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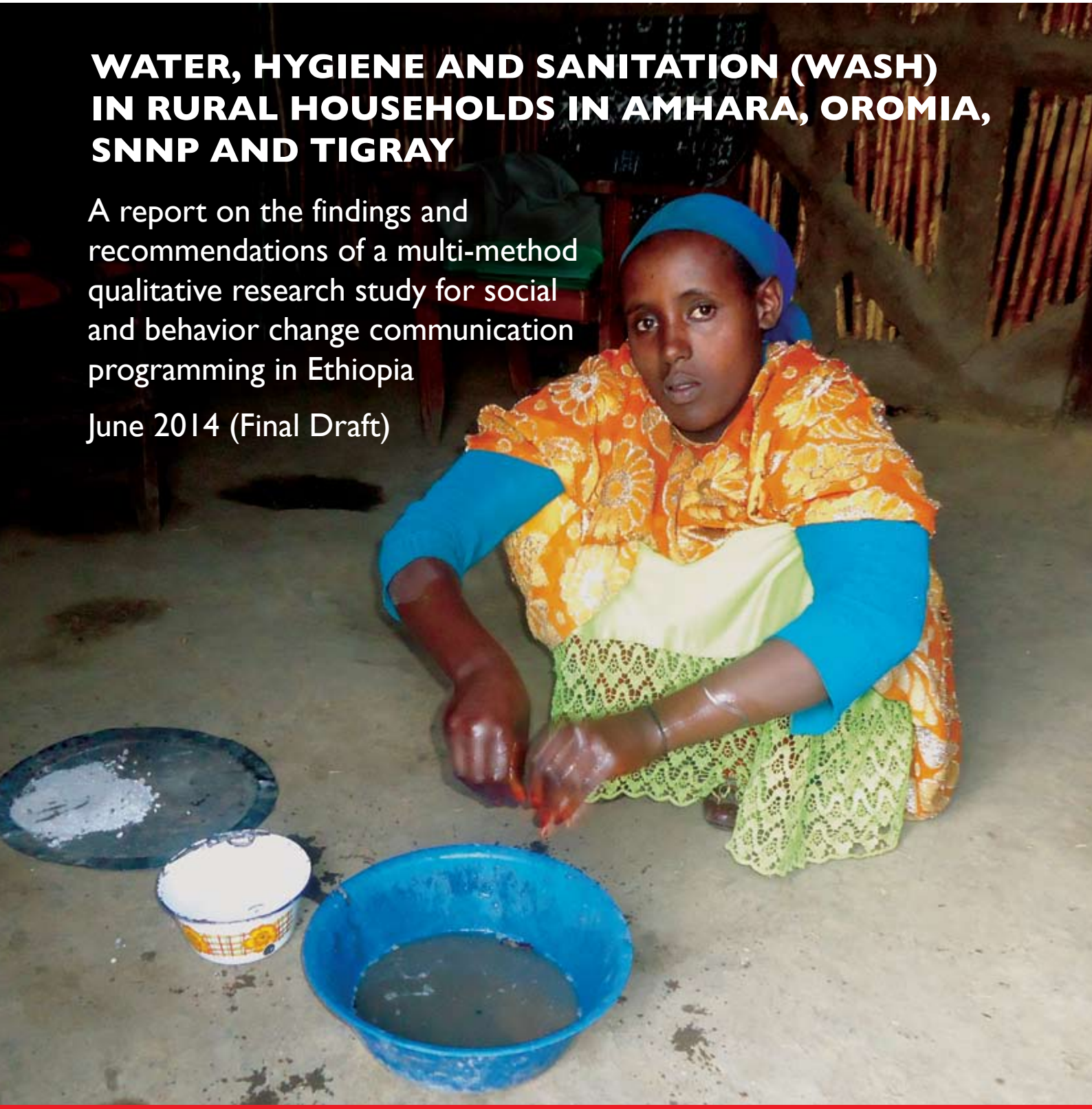
WATER, HYGIENE AND SANITATION (WASH) IN RURAL HOUSEHOLDS IN AMHARA, OROMIA, SNNP AND TIGRAY

A report on the findings and recommendations of a multi-method qualitative research study for social and behavior change communication programming in Ethiopia

June 2014 (Final Draft)



ENGINE: Empowering New Generations to Improve Nutrition and Economic opportunities
A project supported by the Feed the Future and Global Health Initiatives

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THE MANOFF GROUP

Water, Hygiene and Sanitation (WASH) Practices in Rural Households in Amhara, Oromia, SNNP and Tigray Regions.

