-chaired by Johnny Crocker and Kenny Sherr all at the University of Washington. So I'm asking you to participate in this interview as a key informant and you can ask questions about the purpose of the project, what I'll be asking you, and possible risks and benefits, your rights as a participant and anything else about the project that's not clear at any time. And when I've answered all of your questions, you can decide if you want to participate or not basically. And so, through the consent form, you kind of read through the project brief a little bit, but I'm mostly interested in large health organization and large health, or I guess, efforts to invest in the development of infrastructure specific to water, sanitation and hygiene (WASH), and I'm hoping to further understand how these organizations function and their defined roles, specifically to WASH infrastructure as it influences health. And so I've already been conducting research qualitative research on publicly available strategy documents published by all these organizations. And these interviews should provide more insight into what's publicly available. And I will plan to transcribe all the interviews that I conduct and that will be analyzed and included in any interpretation of results. And written up in a manuscript hopefully for dissemination to a journal, or two. And should you agree to this study, I'll ask you questions about your role in the organization, the organization's role in WASH infrastructure and the organization's interaction with other organizations. It should take about an hour. And while there's no direct or immediate benefit to you, as a participant, this research will help me immensely in completing

my thesis. And as well as interested parties to further understand the strategies and roles of health organizations with more transparency, hopefully. And should you experience any discomfort at all during the interview - it's not my intention, there's no - my questions are not designed to do harm to you as a participant, but you should feel free to decline to answer any question or stop the interview at any time. And I think that's everything. Again, your participation is voluntary and there's no penalty if you decide to decline to interview. And I think I already gave you my contact information should you have any follow up questions after this. And you can contact me anytime, a year from now or two years from now, whenever. So, do you agree to participate in this interview? And do you have any questions?

P: First, I do agree to participate. Perhaps before we launch into the main part. Maybe I can just give you some of my background, but just a couple of things. A) I am just curious to know what UNICEF documents you have already reviewed that you mentioned them are publicly available. I'm just curious to see how they, how easy it was to find them and what you found. And also just to say, I think when I read in the disclosure form, it was going to be about - that you wouldn't be quoting my name in particular. I assume it'll be UNICEF, it'd be just generally about UNICEF. So I mean, it said that you wouldn't identify me but it just also "UNICEF gave some x y Zed", for example. Yeah.

I: Yeah. So to answer your second question first, I will potentially quote statements that you make in the interview, but I will not include your name or other identifying information. Despite this, it might be possible for other people who know you and know your role to identify you based on your responses.

P: *Sure, but they will be ascribed to being UNICEF responses.*

I: Yes.

P: *Okay. Okay. Sure.*

I: And your second question, I've been looking at UNICEF strategy documents, so program strategy documents.

P: *The WASH strategy document or the health?*

I: Yeah, so both. WASH strategy if I can find it, it's usually it's pretty hard to find.

P: *Really, okay. Well, I can send it to you. It should be I mean, if it's publicly available, it should be. Because, but well that's interesting, to know. I'll just do a quick note as it isn't easy to find, yeah.*

I: Okay. It's, I didn't really have like a very you know it my process for searching for the documents was like a little bit. I guess I just looked for country programs in place, like presently. And then I decided to search based on those countries - do like a Google search or a Scholar search based on the program documents that I could find. And I didn't really find that as - for all of the programs for all the country programs I couldn't find WASH strategy documents for everything. But I was able to find quite a few and

it's also important to include - for me, it's important to include more than just the WASH. It's definitely important to include the health strategy document as well.

P: Yeah, but just to say so UNICEF - So you've mentioned some good things in terms of the program documents in the country programs. So UNICEF, we don't, sorry, the country program document is done for the whole of UNICEF program, not just WASH, obviously. So for a certain period of planning, that should be available in the public sphere. However, the documents to prepare that UNICEF normally does what's called a strategy note and a situation analysis, I think the first one is a situation analysis. And then once we have done the situation analysis, which basically looks at the key vulnerabilities or the key trends, what are the key areas of concern in each of the different sectors, then from that it's distilled into the strategy. So what is UNICEF strategy to identify those key areas of concern over the period. So in most UNICEF programs, the planning period is for five years. And normally, the preparation for what's called a new country program starts at least a year and a half or two years in advance. Importantly, halfway through that country program cycle, there is a midterm review. So if a number of things have changed, for example, like COVID now or if there's been like - with climate often was not included, to the same extent that it should have been in a number of country programs. Maybe the focus was on water scarcity, but not necessarily climate. Then often there's a correction on those changes made to the the country program and the planning cycle. So in UNICEF headquarters we have I'm not sure why perhaps it's just it's a number of years before the end of the SDGs, the Sustainable Development Goals maybe. But our planning cycle is listed under a strategic plan and UNICEF's strategic planning period is 2019 - so 2018 to 2021. So we have just finished our midterm review of that. And we are, even though it's a relatively short number of years into it, we're also changing to scale up climate as well. Importantly, also WASH in institutions, especially WASH in health and healthcare facilities. So UNICEF, as I said, in most of our country programs, it's five years in headquarters for some reason, it's four years, but in emergencies, often it's three years or less, just because things change. You don't know how many refugees there will be. So yeah. So that's the background. So as I mentioned, the country program documents should be publicly available, but the background documents, like the strategy note and the situation analysis are often just for internal use. And so under is a WASH strategy. It's from 2016 to 2030. That definitely, and I know there's just - one has just been released for education, I don't know about health. I should know the answer, of course I don't. But I would imagine there's also one for health or perhaps one that's being developed now. So basically, what does that mean to UNICEF? So if something is included in the strategy, often then there are, shall we say, indicators which are used. So for example, what we did with the midterm review of our strategy now is that we included an indicator about the number of countries implementing climate WASH programming to a certain degree. So we didn't have - while we had climate indicators before, we didn't have a WASH climate one. So we've introduced that. That's just to make sure that whatever is highlighted has been a flag in the actual strategy. Importantly, as mentioned, is monitored on a yearly basis within UNICEF so every program in UNICEF, whether WASH, health or education, each year they have to monitor what's called a strategic monitoring question, an SMQ. And we try to make sure that when we ask country offices to measure certain things then that we report upon these. So now that we have a new indicator about what climate and in the strategic plan, we will be measuring this on a yearly basis between now and the end of the strategic plan. And then next year, I believe we'll start developing UNICEF's new strategic plan for the next four years. So that's the

background. So yeah, so just to say, the background documents are not normally public, but I guess it's a matter of how do you find it? So I'll also just write a note to myself that can I Google our plan.

I: I did find some documents, some strategy notes through Google. So I guess my concern would be, since they're only for internal use or predominantly for internal use, would that be a problem if I incorporated those into my research?

P: *No, I don't think so. I mean, often those are developed, certainly in my experience, but the most recent experience I had was in Jordan and I was there actually, I forgot to introduce myself - which, I'll do that in a bit a bit - but and what we did was UNICEF convened all the stakeholders for WASH and we went through the main findings from the situation analysis, and that was used in consultation with key sector partners in the government obviously, to flag which areas were going to be a key priority into the strategy notes and then from that into the country program, so no I'm sure it wouldn't be an issue for it to be shared. No.*

I: Okay, great.

P: *Because it's I mean, it was done in consultation with the sector so I don't think there should be any surprises. But before I forget, so my background, so I am a hydrogeologist. I've been - I joined UNICEF in 2005. But I've joined and left different things. I have been in New York for almost a year and a half. And my position is a water and sanitation hygiene specialist. I'm a WASH specialist. And my particular area of interest is on water scarcity and climate change. So basically, my role is really to help our country offices, give them technical advice on how to make our programs more climate resilient, and how they - what they can do to mitigate against water scarcity. So that's it. And before that, I was in Jordan on the Jordan country program for four years. Before that I was in Bangladesh for two and a half years. And I worked with UNICEF also in Kenya and the Somalia office. And, and in Sudan, and we have an office in Copenhagen in terms of emergency things. So I've done that. But I've also worked in Nigeria and Ghana and Haiti. Um, yeah. So that's it. Yeah. So that's my main programmatic background. And I really, I think UNICEF is a really fantastic organization, not just because I work for them but because I think, I mean, I have worked for an NGO before. And the big shock, I think, leaving the NGO and joining UNICEF, is that often in an NGO, you don't have a higher level of support. There may be somebody in headquarters, but there's only one person in there running around doing different things. If they don't know the answer, there's no one else to help you. One thing that I really like about UNICEF is a structure, you have field offices, you have your country office, and then there's a regional office, and there's like lots of experts and support to help you with your programming. Importantly, what I didn't mention was, when the country program is being developed, we also engage with our regional advisors who actually spend time going through and making sure that they agree with the logic and the structure, and then they are really good at flagging, "Well, have you thought about this, thought about that? Is this realistic? Or is that realistic? Or is this your main priority?" But also then you have people at headquarters like myself, so that's why I think it's really good that in headquarters, you have people who've worked in a number of different countries who can say well, actually, this didn't work in this thing but it's working here, for example. Also just our partnerships that we have. We have really strong partnerships with really strong technical universities as well as partners. And the other, the second thing that really struck me when I*