A Report on Findings and Recommendations from a Multi-Method Qualitative Research Study for Social and Behavior Change Communication Programming in Ethiopia

June 30 2014 (Final Draft).

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Empowering New Generations to Improve Nutrition and Economic opportunities (ENGINE) is a five-year USAID-funded multi-sector nutrition project whose goal is to improve the nutritional status of women, infants and young children through sustainable, comprehensive, coordinated, and evidence-based interventions, enabling them to lead healthier and more productive lives. In its support of the National Nutrition Program, ENGINE's mandate includes a robust learning agenda and innovations in implementation that contribute to large-scale, evidence-based social and behavior change communication (SBCC) for nutrition.

ENGINE is implemented under the leadership of Save the Children, with cooperation from Tufts University, Land O'Lakes, Valid International, JHPIEGO and The Manoff Group.

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This study was designed by Dr. Laurie Krieger, Senior Advisor, Health and Social Science, of The Manoff Group, in collaboration with Ms. Lutz and Dr. Lydia Clemmons, Senior Advisor, Social and Behavior Change Communications, of The Manoff Group. The data were primarily analyzed by Dr. Krieger, with support from Dr. Andrew Carlson and Dr. Clemmons. This report was written by Laurie Krieger and Lydia Clemmons.

Acronyms

AEW	Agriculture Extension Worker
AOR	Agreement Officer's Representative
ANC	Antenatal Care
DHS	Demographic and Health Survey
ECC	Enhanced Community Conversation
ENGINE	Empowering New Generations to Improve Nutrition and Economic opportunities
HEW	Health Extension Worker
HIP	USAID Hygiene Improvement Project
IYCF	Infant and Young Child Feeding
PCV	Peace Corps Volunteer
SBCC	Social and Behavior Change Communication
SNNPR	Southern Nations, Nationalities, and Peoples' Region
USAID	United States Agency for International Development
WASH	Water, Hygiene and Sanitation
WHO	World Health Organization

1. Background

ENGINE

Empowering New Generations to Improve Nutrition and Economic opportunities (ENGINE) is a five-year (2011-2016) multi-sector nutrition project funded by the United States Agency for International Development (USAID) through the Feed The Future and Global Health Initiatives and led by Save the Children. The program's overall objective is to improve the nutritional status of women and young children in Ethiopia through sustainable, comprehensive, coordinated and evidence-based interventions, including social and behavior change communication (SBCC) programming. ENGINE works in 83 productive woredas covering four regions (Amhara, Oromia, SNNPR and Tigray) of Ethiopia and will expand to 17 additional woredas. The project focuses on the prevention of stunting during the first 1,000 days, starting from conception until the child is 24 months old, through an integrated package of evidence-based interventions including direct nutrition and nutrition-sensitive approaches (maternal, infant and young child nutrition, pre-service education, livelihood and economic strengthening and gender mainstreaming).

Links between fecal contamination, enteropathy and stunting

Recent research shows the devastating result of exposure to fecal contamination on chronic intestinal inflammation (enteropathy caused by the environment), reducing the gut's ability to absorb nutrients (Ricci, K., Girosi, F., Tarr, P. et al, 2006; Petri, W., Miller, M., Binder, H et al. 2008). The most direct pathways of fecal contamination for young children are through unwashed hands and the child being placed in contaminated areas where animal feces have passed.

Given the strong bidirectional relationship that exists between stunting and childhood illness, especially enteropathy, USAID has allocated approximately $1.3 million for ENGINE to integrate WASH into its comprehensive nutrition package starting from its third year of implementation.

ENGINE's WASH-specific objectives

ENGINE aims to reduce stunting through four WASH-specific objectives:

1. To facilitate an enabling WASH environment at the policy level;
2. To improve access to safe water and sanitation technologies and products;
3. To promote optimal WASH practices to reduce risk for diarrheal disease and enhance the ability of children to maintain essential nutrients; and
4. To document results and lessons-learned that contribute to the evidence base on simple doable actions to integrate WASH and nutrition programming.

WASH-related baseline study findings

Key findings from ENGINE's baseline study[1] on WASH practices are summarized below:

Access to improved sanitation facilities:

- Access to improved sanitation facilities is almost non-existent across the 42 woredas surveyed. At most 2 percent of households have access to an improved sanitation facility in

[1] ENGINE Impact Evaluation Study: Results of baseline Survey, Valid International (February 2014).

the surveyed woredas, much lower than the already very low national average of 8.3 percent.

Access to improved water sources:

- The 2011 Demographic Health Survey (DHS) has shown that more than fifty percent of households in Ethiopia had access to an improved water source (Central Statistics Agency et al. 2011). However, the ENGINE survey shows great variability with regard to this indicator across the woredas surveyed. Access to improved water source ranged from as low as twelve percent to as high as seventy-nine percent. Only 15 out of the 42 woredas surveyed had safe water coverage of fifty percent or more as reported in the national average.

Water collection times:

- Among the woredas surveyed, the proportion of households with water collection times of 30 minutes or less ranged from as low as 19% to as high as 93% with 33 of the 42 woredas having 50% of households able to collect water within 30 minutes.

Treating drinking water:

- The practice of treating drinking water at the household level is very low across all the woredas surveyed with the prevalence of the practice only going as high as 16% and with majority of the woredas (37 out of 42) with less than 5% using water treatment methods.

Sanitary disposal of children's feces:

- The sanitary disposal of children's feces varied from woreda to woreda ranging from as low as 4% to as high as 76% with only 13 of the 42 woredas having an estimate above 50%. Surveyed woredas in SNNPR generally had higher proportion of households that practice sanitary disposal of children's feces than the woredas in other regions.

In an effort to inform WASH/SBCC programming on the feasibility and desirability of improved practices, the USAID Hygiene Improvement Project (HIP)[2] undertook a formative research study of Trials of Improved Practices (TIPs)[3]. The sample of the HIP research study, however, was entirely urban or peri-urban, and the improved WASH practices explored were for families coping with at least one member with HIV, rather than a sample to investigate prevention of diarrhea in young children. Few other studies providing insights into WASH-related practices in rural Ethiopian households exist.

Overview of this study

The purpose of this research was therefore to provide qualitative information about current household water, sanitation and hygiene (WASH) practices to support the design of a social and behavior change program that helps to reduce the risk for enteropathy among children and thereby enhance their ability to maintain essential nutrients. The research focused on children between the ages of 6 and 24 months.

[2] The WASH Trials of Improved Practices (TIPs) was conducted in October 2008 for USAID's Hygiene Improvement Program (HIP).

[3] Trials of Improved Practices (TIPs) is a formative program/strategy development research technique developed by The Manoff Group in the 1970s and since adopted by many other organizations. The TIP researcher negotiates with TIP participants to try out new or modified practices that would improve their health or that of their children or other family members or would help them to better reach their fertility goals.

The study was designed to rapidly generate information to guide ENGINE's design and implementation of social and behavior change interventions promoting improved WASH practices in households and communities.

2. Methodology

2.1 Research objectives

The research objectives were to:

2.1.1 Record, using observation checklists and recording forms, interview schedules, and photographs or videos, the following household practices:

- Hand washing practices of caretakers/child feeders during critical times;
- Disposal of human and animal feces;
- Latrines and their use;
- Water collection, storage, and handling;
- Play areas and eating areas.

2.1.2 Document the exposure of children 6-24 months old to human and animal feces, and feces-contaminated food and water, including their exposure to flies.

2.1.3 Understand sanitation, water storage and use, and hygiene in the context of the daily lived experience of children's parents and/or caretakers; and

2.1.4 Support the identification of nutrition-sensitive strategies, including social and behavior change communication, to help break the most direct fecal contamination routes to young children.