was making the transition from an NGO to UNICEF, is that UNICEF's primary partner in a country is the government. So with an NGO, I found you are installing a borehole, you're putting in a hand pump, you're working in a particular location. And when you finish your work, you're finished. But I mean, you're working on a piecemeal or project by project basis. What I liked about UNICEF is that UNICEF can really influence how the government allocates funds that the government is doing, drilling those bore holes, and not an NGO in terms of the sustainability. Or else UNICEF can see okay, boreholes have been installed, but actually the solar pumps - the solar systems weren't properly designed. So rather than repeating the mistake, how do we go about doing this, you know, so I mean, that's...Okay, so for example, we're developing a manual on solar installation, but the issue isn't just about the manual on solar installation. The issue is, how do you ensure that for countries that they have the technical capacity to be able to properly design and install. And it's not about having a manual, it's making sure that that manual is in a local language, or else there being hands on practical training, or else that you have a whole fleet of engineers, often which, who UNICEF supports initially to get trained to that you are helping the private sector or you are helping the government and the people start from the government, but after two years they leave for the private sector, but that's, that's okay, at least they're staying in the country and they're helping build that capacity. So that's to me, one of the main advantages about UNICEF that you have much more leveraging power else, for example, we're in discussions now with some agencies about, well how do you make water systems more energy and water efficient. But UNICEF doesn't have - I mean, you're talking about like 10s of millions of dollars. So UNICEF doesn't have that in a country program, mostly, but it can cooperate with other institutions that have that money, or the private sector who want to get involved. So I think that's what I really like about it that A, you know, in one day you could be dealing with a water system in Uganda, for example. The next day you're talking about capacity building in Haiti. So it's really varied. And I think there's a huge opportunity to do some really great things. And that's why I mean, I'm very happy that UNICEF and WHO are working together with the Joint Monitoring Program. We have a really fantastic team of people in our office - well, whenever we are there. But um, there's, I mean, there really, I mean, it's great that you have people who want to do just really the right thing and to have that technical capacity.

I: Definitely. Yeah. Thank you so much for that background information. Um, yeah, sounds like you have quite a background. Um, but yeah, I'd like to jump into some of the questions if that's okay.

P: Sure, please, yeah go ahead.

I: Okay, so, um, how would you describe the role that your organization that UNICEF plays in WASH infrastructure, and I know that you're not specifically looking at health and health facilities, schools, communities or whatever, but you might be able to answer this question in more of a broad sense.

P: Okay. So UNICEF is a highly decentralized organization as perhaps the biggest thing. So, while we have the WASH strategy, the programs which are designed on a country office level are highly varied. It depends on the background of the WASH chief, their priorities, the national priorities of the country depends on the capacity of our staff, for example, what we're trying to do is to move away from, you know, what we're trying to do is basically for our staff to consider using renewable energy. So far, often that has just been down to our staff who have experience in renewable energy. And our staff who don't

have it, often don't incorporate it, but that's not correct. So that's exactly what we're trying to do with this capacity building, not just for UNICEF but the whole sector - is to make people more comfortable with a technology that we feel has really huge potential to be scaled up to help really bring people up the water service ladder. So to go back to your question, UNICEF works at a global level, regional level, national level and even sub national level. So for example, we often find that boreholes fail after a short period of time. Everyone is aware of this, sometimes they last for a really long time. Other times they don't and they fail for various reasons. Either the borehole wasn't drilled properly, the borehole wasn't cited properly, the borehole wasn't installed with the right technology, pumps out at the wrong depth, or else everything else was working, however, nobody would pay the fees on the borehole wasn't maintained. So with all of this knowledge for decades, we then will work with a partner - and in this case, we worked with a Swiss partner - to say okay, well how can we professionalize the drilling of bore holes? Not just for UNICEF, of course, but at a sector, at a global level. So then we basically developed these technical guides on what you need to consider to drill a borehole properly. Sounds very basic, but that's it. So UNICEF, so we did that at a global level, and then insert certain countries, the government asked us to help them do training for people at certain levels. And we did that. So that's where we influence by identifying, for example, like Iraq. Iraq, because of the various restrictions, it has suffered over a number of decades. It doesn't - and also, because of perhaps their high dependency, and also their large quantity, vast quantities of reserves, of oil reserves - they haven't really been looking at solar. However, we think that they perhaps could scale up on solar. So part of that is okay, well, we've done a pilot in three things. So the first thing is that we would do an assessment of that system to see has it worked, what could we have done better? We're all still learning about solar as it evolves, but then not just upon that. And importantly, what are the bottlenecks to scaling up solar in a country like Iraq? There are many things, there is importation tariffs, there's ability, there's capacity to train personnel, or spare parts, the whole list of things. So UNICEF would be involved in doing what's probably called a bottleneck analysis to find out, okay, well, what do we need to do and where are the bottlenecks and where are they at in different regions. And so once we put in mechanisms in place with the government to address these, then the whole sector benefits, and it's the same thing with infrastructure for health care facilities, for example. So UNICEF and WHO have worked together to develop the WASH FIT tool, which is basically doing an assessment now of what are the healthcare facilities like, where are there gaps and how you do develop a plan for these? UNICEF has also been involved in development of national standards for WASH in schools, for example. So we often - we don't have a global set of standards because it depends on the country and the priorities like in Jordan. They were. They had much higher standards than in other places, but still, it's important that people move along the ladder. So this is where the JMP comes in, because you're flagging to the national government: "Hey, this is the data which suggests that either, perhaps there needs to be a change in budget allocation, because while the facilities are there and maybe your JMP data tells you, 'Well, there's a toilet there, however, it's not functioning.' So maybe you need to improve the allocations to a national budget." So to try to circle back to where I started from, UNICEF does influence things at a global level in terms of partnerships with various partners to try to ensure that we are, for example installing climate resilient services. So we do risk analysis, we try to ensure this is factored into the proposals that we develop plus the projects that we implement. Then we also do capacity - we do like risk analysis in the countries we do bottleneck analysis to find out okay, what are things working, where are the priorities? Is it the importation tariffs for example of equipment for hand pumps, for example. Are there - we had this situation in country where actually the boreholes

were failing because the hand pumps were failing. And when you looked - when we did it, actually, there was no proper quality assurance of the hand pump of equipment coming into the country, and that they were made with really poor quality materials. And because the water was fairly - it was a little bit acidic, it was really, sorry, it was quite an alkaline, it was actually corrode - it was basically eating up the components of a hand pump because it was very cheap, and they didn't install with stainless steel, or any kind of powder protection or anodized protection. So with that in place, because we didn't find that that would try to impose standards that basically all the hand pump manufacturers would need to adhere to, and that if anyone in the sector is purchasing, that they would do some quality assurance of this. And so it's standards, it's capacity building, it's trying to improve the monitoring network. For example, with the WASH facilities, which are constructed in schools, that we get the monitoring incorporated into the EMIS, which is the Education Monitoring and Information System. And that's because then often there are dashboards and schools can be monitored on their performance. And if there's constantly failure in terms of WASH functionality of those systems, that is - that acts as an encouragement for a government or a budgetary allocation to a certain school to help trigger and improve those. Or that - if the school gets the budget, they decide, actually, I'm not going to spend it on painting the classrooms, I'm going to spend it on actually making sure that the toilets function. So I think so UNICEF - so there's lots of different points. And it really depends on the country. But often there are global things, like there's global advocacy, we've been working with the regional office in terms of highlighting the impact of water scarcity on children. We've done a lot of work in terms of, what is the impact of girls or women having to walk, you know, 10 kilometers to collect water. So what is the impact of when you install a solar system with multi - like a solar network? Like I was, I did a paper yesterday on Malawi. So where we transitioned from boreholes with hand pumps that often would run dry in the summer because water levels fell down below the levels of the suction capacity of the hand pump to a solar system that had a network and storage capacity, which meant that you didn't have - we had multiple collection points, and importantly, at the primary source of water was going to the schools or the healthcare facilities, and then to the community, but not the other way around, which is normally the case. Normally, there isn't enough water for the school and health care facility. So that's a part of it. We also then like pilot different technologies. In this case, we would use advocacy of so here's the cost of it, here's what we did, here's what we should have done better. And it's always learning. Here is our plans to scale it up. And if we have partnerships agreement, like often UNICEF, because it's the lead agency for WASH in humanitarian situations, often UNICEF does the coordination at a national level in an emergency response like now with COVID. Or if, for example, in an earthquake response, then UNICEF would be monitoring and would be basically doing technical briefings and giving advice on technological approaches. Yeah.

I: Okay. Great. Um, and to follow up, is there any kind of infrastructure implementation aspect to what you have described? Do they have teams on the ground? Do country programs have teams on the ground? Engineers that work on the ground?