2.2 Household practices researched

The research methods used to document the following WASH-related practices in the 24 households were:

- Handwashing practices, including during three critical times (1. after defecation or cleaning a child who has defecated; 2. before preparing food; 3. before eating or feeding a child).
- Disposal of feces of all family members and domestic animals
- Latrines and open defecation areas
- Areas where children play and eat
- Water collection, storage and handling
- Care and feeding hygiene for children

Appendix 1 provides additional details covered in each of these priority WASH-related behaviors and practices.

2.3 Research Teams

The qualitative study was conducted by 12 Peace Corps Volunteers (PCVs) and 12 ENGINE Zonal Coordinators (ZCs), paired together in twelve teams. They participated in an intensive three-day skills-based training on ethnographic methods and WASH, which included a pretest (trial run) of all of the research instruments in a community near the training venue. Following this pretest, the teams participated in improving and finalizing the instruments before traveling to their research sites to begin work.

The research teams had little to no prior experience in rapid qualitative research methodologies, particularly direct observations over extended periods to record families' daily routines. During the data collection, the PCVs (all of whom were US Americans) as well as the ZCs (all of whom were

Ethiopians) encountered WASH-related practices that surprised them because they were outside of their own daily observations while living in Ethiopia. Each research pair gained personal newfound knowledge and insights into these practices. **Appendix 2** summarizes the lessons learned by the research teams during their experience in conduct the qualitative research.

2.4 Site and household selection

The research was conducted in a total of 24 households located in twelve communities (two households per community) in Amhara, Oromia, SNNP, and Tigray regions. Communities were purposively selected based on proximity to the Peace Corps Volunteers' posts to lessen logistical and administrative constraints. Household selection was conducted by the research teams in collaboration with local (kebele) government officials; most often the HEW or AEW made the final selection of households, in collaboration with the research team. The research teams met with households ahead of time to agree upon the times for the observations and interviews.

Households were selected using the following criteria:

- Rural or semi-urban
- Economically typical of the area
- Has a child between 6 and 24 months old

2.5 Study participants

A total of 24 mothers and 24 fathers were interviewed. In addition, 12 of the mothers were shadowed and observed during a three-hour period before, during and after meal preparation. Twelve children between the ages of 6 and 24 months were shadowed and observed over a twelve-hour period. Table 1 below indicates the age and gender of the 12 shadowed children.

During the observations, research teams noted any actions of other family members and occasionally neighbors, who came into contact with the shadowed children.

Table 1. Research Teams, Research Sites, and Shadowed Children

Research Team	Research Site			Shadowed Child (Household #1)	
	Woreda	Zone	Region	Age (months)	Gender
1	Bure	W. Gojjam	Amhara	20	M
2	Dembecha	Gojjam	Amhara	14	F
3	Efrata Gidem	N. Shewa	Amhara	11	M
4	Lumame	Gojjam	Amhara	16	M
5	Woreta/Fogera	S. Gondar	Amhara	21	M
6	Sinana	Bale Robe	E. Oromia	8	M
7	Ambo	W. Shewa	W. Oromia	9	F
8	Gimbi	W. Welega	W. Oromia	15	F
9	Bolosse Soro	Waleyta	SNNPR	12	Data missing
10	Decha	Kafa	SNNPR	24	M
11	Dilla	Gedeo	SNNPR	24	F
12	Alamata	S. Tigray	Tigray	23	M

2.6 Research methods used in the study
The methodologies used in this study on WASH practices in the 24 households were:

Descriptive inventories
This method entailed listing in detail items found in the areas of the home and the compound where children spent their time, cooking areas, water storage areas, latrines or defecation spots, and hand washing areas. For the WASH Observation, not only items but also practices were observed. This was filled out for all households and might take several hours to fill out

12-hour direct observations (twelve households)
In half (12) of the households, children between the ages of 6 and 24 months were "shadowed" by following the child over a 12 hour period to observe everything that he/she did during nearly all of her/his waking hours, from the time the child woke up until the time the child went to sleep at night. This observation was usually broken up into two, six-hour observations, conducted over a two-day period. Observations included noting all instances of exposure or possible exposure to human or animal excrement. However, due to the schedules of families and abilities of the research teams to reach remote areas, not all teams were able to observe for the full 12 hours. Some teams observed for only 10 or 11 hours. Observations were guided by a checklist that included a timed observation of the "shadowed" child for two minutes while food was not being served and counting all the flies within three feet of the child. However, many teams limited themselves to flies on the child during the two minutes.

Research teams were encouraged to also keep detailed, timed observation notes, although this was not required. Many did so. These provided invaluable insights into how young children spend their days, how and where they play, etc.

3-hour direct observations of hand washing during food preparation (12 households)
In the other half (12) of the households, mothers of children 6-24 months old were "shadowed" over a 3 hour period and directly observed while preparing a meal.

This method entailed "shadowing" (following closely) a mother of a child 6-24 months old, beginning before she cooked the main meal until she served it to her family (especially the children) and filling out a simple handwashing behavior checklist.

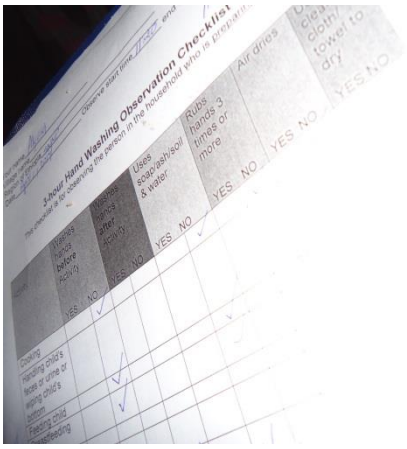


Photo: A 3-hour handwashing observation checklist

Additional field notes
Research teams were encouraged to submit their insights and additional relevant observations or conversations. Several teams chose to send a page or two of additional information.

Photos and/or mini-video recordings
Where possible, and with informed consent, the research teams took short video recordings of as a means of visually documenting what they observed.

Individual Interviews with children's mothers and fathers

Interviews centered on asking mothers and fathers about:

- their knowledge or awareness of public health recommendations for hand washing and managing feces;
- their hand washing practices, water sources, and water collection practices;
- how they spend their days;
- the presence of a latrine, and how it is used by family members;
- other defecation sites;
- awareness and perceptions of their children's contact with feces and whether or how they attempt to prevent it.

The research protocol and data collection instruments are attached in **Appendix 3.**

2.7 Procedure

Research teams were provided with formal letters of introduction from the local government authorities in the woredas where the research was conducted.

Research teams were trained to maintain confidentiality and to use an informed consent procedure. Teams explained the purpose of the research and assured that family members understood they had the right to refuse or to accept to participate. Consent forms were used for the research in general, as well as to specifically give or deny consent to take photos and videos. Teams also explained how the data would be used. Adults were given forms, which were read in local languages, and if they consented, were asked to sign their consent, and to also provide their informed consent for their minor children (under 18 years of age) to participate as well. Families were also advised of their right to withdraw from the study at any time without any bad consequences.

Each research team spent three days in one site, and conducted observations in two separate households. In one household, a child between the ages of 6 - 24 months old was shadowed for 12 hours. In the other household, a mother or grandmother of a child between the ages of 6-24 months old was shadowed for three hours. With the exception of shadowing children in half (12) of the households, and mothers or grandmothers in the other half (12) of the households, all other research methods were identical in all 24 households. In addition to the observations, teams completed descriptive inventories, and conducted interviews with mothers and fathers in each of the two households to which they were assigned.

In general, the Peace Corps Volunteer carried out the observations while the ENGINE Zonal Coordinator handled the interviews. They met at the end of each day to compare and complete notes and fill in the questionnaires electronically. Both researchers took photos.

An overview of the research methods, household practices, and specific issues addressed in this study is provided in Table 2 below.