P: Yeah, most of our - so UNICEF has a budget of about a billion dollars for WASH every year. About half of that is for emergency, over a little bit over half is for emergency purposes. The rest is for development. But yeah, most I mean, most - we have over 700 WASH staff. Most of our staff will be engineers. Civil engineers, and, but we are trying to expand that into - I mean, that's where most of them would be and often they're, they're also electrical engineers or civil engineers, mechanical engineers, but from the hard

science part. But we are also increasing the number of people with a water resources background like myself, or also with a social mobilization or public health background, which increasingly is, which obviously is really important because what has happened in the past - not just with UNICEF - but a borehole is cited but people don't use it because the whole social aspect wasn't looked at or how do you get people to create a demand for safe water when people don't like the taste of the - I mean, it's really how do you get people to accept chlorinated water in a cholera emergency because they don't trust it? They think it'll make them sterile. I mean, it's really fascinating. So to go to back to your question. Yes, absolutely. We do a lot of infrastructure work. UNICEF often works through contractors or partners or often the government. In most country offices perhaps we give them money to the government and they would undertake the construction in partnership with UNICEF. But often, like when I was in Jordan, we actually had I think in one refugee camp, we had about \$61 million worth of infrastructure, which was boreholes because we were - before that were trucking water. And there was also concerns about what happens if there's an interruption to supply. So it's borehole construction, water network installation, where there's almost like 80,000 people living. How do you do that safely? There is wastewater because people had tanks, and how do you ensure that there wasn't any contamination? There was a wastewater treatment plant because you don't want to be transporting wastewater. You know, and that's how it was. People were transporting - I can't remember - 80 kilometers or something down the road and contributing to traffic, etc. So absolutely, we do a lot of infrastructure. What we're trying to do now, and we have been doing it for a really long time is making sure that whatever you do is the best technological solution. And not just because as I mentioned, someone has experience in solar so they're doing solar. But actually maybe something else is - or sorry if they're installing hand pumps, because that's what they've done. But actually maybe a hand pump isn't the solution. Maybe there's other solutions. We're trying to make sure all of our staff are aware of the best technological choices. But yeah, so we, we're also - we do a lot of direct contracting ourselves where we would then engage some oversight, some construction supervision, in terms of health and safety, etc. We're now also scaling up our environmental and social safeguards. How do we ensure that that's done consistently? That's also an area that we're now looking at as well.

I: Okay, great. Yeah. Um, do you think that what you said about the best technological solution or choices, is that a big driver in what dictates what actions you take in terms of WASH infrastructure implementation or is that just kind of like something that you think about along the way?

P: No, no so I mean, for example it also depends on how it grows. Like the experience in Jordan - I'm just talking about that because it was a very unusual situation because UNICEF was responsible for the provision of WASH services to refugees in the camp. And we were fully responsible. The, this is a bit sensitive. **So please don't include this. [But like the government were very clear that they were not involved. They were involved in health. And they weren't involved in education, but they also weren't directly involved in provision of WASH services. So it was very very clear that the Syrian refugees in Jordan weren't going to be going away. But the government had very very strict standards. You can't - they had very strict discharge wastewater standards, which we had to adhere to. Obviously, Jordan is one of the most water scarce countries in the world. So how do you minimize the impact of obstructions in already a very obstructed, over-obstructed area. So all of these things were coming together. But UNICEF - I think in that case it was very interesting because we realized very early on that tankering**

water in and then was not sustainable. Drilling boreholes wasn't necessarily the only solution. Obviously then, and then tankering wastewater around a refugee camp with kids running everywhere isn't safe either. So then, as an organization, we decided, okay, we need to build a much larger wastewater network. And also because it was pretty clear that people - that it was in a rural, that it was in an urban area, so people even if the refugees went back to Syria tomorrow, people would still live in those shelters. So it was a worthwhile investment in terms of primarily public safety and public health, but also just because it was the right thing to do. And also the fact that we had had problems with truck drivers going on strike, and then there's no water supply. So we're in a very vulnerable situation. So in that respect, we decided this is the right thing to do. We didn't have the funding commitment upfront, but UNICEF did mobilize its resources. So we did get some donors. And importantly, those donors agreed to fund for the period of the construction because often in an emergency, you have very short term funding. So you're very limited to then what you can construct and even if you know that a borehole on the water network is what you need, often you just have enough money to do the boreholes but not the network. So in this case, we had the flexibility of having an additional four years to construct a massive, really an internationally bid contract. Because that's what we thought was the right thing to do. And we started it without having the full funding because we did it in phases to make it easier. And I think that was really the best thing. So often what we do, obviously if we have no funds to do something we can't actually complete it, we can't even start it. If, sorry if - so, if we think it's going to be impossible, but we can definitely mobilize, that's what we did. We felt this is the right thing to do. Um, and we did it in phases and the funds came in, and absolutely no questions asked. So in other places, and yeah, we just find, for example, at the border then, at the Syrian Iraqi border, at the Jordanian border, we had all of a sudden, over the matter of weeks, we had a build up from a couple of hundred people to 20,000 people that went up 100,000 people. It was the desert in Fahrenheit I have no idea but it was hot. It was basically about 45 degrees centigrade. So we decided, okay, we have to, we were tankering - and in the end, then we just drilled our own boreholes and constructed the network in the desert, because it's the right thing to do.]

And yeah, so yeah, so just to answer your question, we do a lot of construction. Mainly are, perhaps water would have a stronger proportion, and then sanitation, but we do a lot of mobilization of communities in terms of community approach to total sanitation. So UNICEF isn't constructing the latrines but the community is building the latrines in terms of ownership. So that's what we tried to do as well. Yeah.

I: Okay. And then, so, with the projects that are decided, whatever infrastructure is decided to be put in place, what are the primary drivers or like, what primarily dictates that like the direction that UNICEF is going to go and do you think those primary drivers are changing? Maybe not immediately with COVID? But in a general sense?

P: Well, I think, in fact, the question, um. I think, I think it all stems - apart from COVID, of course - but it all stems, for example, when the country offices have done their situation analysis. What are the key vulnerabilities? Where are the people - the most vulnerable children living? What are they facing? So even with the JMP data, I mean also in some places the governments just don't accept the JMP data, they will just say, actually, that's been misinterpreted. And often we're really stuck about the whole politics of it. So where a country has accepted it, even the JMP data just differentiates between rural and urban, and then obviously, the national figure. But then you have to delve deeper into saying actually

well - actually most of the budget is going to five governorates, but not it's not going to the other three which is where 20% of the people live. However, but they're living in extreme poverty. So what we have done in countries that have also done a vulnerability analysis. So how, like what are the main - so the whole point of the vulnerability analysis and the situation analysis: Okay, where are the key issues that need to be addressed? Once they are understood then the country program is designed around that. And, and that is the driver. The driver is, having done that analysis, what are the key things that need to be addressed? UNICEF won't be able to do everything. But at least you can flag, okay, to others, and do an advocacy campaign. For example, what is the impact of water scarcity on children in the Middle East or in a country? You know, how will children be vulnerable to the impacts of climate change in Bangladesh? Then UNICEF releases a publication about it and mobilizes some kind of a discussion on it. But that would guide. So really, the starting point of everything is the situation analysis, then the strategy note to develop how you're going to address those. And that goes into the country program. And then things will change en route. Like now a lot of things are being changed by COVID. But the whole discussion on COVID, it's also I mean, how can you talk about, you know, maintaining hygiene when you have no access to water? So then this is the flag. So people have no access to water. Why? Because either there's no water available, or the demand of the sector is too high. Or, people can't afford it, or they just can't - it's not accessible to them or accessible to them in a safe form. So what are those? And how does that prioritize? So we're definitely, I wouldn't say we're definitely moving away from infrastructure, but it's more balanced that we're working at different levels. So the drivers, if you see there are, for example, in a number of countries in the Middle East, leakage is a huge issue. So if we see that the government wants to drill more boreholes, that's not the solution necessarily, or it's not the solution to transport the water over a network of 400 kilometers. The issue is how do you address that leakage?

I: Mm hmm.

P: *And also what is the impact of that leakage, or else, even when people do have water, and it costs almost nothing for them to use, which is great. However, then people don't value it. So that's not the right solution either. So it's also I mean, UNICEF has not really been involved in advocacy in terms of allocations for drinking water. But as water competition increases, how do you ensure that the domestic water volumes are guaranteed, and they're not all consumed by people growing tomatoes? Because it's easy and cheap for them to do it? Not necessarily because they can sell them but just because yeah, if they sell a ton, great. If they sell two tons, even better. But the whole amount of water to produce that difference is enormous. That isn't the best way to do it. So I think it's really about - I mean, essentially UNICEF works to improve the sustainable access of safe water to kids and their families. So what are the drivers driving that? And, obviously, sanitation. How do you ensure the dignity, whether - and also importantly with the move from the MDGs to the SDGs is that it's not just about household water anymore. It's about schools. It's about health care facilities. And that has been a big driver. And this is where the collaboration with other UN agencies comes in. With WHO, for example - that now the Secretary General made an announcement about really scaling up access and healthcare facilities and this is where the JMP comes in. And it flags actually, x proportion - I can't remember off the top of my head - of health care facilities don't even have access to water, let alone safe water. They don't even have access to water. How can you talk about a safe birth or how can you talk about vaccinations or*

how can you talk about basic care if they don't have water, you know? Yeah, I mean, this is where I think - it's about the analysis, it's also just having triggers like the JMP data. Like certainly when I was in Jordan, the JMP data on schools had just been released. And it caused a real shock because the Jordanian government were quite confident that actually their schools, the access to WASH was at a very high level, when you actually looked at the data and the definitions, they weren't. And that was a that was quite a shock.