Table 2. Overview of Research Methods, Household Practices, and Specific Issues Addressed

Household Practices / Research Methods	Hand washing Practices	Presence and Use of Latrines	Disposal of Human and Animal Feces	Play Areas/Eating Areas	Water Sources	Water Storage and Handling	Care and Feeding Hygiene for Children 6-24 months old
12-Hour Observations/Shadowing Child 6- 24 months old	X		X	X	X		X
3-Hour Handwashing Observations/Shadowing Caretaker	X						
Descriptive Inventories of Houses, Compounds and Latrines		X		X		X	
Photos and Video-Recordings	X	X	X	X		X	X
Individual Interviews with Fathers	X	X			X		
Individual Interviews with Mothers	X	X			X	X	X
Field Notes	X	X	X	X	X	X	X

2.8 Strengths and limitations of the research design

This study is based on a social-cultural anthropology approach that seeks to understand why people do what they do. The study uses standard ethnographic methodologies in anthropology that are qualitative in nature. The data collection instruments used by the research teams were designed to elicit what anthropologists call "thick description"–a careful, detailed and systematic documentation of not only people's WASH-related practices- but the physical and familial context, cultural models that shape people's values, ways of thinking, relationships and practices in their day-to-day lives.

The strength of this qualitative approach is primarily in the details, which offer greater insights into what happens within family homes and compounds, and, most importantly, ideas for innovative SBCC and WASH programming that contribute to improved practices and child nutrition outcomes.

The limitations of the research design are typical of those of most qualitative research studies: the sample size is small (24 households), the sampling was purposive, and the selection of the study participants was inherently biased since, in many cases, local government authorities guided research teams to families they knew. In addition, due to the rapid design and implementation of the research, the government authorities had insufficient time to select households with children in a more balanced distribution of age groups.

To help offset some of these limitations, the research instruments were designed to collect similar information, but using different approaches. This form of triangulation strengthens the reliability of the data and its interpretation: in other words, the more that research findings are triangulated through different research instruments and methodologies, the more reliable they are.

2.9 Challenges in data collection and how they were overcome

(1) *Researcher fatigue*

Collecting quality observation data can be challenging due to the intense concentration and assiduous recording of information required over extended periods of time. The research protocol mitigated researcher fatigue by breaking up the 12-hour household observation into two separate days. Research teams later confirmed that this approach did help keep the direct observation task more manageable, and consequently supported a higher quality of observations and note-taking.

Study households were, as much as possible, selected to be representative of typical rural Ethiopian homes in ENGINE's areas of operations. This meant that the research teams were required to travel long distances to and from the town where the PCVs lived to reach the households selected for the study. The long travel extended the work hours for the research pairs, as they needed to compile their notes each night in order to record all of the details from the observations and interviews conducted during the day. This challenge was primarily overcome by the personal commitment and engagement of the research teams in their work. In spite of the long workdays, all of the researchers agreed that being present from sunrise when the observed child woke up, to sunset when the observed child went to bed, provided a comprehensive daily routine understanding. Notes that were not recorded in writing or through photography were recorded as "head notes[4]"- which were captured in writing later on during data quality checks, data analysis, and report-writing.

> "An hour to get there and an hour to get back made for full 8 hour days on both of our observation days, and that's without meeting to compare notes." (PCV)

(2) The "researcher effect"

The presence of outsiders, whether they be researchers, or government extension workers, or a community leader, can influence how family members usual behaviors and routines. This "researcher effect" therefore represents a potential threat to the reliability of the data collected. Since foreigners are so rarely seen in Ethiopia's rural areas, the PCVs faced additional challenge of piquing curiosity of community members. Whether it was children coming home from school, neighbors or government officials unexpectedly dropping by to check in on the study, this extra attention from people outside of the family had the potential to influence the routine behaviors and practices of the families participating in the study. Research teams overcame the "researcher effect" challenge- at least in part- in several ways. First, the teams spent extended periods of time with families (approximately six consecutive hours each day for two days in one household, and three consecutive hours in another household). The extended periods of time helped the teams and family members become accustomed to one another. Second, the Zonal Coordinators (all of whom are Ethiopian) generally took on the role of managing the occasional interruptions by curious visitors while the PCVs (all of whom are US American) conducted the observation and note-taking. Third, the researchers had been trained to be cognizant of the influence their presence could have on normal behaviors and to include field notes to report on their concerns. The observers (particularly the PCVs) were sensitive to body language and would occasionally pause in their note-taking or photo-