I: Mm hmm. Do you think there are particular factors that you're considering now? I mean, maybe your role would speak to this with climate change and water scarcity.

P: *Yeah. Things changing?*

I: Yeah. Important factors to consider that you perhaps, like - that UNICEF hasn't considered in the past that are influencing strategy that we'll see more and more of as we go further into the future?

P: *Well, I would say I mean, it depends on what the time frame is. If I compare our programs now, compared to 20 years ago, there's a lot more focus on community involvement, especially this whole transition from latrine construction to community approaches to this, there is a lot more engagement of the private sector. For example, how do you get the private sector - how do you create a demand for something? Beforehand perhaps we were trying to focus on meeting that demand, like providing people with latrines. And now it's how do you create a sustainable demand? Not just that you have the demand, but how do you ensure the private sector or people can - first of all that it's affordable, and that it's up to a certain standard. Which is where, I think UNICEF comes in with its standard designs or working with the sector on national standards, for example. But then how do you ensure that there's a private sector there, or even to go back to solar - how do you ensure that there's a private sector there to be able to meet that demand? And importantly, I think also the focus for the whole sector, not necessarily just UNICEF, has really moved in terms of sustainable business models or sustainable delivery models. The focus is on the sustainability of whatever we install must operate for at least, just say, 20 years. So what factors do you need to consider? You need to consider, is there enough water? Will this be flooded? Will it be washed away? Will a cyclone hit? Will a population even be here? If you have a very sturdy latrine that is kind of resilient, but the house people are living in is not, how do you address that? And but also importantly, how do you address the capacity of the community themselves? So I think for me, I mean, I know I'm not perhaps not the most coherent, it's a bit all over the place. But for me, it's really the focus has been on less supply of a water point to it being more of a service. Being a sustainable service, such that you're looking at how easy will this system be to maintain? How will you get the supplies to do it? How do you ensure that people think it's really important to have a solar system instead of going down to the river, for example. How do you get people to understand that diarrhea isn't normal? I know it sounds odd, but, you know, it's there. There's a sense that well, people get diarrhea, people get malaria, people get cholera, you know, and that's, you know, it's endemic. I think perhaps the biggest thing is looking at the who, looking at the professionalization of the water sector in terms of standards of borehole drilling, the monitoring, the fact that abstraction - that there's such inefficiency in water, so it's not about drilling new boreholes, it's about using the water you have more effectively. It's about managing the demand - effective water demand management. How do you ensure people have a value*

of water. For example, going back to Jordan - but when I was in Jordan, my water bill for - I can't remember - two or three months, was the same as my colleague who had six people living in her house because of the whole block - or two things: one was the whole block tariff structure, such that it wasn't really dependent upon what you used. It was to a certain extent, but not really. It didn't really incentivize people to conserve water. And because I think the Middle East has the highest rates of water subsidies in the world, it wasn't really respected as being a resource, which I never really understood, because it was so cheap, you know, and then you had illegal abstractions, you had people growing their tomatoes with the water, which was illegally been abstracted. And then you had huge drawdowns in certain parts of the country, you know. So yes, I think there has been quite a drift. I think also perhaps seeing SDG 6.1 and 6.2 as being part of the larger SDG where water resources and ecosystem management and integrated water resource management are all together as opposed to - because, you know, if you don't have an obviously sufficient access to water, not going to reach 6.1 or 6.2 or even if the gains that you have made, maybe you will lose them, you know. But yeah I think yeah, definitely climate resilience in integrating climate risks, as well as other DRR principles. I mean DRR was more so, was coming anyway. But climate, definitely. How do you predict it? What do you do in places where there's no data? Well, you know, you can always at least start with your data going forward. That's why I think UNICEF is definitely moving away from a focus on civil engineering to having more specific utility management expertise, hydrological expertise, water treatment, I mean, very, very specific people in environmental and social side safeguards, for example.

I: Ok interesting. What do you - what would you consider to be the most challenging factors facing appropriate investment in WASH infrastructure? That UNICEF is facing?

P: *I think it's the unpredictability of financing of funds. So as I mentioned, often in a humanitarian situation, which is where half of our funding comes from, often the funds, I mean, it's incredible, even with all the various improvements into various international commitments, but you often have funds that last six months. You can't build anything sustainable in six months, because then you're just spending money on tankering. And that's, I mean, who wants, I mean, not just the cost of tankering, but as I mentioned, I mean, in Jordan, we had truck drivers who went on strike the day after we have signed a new contract agreement with them. You have 80 to 100,000 people living in the middle of the desert, 105 kilometers from anywhere. How are you going to get water to them? I mean you're in a very vulnerable position. So I mean, for me, having the donor community who understands that building back better involves a commitment to proper understanding of climate risks and the time required for that. Plus, ensuring that you have the right construction done to the right standard. And you have mechanisms in there and you have a defect, you have time for a defect liability period, for example. It sounds really basic, but you need to have - certainly in UNICEF systems, you need to have the contract valid or the grant valid for a year to cover that, ideally. So when we were talking about the refugee camps, for the really big ones, we - the infrastructure was constructed from 2013 to 2018 initially, and then with the main bulk of construction over three and a half or four years, but we were very lucky. We advocated with the donor they understood because they were really excellent. Others, they just you know, that's how their funding cycles are. So I think that's, for me that's the biggest restriction. If you have short term funding. I mean, UNICEF has internal loans, we have internal funding for emergency. So for times, we don't have the funding coming in, or else there is a gap. And it's also the predictability. Like some of our*

main donors, we could be receiving certain funds for one year, but then there's an emergency elsewhere and that funding goes elsewhere. So - and also that people understand that if you construct infrastructure, you need money to keep it going. And refugees can't pay. I mean, in Jordan, people were earning when JD was basically \$1.40. I mean, that was the, you know, a standard set. But people were earning very little. So how can you expect them to pay for services? I mean, it's a very complex discussion. But you also need to know that when you're constructing something, not just that the funding will last, but that there's also an acceptance that just because it's constructed, it won't run on air. You still need to ensure that the water meets the national drinking water quality standards and the discharge meets the national discharge standards. And that takes time, you need to make sure that people aren't illegally connecting to the network, need to make sure that people are getting sufficient access to water and that still requires a lot of support.

I: Okay, that's very interesting. So in terms of interaction with other organizations, I know UNICEF coordinates a lot with WHO and obviously JMP. But I'm also interested in how you may coordinate with World Bank. And I know the World Bank does a lot of infrastructure work. They're a huge source of money for infrastructure. But yeah, if you could describe, like, on a general level how - any coordination efforts there?

P: *Yeah, so I mean, so UNICEF works at different levels. So as I mentioned, so some of the people in my team - certainly, I don't, but my boss has attended, for example, the spring World Bank meetings and she has met with other people. We've worked for example, in certain countries where we know the World Bank is giving the government money to drill boreholes. So we will advocate with the World Bank and with the country representative of the World Bank to ensure that whoever they choose ensures that all their staff have done a drilling course by UNICEF. So, like, how do you ensure that the boreholes are going to be supervised at the level that they need to be supervised? If not, you'll have high rates of failure. So there is some coordination - like we have a staff member - I mean, we have people who used to work for the World Bank. So there is a lot - there is coordination at the headquarters level, there's certainly coordination at the regional level, perhaps just across the regions to different degrees. But certainly in country - for example, UNICEF has worked very closely with the World Bank on sanitation projects in Nigeria. And that's basically - often the chief of WASH will go and speak to the World Bank focal points there. And they'll - if they know that the World Bank is going to be giving money to the government, how does UNICEF influence where that gets spent to ensure that the most vulnerable areas from our situation analysis or the vulnerability analysis are prioritized. So we will do our best in terms of influencing where that money gets spent and how it's spent to ensure that the standards are there. I mean, the World Bank is technically very strong, of course, so yeah - so there is coordination there's also coordination with the European Investment Bank, other - ADB, very strong - it was our South Asia office, there was lots of coordination. We also work with - so UNICEF is the global lead agency for humanitarian, so we have a WASH cluster, and there's lots of coordination like 10s of, hundreds of organizations are part of it. And we also do like lots of technical collaboration. We're also leading in terms of solar technologies, online courses, we work with lots of different partners to design those and to run them with different manuals. And certainly out of country office level, UNICEF would normally do the coordination and do the annual planning for the sector to try to ensure that their resources are coordinated, and that there isn't a lot - I think one of the main things in terms of humanitarian*

coordination is trying to ensure that the resources are spread evenly enough just within five kilometers from the base where people are living, which happens a lot. Like how you ensure that actually the areas which are most need - even if they're further away, or they're not beside the main road - that they are actually being reached. So there is a lot of coordination going on at a country office level. Yeah.

I: And with WHO, coordination there, I guess I kind of have an overall understanding of what the WHO does versus UNICEF but it's kind of sounds like WHO is more - they influence policy a lot. And I guess like, I'd like you to speak more towards that collaborative effort and how JMP is kind of working in between you as well.

P: *Sure. Okay. Well, perhaps let me do the first one first. So, perhaps I mean, when you speak to Irene and Emilia, and please push them to give you a date and tell them honestly, because it's really, this is their role, this is their area. So my understanding, so certainly from a water point - so for example, WHO has a very strong global team - I mean you're talking to them yourself but they have a very very strong team of people in Geneva and they also have regional teams like UNICEF does. But as far as I'm aware, WHO have less in country staff than UNICEF. And absolutely right, they do influence policy. They do a lot of capacity building, they do a lot of data strengthening with the governments, but they're not necessarily implementing. So they're working on water safety plans, which is fantastic. But they don't roll that out at a scale that UNICEF would roll that out. So UNICEF is a lot more implementation focused, than WHO. I know that there's a lot of collaboration with - for example, WHO is the lead agency responsible for water quality at a national level. So WHO would work with the national government in terms of water quality standards, water quality mechanisms, testings, facilities, etc. Plus data collection. UNICEF does support where WHO isn't present. But um, yeah, and WHO is also very strong in terms of health care facilities. They have been driving the minimum health care facility standards, etc, etc. The eight - I can't remember - the eight key steps I think - Irene and Amelia can tell you because they're focusing on health care facilities. And, um, but yeah, so the WHO is a lot more in terms of, yeah, the policy, the standards, the capacity building, implementation of structures. But not necessarily rolling them out. Yeah, that's my understanding. But yeah - I mean, I've worked with them just in terms of climate resilience, sanitation - because that's also one of their concerns because of the potential for contamination. And I was involved with them in terms of doing water safety planning, and for a regional level in Jordan but yeah, I didn't work with them very much in Bangladesh, I didn't work with them very much in any other country. I worked, sorry I was in the cholera task force in Sudan, but yeah.*

I: Oh, I see. Okay, so, I guess, how - do you think that the coordination efforts between organizations that you coordinate with or the mentioned organizations could be optimized in any way? Is there some, is there overlap in responsibilities that's seemingly inefficient - yeah, if you could speak to that a little bit.

P: *I just realized that I forgot - I didn't answer your second question. Could you rephrase that?*

I: So that, yeah, how does - I guess I know that the JMP is an effort between UNICEF and WHO but I'm not sure if you all have overlapping roles.

P: No, no, it's very clear. So maybe it's best to say that there are designated staff members in WHO and designated staff members in UNICEF who are responsible - who have key roles in the JMP.

I: Okay.

P: So as far as I'm aware, we have two people in our office. I'm not sure whether we have more people in our office in Geneva. And then the JMP team, sorry the WHO team. They also have dedicated technical staff on the JMP, and there's three areas as you know, there's a household, there's a WASH in schools and healthcare facilities. So, there isn't a JMP office, or there isn't a - I mean, it's like a cluster as I mentioned, the customer doesn't exist. It's basically agencies put things together to make sure that the collaborative work between them results in things and that's the JMP reports, but because it's funded by the two agencies, which is WHO and UNICEF. So and I'm sure that they have meetings and discussions and there's a lot of technical discussions, but that's how they work so far so they jointly divide the work. I'm not sure how it's divided. I just know that if I had any question, I have never managed to go down to the - to our JMP staff and ask them questions that they haven't been able to answer because they're just so super brilliant people. And so we're very lucky to have them. And I also know the person who is now working in WHO used to work for UNICEF so there is a very smooth transition. Yeah, yeah. I mean, so I mean that's - there's often a lot of people who jump from one agency to another, but there's a very positive relationship, as far as I'm aware at the JMP. To go back to your other question about the coordination between agencies. I think this is where the cluster comes in. The cluster I think was brought in - the cluster concept or the sector coordination concept was brought in in about 2005 or 2006 I think, I can't remember. I just remember that that was a huge change. And this is where UNICEF where they try to basically instill standards. I mean, started with the whole SPHERE project at minimum standards in humanitarian situations. But then we tried to improve the whole coordination. Like, exactly as you mentioned, how do you stop the duplication of efforts? But importantly, as I mentioned, like, what happened when I was in Sudan, how do you stop five agencies running and falling over each other in one camp? When actually, the problems are outside of the camp. And often what we found was when we asked the question, they would say, well, our donors wanted to give us funding for this camp. And so that goes back to the question about the flexibility of donors to make sure that - I think it's also going back to NGOs ensuring that when they write proposals for funds, that they're flexible in their geographical area and not so restrictive. So when I started in Jordan at the very start, we had issues with certain partners. With some areas of overlap, so UNICEF - so what we tried to do was reduce that. Make it clear who's responsible for what. We did - in one camp we had a geographical allocation where certain partners were given certain numbers of districts to make it a bit clearer, while others had overarching responsibility for water delivery for the whole camp, for example. And in others we just had, okay, so this partner is responsible for sanitation, this partner is responsible for water distribution network to try to make it cleaner, but there was a lot of resistance. And it wasn't very easy, because, you know, people had figured, well, I have my funding for this. And I told my donor, I'm going to be doing this, so it wasn't so easy. So it's not I mean, often I find and perhaps this is not - it is a bit sensitive. I guess it's known, but still, it's not a very nice thing to say, but often it's down to the personality of the people involved. If you have a really good coordinator, things work, people will really want to support it to make sure it works. People will do a lot more than they would normally and people will be a lot more open to new things and it'll work. I've seen places where you have a really good coordinator. And things just are really smooth.

And everyone gets on. And there's a real focus on delivering things. And if there is an emergency, like Ebola or cholera, for example, people just come together and even better they have been prepared. So nothing's a shock. But often, sadly, that person moves on. And then another personality comes in and things change. And I don't think the cluster system has managed to get out of that. It's still very much personality focused. I mean, I think it's getting better in terms of capacity building. There's now more systems in place. So definitely the impact is less than it used to be, but it hasn't been negated completely. So yeah. So with the whole thing about, like the four W's or if you have a very good information manager, you can highlight this about where there's duplication and where there's still gaps and you can really push for it. And, and then it's also advocacy with donors who - we had that issue that we even went to a donor to say is there flexibility to get this partner to move in competition with the partner, of course, because if you know, we can't have three agencies doing hiring promotion in one small area, because it's just ridiculous, you know. The same three - the same household getting messages from multiple partners, you know. While UNICEF would coordinate messages to ensure that they were a standardized, we then we had that issue. So then we just basically then said, okay, we will have one partner doing hiring promotion. And then in the end, we then try to even streamline the number of partners because we shouldn't even be having three partners in a moderately sized camp. You know, how do you make sure it's fair, you know, because then you're paying for the support costs for three partners instead. So, I mean, these things are easier once the emergency has died down. But at the start often in your very helpful or grateful for what help you can get and often the numbers are much higher at the start, but doing that transition can be painful. Yeah.

I: Right. So I guess I have one last question to wrap up. It might be a complex question, but I guess, health organizations from the limited experience or limited exposure I've had to my research, they're increasingly recognizing the need to coordinate between sectors to achieve goals. And I'm wondering if - to what extent UNICEF is putting this recognition into action, for example, like specifically between health and civil engineering or you know. Yeah.

P: *Yeah. No, a lot actually. So I think that's one thing that I should have mentioned when you were asking about the things that have changed, I think there's definitely a lot more sector coordination. And this is where I think UNICEF comes in with many advantages because UNICEF works in education, child protection, health, nutrition, WASH, social protection as well. So this is, this is where it's really good when you're doing this situation analysis to look at all of this. So it's definitely getting a lot better. There's been a lot of good work. I think UNICEF has been doing some work on WASH and nutrition - how these are linked, and importantly, WASH and education. So this goes back to the impact of facilities having - WASH facilities in schools, the impact on attendance, performance, attention rates, etc. Enrollment, for example. So I think there's definitely a lot more coordination now. And with health, yes, in terms of drinking water standards, and now of course with COVID. WASH interactions with minimum standards for healthcare facilities for sure. Yeah, it's definitely growing. But again, I think sadly, and it can come down to the personality of the WASH chief with the health chief in a different country, if they - and in most cases for sure, they will get on really well. And with health and with the education chief. Yes, I think UNICEF even has some programs where - so UNICEF has different approaches in different countries. Often it'll focus on geographical areas, and it'll have a combined vulnerability approach. So therefore, all services from UNICEF or all support will be focused in certain geographical areas to have*

maximum impact. But in some other countries, like maybe the WASH issues are very different elsewhere compared to somewhere else. Like, for example, UNICEF has not historically really been involved in WASH infrastructure in urban areas, in rural for sure. But we may be working in child protection and education in urban, but not necessarily WASH, but historically, we're getting more into urban WASH, which is a huge area in itself. And that requires a lot of coordination with others. It's also just in terms of - this is where working with the social protection colleagues in terms of highlighting the vulnerability. How do you flag areas which are really vulnerable? You know, not just - this is where some analysis that we did in South Africa to reflect the inequalities of WASH access. It's really striking how you looked at the differences in standards across the various provinces. Really really striking. Just in terms of the types of WASH facilities people had, how long they had to wait, how often was a service interruption, so we were involved in doing an advocacy piece, and it was about children's health, but obviously WASH was included. And so that was really good. So I worked with the WASH chief in our office in South Africa to help develop this piece. So yeah, it is there, it could be stronger for sure. It could be more consistent in different country offices, but it's definitely coming together. And a signal of that now is that UNICEF has developed, as I mentioned, with our strategic plan, UNICEF has a goal area for - which basically looks at, you know, different aspects of a child's ability to live in a safe and clean environment. And what does that mean? And how do these all come together? So we try to do reporting, in terms of urban in terms of climate in terms of WASH all under this theme as well.

I: Okay, great. Yeah. And just out of curiosity, I wonder, with all of these issues coming up with water access and the hardship of like effective hygiene with COVID. I wonder if there's going to be any more permanent, I don't know, I guess more permanent strategies?

P: *Well, what we're doing now is where we're working with our education section. So to complement what you've just mentioned about intersectoral coordination. We're trying to basically say, what are the minimum standards or the minimum asks for schools to reopen? Which means that they have access minimum standards for access to wash and toilets, for example, and hand washing facilities. So this is exactly going back to this. So on the permanent thing, I would hope that people are aware of - I think it's just focusing that people are now aware of hygiene and contamination, and hand washing and the importance of this. So I would hope that I mean, and then - it's up to us I think to highlight the link with sustainable access to safe water. That you can't have, you know, a COVID response or you can't have - you can't avoid a public health situation if you have no access to water. And whether it's that there's also this is related to cholera - ineffectual treatment of wastewater, open defecation, management of waste, for example. Safe treatment of water. It goes back to cholera as well. Yeah. Yeah. I mean, at least I mean, not at least, but with cholera, it's tangible through water or through feces, etc. But with COVID, it's through the air. So it's also been - okay, it's through the air, but then you also can protect yourself in terms of handwashing. So I think it's really up to us to ensure that that message gets perpetuated and it continues and that narrative continues. And also it's a good time to highlight the gaps where there are currently and how these need to be addressed. But then again, you have the large scale, for example, like India. You know, you have people who are, you know, there's now hunger issues because people aren't working and they're missing out on the harvest. So that's what's coming next as well, you know?*

I: Yeah. Um, well, I think that's all I have today. I really appreciate all of the information you gave very willingly. I really appreciate that. It's kind of mind blowing how much value this will put into my thesis.

P: *No, great. No, I think it's fantastic. But please - with my two colleagues, I've been pushing them but if they still don't give you - I mean, really, it's bordering now on the unacceptable because it's, I mean, as intense as it is, it's lighter now than it was three or four weeks ago. So if they don't commit to a date and the time next week, please let me know and I will phone them up personally.*

I: Thank you so much.

P: *It's not, it's not - really it's not acceptable. I mean, I've shared this with our - with the head of our team Sylvia, she has suggested that Irene and Amelia need to talk to you rather than me, because the focus was on health, I said, fine. So it's good that you also reach out. But these two work with WHO, they work in health. It's their - I mean, and Amelia has a lot of good experience in terms of health programs in a country office. So she is, so you need to make sure that they respond to you. And if they don't, please do not hesitate to let me know.*

I: Yeah, I will, thank you. Irene and I have had some interaction, but we haven't scheduled anything yet.

P: *Yeah, but make sure Amelia is on the call - Irene doesn't have - she has a lot of interactions with the WHO at the global level, and she has done some things and she can give you some information on what's happening in country offices. But Amelia has hands-on practical experience of health programs. So also, as far as I know, has worked on Ebola as well. So I mean, for me, the two of them together would offer some really good advice. So definitely let me know.*

I: Yeah, I will, I will definitely keep you in the loop. And I'll have any I might have some follow up questions for you. But for clarity, when I transcribe everything, so I'll definitely be in touch. Yeah.

P: *Okay. I hope it doesn't take too long to transcribe.*

I: Oh, no, it'll be fine. I have plenty of time.

P: *Yeah, sure. Exactly. You're not gonna be going walking along any mountains soon. Ok well, stay safe and stay sane. I really enjoyed the chat. So if you absolutely don't hesitate, get in touch if you have any more questions.*

I: Yes. Yeah. And stay healthy for you as well. I hope things keep on the up and up over there.

P: *Yeah, definitely. Yeah, sure. Okay, thanks much Cecilia. Okay, bye bye.*

I: Bye.

INTRODUCTORY INFORMATION

Interviewer: Cecilia Welch

Participant: Tom Slaymaker, UNICEF/JMP

Date: 5/28/2020

Time Started: 8:22 AM

Time Ended: 9:09 AM

I: Interviewer

P: Participant

TRANSCRIPT

I: Okay, so I'm a master's student in global health. My thesis committee chair is Jessica Kaminski. And it's - it's also chaired by Johnny Crocker and Kenneth Sherr. And I'm asking you to participate in an interview as a key informant. You can ask questions about the purpose of the project, the questions, I'll be asking you the possible risks and benefits, your rights as a participant and anything else about the project that's not clear. And when I have answered all of your questions, you can decide if you want to participate or not. So the goal of the project - you may already know - is to investigate the extent to which large health organizations such as UNICEF, WHO, World Bank, although not really a health organization, and JMP, invest in development of infrastructure, or assist with that, specific to WASH. And through this investigation, I hope to further understand how health organizations function and their defined roles with regards to WASH infrastructure. And I'm using interviews to supplement the data analysis I've already been conducting on publicly available strategy documents published by these organizations and the interview should serve as more insightful and specific information behind the documents that are available publicly. And so in this project, I'm in the process of interviewing several key informants. And I will be analyzing the interviews to include in results and interpretation, hopefully to contribute to a manuscript for dissemination to academic journals. And if you agree to be in the study, I'll ask you questions about your role in the organization, the organization's role in WASH infrastructure and the organization's interaction with other organizations. It should take about an hour. Again, I really appreciate your participation. Sharing your experience will help us, my team better understand the project goals. And while there is no direct or immediate benefit to you as a participant, the research will help me in completing my thesis and help interested parties further understand project goals as well. And so my questions are not intended to do any harm to you as a participant, but should you feel a need to decline to answer any questions or stop the interview at any time please feel free to do so. And during the interview, I will record and write notes about the information you tell me and this information will be used in my analysis. I'll transcribe my notes and recordings and put together the information from all the interviews. When I have put all the information together, I'll write up the results and interpretation that will be presented in my thesis defense and disseminated to academic journals. I may quote statements that you make in the interview, but I will not include your name or other identifying information. However, despite these steps to protect your identity, it might be possible for people who know you to identify you based on your responses or other details that you share. Again, it's - this is voluntary participation, you can decline to answer anything, or stop the interview. There's no

penalties. And if there's anything that you want me to clarify, or if you have any questions after the interview, please just contact me. So I guess, since I've already gotten verbal consent for you, from you to record, do you agree to participate in this interview?

P: Yeah, that sounds fine.

I: Great. Okay, so let's get started. Please state your name and position you hold at UNICEF or JMP.

P: I'm Tom Slaymaker and co-lead the JMP. So I'm a senior statistics and monitoring specialist in the data and analytics section at UNICEF headquarters in New York.

I: Okay, great. And how would you describe the role that your organization, specifically JMP, plays in informing water sanitation and hygiene infrastructure? Especially in relation to health - like health facilities and communities, things like that?

P: Okay, well the JMP, as you probably know, is joint between WHO and UNICEF. So when I say my organization, I think it's probably more UNICEF because JMP is not an organization per se. But I think the reason that WHO and UNICEF formed the joint monitoring program is because of a shared interest in the importance of water and sanitation, and hygiene. Obviously, from the WHO's point of view, it is about health in its most general sense, but from UNICEF's point of view, it is about primarily maternal and child health. And the reason that UNICEF is the lead UN agency on the implementation of programs around water sanitation and hygiene is because inadequate WASH services are, have been, remain among the leading causes of deaths and diseases amongst, amongst children and adolescents. So there's a strong mandate, which explains why we work on WASH given its importance for children. But in terms of the way in which we work on it, the JMP is quite well established, it's been around since 1990. Started off monitoring WASH at the household level and more recently has started monitoring WASH in schools and in healthcare facilities. And I think we have a, a normative role in the sense that we are involved in developing guidance on what to measure and monitor and benchmarking progress that is made across countries and over time. And so, the role is really about setting international standards and monitoring progress that different countries are making towards meeting them in different settings. And although the JMP has existed since 1990, in 2000 it was mandated with monitoring the MDGs and in 2015, it was mandated with monitoring the new set of global development targets which are called the Sustainable Development Goals. And so, we also have this sort of official role when it comes to reporting to UN member states on the progress which has or has not been made towards global targets.

I: Okay, great. And so building on that, how do you say that your organization, or that JMP's role is changing with regards to informing WASH infrastructure development? For example, is your data collection or your indicator selection shifting from a strong health focus to using indicators that include other sectors besides health?

P: Yes, I think the evolution of national and global monitoring of WASH reflects you know, a number of different things. I think that health has been a major focus throughout. So the old indicators that were used in the MDG period focused primarily on the type of infrastructure that people use and whether or

not it was improved. And the definition of improved is essentially based on the likelihood of water sources delivering water that's safe to drink, and the likelihood of sanitation facilities hygienically separating excreta from human contact. And so, and health was a key part of that definition. But since then, as we've shifted towards monitoring the SDGs, the indicators have become more sophisticated and they have moved beyond measuring whether or not people have certain types of infrastructure towards looking at the, at the level of service that people receive. So for example, we're looking at things like drinking water quality, accessibility and availability and we're looking not just at whether or not people have a basic toilet, but we're looking at what happens to the waste that's produced and whether that is safely treated and disposed of. We're also moving beyond household level, I'm looking at schools and health care facilities and there you have a sort of a mix of indicators that are focused on simply infrastructure and other aspects to do with behaviors and processes that are in place to manage infrastructure. And so, you do see this evolution but the foundations of monitoring are still focused on whether or not basic infrastructure is in place. I think the other major influence is on - is derived from the discussions that have been going on around the human rights to safe water and sanitation. And although there was a general comment in 2002, I think it was only really around 2010. And the independent expert who then became a special rapporteur elaborated the normative criteria of the human rights to water and sanitation and there, they go far beyond health. So it's looking not just at health, but well being, issues of dignity, issues of non-discrimination, stigma, many other things. So, we have always used the human rights to safe water and sanitation as a, as a reference point, as a starting point when designing indicators for global monitoring. And for that reason, our indicators are starting to go beyond just a very narrow focus on health to start to take into account these broader issues to do with convenience, acceptability, dignity, availability, and so on.

I: Okay, yeah. Interesting. Do you think - so I realized that the pandemic is probably influencing a lot of aspects of your work right now - but before this happened, do you think there were important factors that you were - that you wanted to consider moving forward that influenced shifts in your strategy or I mean, maybe you could definitely speak to COVID as well. I'm totally open to that. But yeah, I guess, I guess how do you see the future of JMP?

P: Well, I think there are a number of things that sort of influence our thinking. As I mentioned before, we recently adopted a new framework for SDG monitoring. So the SDGs were brought in in 2015. And they run through till 2030. Next year 2021, we will be approaching the midpoint. And so I think there will be a review of the progress that's been made in terms of monitoring water, sanitation and hygiene and things that are missing, things that need to be done better, things that need to be added to the global monitoring framework in the future. I think the pandemic has really just been underlying the importance of monitoring. You know, the JMP for years and years and years has been drawing attention to the lack of robust data on water, sanitation, and hygiene. And when you do have data, they're very low levels of service in many countries around the world and in particular the inequalities in service levels, between countries and also within countries. So the fact that people are suddenly showing an interest in hygiene, I guess, is a good thing. And there's an opportunity there for us to build on that and to take the opportunity to strengthen national monitoring systems. And perhaps to expand them to address, you know, a wider range of issues. I think the framework we have for monitoring households is already quite

well established. And we're making good progress in terms of collecting the information we need for the majority of countries around the world. I think the framework we have for schools and for healthcare facilities is still in its early stages. And so there are many countries that still don't have basic information. So there's a lot of work to do to fill those data gaps before we start to think about adding additional indicators. But what we might do I think, is consider whether we want to expand to address different settings. So for example, looking at workplaces or prisons or refugee camps or other settings which we know tend to have quite different levels of service. And there is also a question about whether we should expand and start to address issues to do with affordability. And that's something that we're currently doing some work on. But it remains unclear exactly how that could be measured and monitored in a meaningful way across, across countries. So there are, you know, some new areas of work emerging, which are interesting. But what we have tried to do is to focus on the small number of things which we think are universally important. And we've documented those in our, in what we call our core questions. And then we have an expanded list of what you might call advanced questions, which could be considered and could be measured and monitored in those contexts where there are additional resources or there's a strong interest to go further and measure more things. And potentially there is, you know, huge potential to do a lot more when it comes to measuring and monitoring and hygiene, and the links with infection prevention and control. And also, you know, public health, links to mass behavior change and so on. So there are lots of areas where I can imagine us doing more work in the future. I think the question is whether we will do those sooner as a result of the pandemic or whether they will simply be integrated into the thinking on the framework that will be put in place to follow the SDGs in 2030. And, of course, there will be a new framework, there'll be new targets, and there'll be a big discussion about, you know, what else should be included above and beyond the things that we're able to measure and monitor at the moment.

I: Great. So you alluded to data gaps, and that being a hindrance to your work. Do you - is that something you consider to be the most challenging aspect of, you know, being able to produce reliable information?

P: Yes, it's a major, it's a major consideration for us, is simply the availability of data. If we don't have nationally representative data, then it's very difficult for us to produce estimates, and if we can't produce any estimates at all then we can't compare progress with other countries. So we do do a lot of work to support member states to address those data gaps. We hold a lot of workshops, sometimes regional workshops, and sometimes at the country level. We work through our country offices who are involved in trying to strengthen national monitoring systems and to integrate, you know, the latest recommended core questions and indicators if they're not already being measured and monitored. So, yes, there's been a big push I think, since the adoption of the SDGs to address some of some of the data gaps and to ensure that more countries are able to measure and monitor them. I think the other aspect is, is to do with data quality. So, we find that in some countries, there is a very robust system in place to collect this information and, you know, the definitions are, are clear, and the questions and indicators are collected in a standardized manner. But in other countries, that's not the case. And so there's, the level of confidence that we have in the data that is produced varies, it varies between surveys. It varies between between surveys in the same country, but also across countries. And so that's also something that we, we work on and you know, we try to consult with countries in order to figure out what is the

best available data for that country. And to try to take that into account when we are calculating our estimates.

I: Do you, do any other other challenges come to mind with - that also hinder your work?

P: Um, well one, I think is the ability of national authorities to invest in, in data. I think in some countries there is a strong culture of monitoring and surveillance and there is a high value placed on independently collected data, rigorous data collection, which can then be used to inform decision making, whether that's at the local level or at the national level. But yeah, that varies and so in some countries we're able to find this information online, it's, it's published, it is available for anybody to access and to use for their own decision making are in order to try and influence the decisions, the decisions made by governments. But in other countries, you know, information is not readily available. We know it's been collected, but it's not published and therefore, we have to try to persuade national authorities to share it with us. So that we can use it to compare progress with, with other countries. And so the degree of openness and transparency is important, as well as the sort of degree of independence of national statistical offices vis a vis various ministries. But we will always aim to consult with national statistical offices about the data available, the quality of the data and whether we have correctly interpreted it. But in some cases, national system offices enjoy a high degree of autonomy, but in other cases not so well resourced and we end up with, you know, different data being produced by other parts of government, which makes it then difficult to determine, you know which data sources can and should be used as official statistics.

I: Do you have any specific examples you'd be willing to share like reflecting this high value and in lower value with data.

P: I think it's partly just reflected in the availability of data. So, you will find some countries wherever, you know, regular household surveys and censuses, which includes good information where you have a well functioning education management information system and you have some sort of health monitoring system. And so, you know, those are the countries where I think you can say with some confidence that there is a, you know, well established culture of collecting information and publishing it and reviewing it. And, of course, there are other countries where it's very difficult to find any, any published information. So, I think, you know, those are, those are general examples. I wouldn't want to sort of single out individual countries as being particularly good or particularly bad. I think that's not really appropriate, I just think it's important to recognize that different countries have different levels of capacity, but also different willingness to collect and publish information in the public domain.

I: Great, thank you for that. So moving on to some, like coordination efforts between agencies. I'm curious how you perceive the efficiency between coordination efforts from the perspective of your position. Do you think that there any ways that it can be - that can be optimized? Yeah, I guess we can start with that.

P: Um, well, so in terms of global monitoring of the SDGs there's a very large number of SDG goals and targets. I think there are 17 goals and 169 targets. And for each of those targets and indicators there is

an agency that is appointed is known as the sort of global data custodian. So the JMP/WHO, UNICEF/JMP are custodians for SDG 6.1 and 6.2 and caters for those targets. But, of course, there are many others out there. So I think the coordination with WHO under the Joint Monitoring Program is, is extremely good. And in many ways is an example for others to follow in terms of working very closely together, very efficiently to collect information, collect and compile information, and, you know, support countries to strengthen their monitoring systems. But we are just one small part of the ecosystem of agencies working on the SDGs. So there is another group which has been established recently to coordinate global monitoring activities under SDG 6. So this goes beyond WASH and includes things like water for ecosystems, water management of wastewater. And there's something called the Integrated Monitoring Initiative for SDG 6, which brings all of the custodian agencies for SDG 6 together around the table to talk about, firstly, you know, the work that they're doing, and lessons from, from that work, but also to try and establish links, either in terms of the methodologies that are used or to actually combine the data in new and interesting ways. And also to coordinate the process of collecting and compiling data and consulting with, with member states. So I think that's a big step forward. There was, there was nothing like that under the MDGs. But it reflects the growing complexity of the SDG agenda. And so yeah, there is, you know, some reasonable coordination now within SDG 6. But I think there are still some challenges about how the different international agencies work together especially at a country level. There is this idea of, you know, one UN where the, the various UN agencies you know, in a sort of coordinated manner. But the reality is that, you know, no, no one agency can have, you know, technical expertise in, in all aspects of the SDGs. And so, the question is, how do we, you know, share that expertise and how do we call down the type, you know, the type of support that individual countries need in specific technical areas, when it comes to measurement and monitoring. And that's still an ongoing discussion about the best way in which to coordinate our various capacity building efforts. But certainly at the global level, I think coordination, at least within aSDG 6 is pretty good. And certainly on WASH and within the JMP, it's excellent and that's partly because the JMP has been around for some time, it's well established. And so we've had a lot more experience of doing this than some of the other monitoring programs, which have already been established in the last couple of years, since new targets or indicators have been established for their area of expertise.

I: Okay, great. I'm just curious about how the pandemic has influenced your work immediately. I may or may not include this. This is just purely out of my own curiosity. But I was, you know, speaking with UNICEF, with Fiona at UNICEF and she, she was talking about how there's this like, increased recognition, all of a sudden that good hygiene cannot be practiced in certain areas because of water scarcity issues. And just aspects of that, of access is resonating with a lot more people now and I think that maybe that's something that could be driving changes and strategies for some organizations or agencies that maybe previously had not prioritized that as much or recognize the connection as much. But yeah, I guess that, in general, how do you think that, how is the pandemic changing your work immediately? Or how do you think it's going to influence the future?

P: Well, in the short term, I think the positives have been an increased demand for information on status and trends in, in hygiene particularly. Whereas previously, there was very little interest. Now I think people have realized that it's very important for preventing infection and reducing the spread. And so, yeah, I think that's a positive thing. So we've been, you know, trying to develop guidance materials for

decision makers on which countries currently have data and amongst those, you know, which ones have the lowest levels of hygiene and hand washing facilities in households, schools and healthcare facilities. So in order to identify those countries and regions of the world where it will be most difficult to implement the sorts of measures that are being recommended whether it's, you know, frequent and proper hand washing or whether it's staying at home. And, if you don't have water on premises, or if you share sanitation facilities with another household, then it's very difficult for you to stay at home. So we've been emphasizing that using our data to highlight those, those countries and those populations who are likely to be - least likely to be able to cope and respond. And then I suppose the second level of response is to highlight the data gaps and say, well, there are still many populations for which we have no data at all and we suspect that they also have quite significant problems, and to advocate for a big push to collect information on those, on those populations. And one of the challenges, though, is that although there's an interest, currently, also the activities are on hold. And so because of the lockdown, there are no household surveys going into the field or no censuses happening this year, there are no surveys of schools and health care facilities planned. And so there's a, you know, a bit of a Catch 22 whereas there's suddenly an interest to collect more and better data, but it's currently impossible to do that. The trick will be to maintain interest in momentum which has been generated in response to the pandemic. Once the lockdown is lifted and it starts to become possible to collect data again and then to try and ensure that the countries that don't have data, do do comprehensive baselines of current situation and also ideally set targets for improvement and a system for tracking progress towards this target. There is now a discussion about establishing a global initiative to scale up hand hygiene, which would bring together not just WHO and UNICEF but other stakeholders, private sector, civil society, to have a big push on improving hygiene, generally. But specifically in homes, in schools and in healthcare facilities. So, yeah, if that takes off and it gains political traction, then it could lead to a longer term improvement in the situation. On the downside, of course, if the lockdown continues for a very long period and there's a big economic recession, then we may actually see service levels disrupted in the, in the short term and deteriorating in the long term, and that's one of the great unknowns, is whether, you know, as we've seen with previous economic recessions, the existing water and sanitation service levels have gradually deteriorated, or they have stagnated, or rates of progress have slowed because of lack of investment, lack of finance. And so, yeah, it's, it's difficult to say whether there will be a drop in service levels or whether they will just remain the same or in fact, in some cases, there may, there may be an improvement, recognizing the importance of, of these services which have previously been neglected.

I: And so you've talked about the advocacy role that you take versus the data collection and monitoring and analysis side of things. Is that - do you see those two things as separate roles and that your team does? Or is that something that is the advocacy role, something that you've always done or? Yeah, could you just elaborate on that part?

P: Yeah well, I think our role as the JMP is to try and produce reliable, internationally comparable statistics. And those statistics are then used by the sector as a whole, to advocate for increased investment or better targeted investment, focused on those countries and populations with the greatest needs. And so, I think, you know, we advocate for more and better data. Whereas, UNICEF, UNICEF programs division and WHO programs, and the various big NGOs and private sector organizations that are active in the sector will be advocating more for investment. So, you know, where we are involved in

advocating for better monitoring. But the question, what does that data tell you and how does it inform what you ask for, at a regional level or - sorry at a global level or at a country level, will vary quite, quite widely. So I think in some cases, the focus is simply on extending basic services to populations that that don't yet have anything. And in other cases, it's about keeping existing services running and trying to progressively improve the quality of services that people have. And so that, you know, the balance among those advocacy objectives will vary according to the call. And our job is just to put that, put the data out there and you know, invite governments and donor organizations to reflect on what it tells us about whether or not we're making progress and where to target their efforts to improve the situation.

I: Um great. I actually don't have any more questions. But if there's anything else that you want to talk or want to add that I should, that we haven't touched on before. Yeah. Is there anything else you'd like to add?

P: Well, I think you're, I mean your questions are all good. And I think it's an interesting topic. I think if you're, if you're coming from a health perspective or a health background, I think it is interesting for you to reflect on the fact that under the current global monitoring framework, water, sanitation and hygiene are under a goal which is dedicated to water and sanitation. They're not under a health goal. And I think that is a deliberate framing. And there are lots of positive things about that, which we've touched on. But it is, it is also a risk in the sense that, you know, you don't find that water and sanitation issues are always being reflected in the policies and programs which are being adopted by health sector agencies. And so I think that will be worth exploring with some of your other key stakeholders, this might be something that's worth talking to, WHO and others knows about. So people who, you know, care about water, sanitation and hygiene, that work in health sector organizations might have a slightly different view. And this is something that we've come up against with WASH in healthcare facilities, where in many countries, there is, not disagreement, but there is not yet clarity on the roles and responsibilities of different sectoral agencies in terms of improving the situation. So is this something that's led by the health sector? Or is it something that's led by that water and sanitation sector? Or some sort of combination? So I think that's something that you might want to think about. There's no, you know, universal blueprint that works in all countries, but it is something to think about and I think it is one of the constraints that has resulted from this particular framing where water and sanitation are increasingly seen as an environmental issue rather than fundamentally a health issue. And it may well explain, the fact that in response to this pandemic, many people, certainly the public, many politicians have failed to recognize the fundamental importance of WASH as a, as a foundation for public health.

I: Mm hmm. Yeah, that's very interesting. Do you do you think this has been a trend over time that's gotten a little bit? Hmm. Do you think there's more disparity between the two or do you think it's a little bit more coordinated now?

P: Well, if you look back the MDGs were essentially about development. Human development. Economic development. Whereas the SDGs are trying to bring together social and economic development with the environment. And so as you merge those two, three things you have to take, make decisions about where to put things. Is WASH going to be seen as a driver of health or is it going to be seen as an

environmental issue? Or both? And it's not necessarily an either or, but I think the framing is important in terms of the way in which people think about things. And also in terms of the political priority that the issue receives.

I think, in many low and middle income countries, WASH is quite rightly seen as fundamentally important for health and it just happens to be under an environmental goal. But in the higher income countries, I think it is increasingly as environmental issue. Depending on the relative priority that's given to environmental issues in those countries, then that could be a good thing or a bad thing.

I: Okay. Yeah, that's definitely - I'll definitely incorporate more of that into my interviews with, with WHO and perhaps others with UNICEF. Yeah, it'd be interesting to hear what they have to say, especially if they work in health first. Yeah. Well, thank you so much. I do you have any other questions for me or any other comments?

P: No, I don't think so. I hope I've answered most of your questions.

I: Yeah everything you said is very interesting and will be really useful. Yeah, again, thank you so much. It's a really busy time and I really appreciate it.

P: No that's okay, and good luck with your thesis.

I: Thank you so much. Thanks.

P: Nice to talk to you.

I: You too, bye.

P: Bye bye.