[4] Head notes are a recognized, invaluable form of field notes in the practice of anthropological research. They are distinct bits of information recorded in one's memory when- either because of limited time or because of a particular situation or circumstances- recording the information by writing on paper, or on audio, is either impossible, inappropriate or inconvenient.

taking when they noticed that a family member was uncomfortable or self-conscious. For example, in their observation notes taken while shadowing a mother, the research team in Bure wrote:

> *"2:57 pm – 3:17 pm: Sometimes the mother starts to feel uncomfortable so I stop writing- only for important things".*

(3) Husband consent

A number of the mothers were not comfortable agreeing to the study without first obtaining their husband's consent, regardless of the HEW's endorsement. The teams overcame this challenge either by waiting for the husband's return, or letting the mother know that they would reschedule their visit and return at another time when the husband would be available to provide his consent.

3. Findings

Findings from the qualitative data are presented by theme and consequences for child diarrheal disease and nutrition.

3.1 Human-animal relationship

Photo: Village mother with her baby, cooking in kitchen (where calf lives) in front of wall with dried cow dung cakes, used for fuel.

The human-animal relationship is key to understanding how and why young children in ENGINE areas are exposed to animal feces. Animals are tended during the day by older children, who take the larger animals out to graze. Sometimes they are tethered in the compound. At night they are kept close to the house, often in a separate room or structure that is attached to or part of the home or in some cases may sleep with the family in the house for fear of thieves. Chicken coops are rare, and chickens, including those of neighbors, wander at will. Young valuable animals, such as the calf in the photograph, may live in the house or the kitchen, at least during the day.

Women are responsible for feeding livestock and milking cows. Women also collect cow dung to shape into dung cakes, which they dry and use for fuel. Although women or children were observed sweeping (using brush collected from the land) in nearly all houses, animal feces are ubiquitous on the floors in many of the homes in the sample.

The needs of animals produce a rhythm of life for children and mothers, for example, feeding or milking livestock at certain times.

Contact with animal feces

Infants and young children are consequently in regular contact, and close proximity, to livestock, poultry, and their feces. Research teams were asked to rate the amount of feces present within reach/crawling/walking distance of the shadowed child as: (a) one or two pieces of feces, (b) a moderate amount, or (c) too numerous to count.

A summary of the types and numbers of animals kept by the 24 households, and contact between young children and animal feces, is provided in **Appendix 4**.

Perceptions of animal feces and causal connections to childhood illness

Of the 48 fathers and mothers in the sample, the majority said that animal feces were dangerous to children, however most said that with their current living situation, it was impossible to prevent little children from coming into contact with animal feces. Although researchers observed many cases of young children being washed after coming into contact with human feces, no one observed a child's hands or feet washed by a caretaker after coming into contact with animal feces. The results, therefore, are ambiguous with respect to how worried parents are about their young children's contact with animal droppings.

The reasons that parents said animal feces were dangerous were always linked to diseases, although perceptions of the relationship between animal feces and disease varied by site. In East and West Oromia as well as Tigray, it was the smell of the feces that was perceived as dangerous by all eight parents interviewed, as well as one father in Amhara.

> *"Playing near animal feces may not cause such a serious problem. It may expose them to the common cold, but it will not cause them any serious disease, especially if they avoid playing near it at midday when the feces smells."* -Mother, Alamata, Tigray

> "*Animal feces are not a big problem. The problem is with the urine because of the smell. The smell transfers disease. The child plays with the feces but there is no problem."*- Father, Efrata, Amhara

Meanwhile, a mother from Amhara mentioned smell from animal feces as bad for the child, but not as a disease causal agent. The research team reported that this mother had said, "*Animal feces may be contaminated with diseases which my child could get and smell bad which can make my child smell bad."*

Some parents, especially in Bure, Amhara mentioned the physical danger that animals could present to a young child:

> "*The chickens will peck the child, sheep and cows can crush the child."* (Bure mother)

> "*The cow will crush him, maybe endanger his life."* (another Bure mother)

> "*Small children could be attacked by animals if animals are present."* (Lumame, Amhara father)

The language parents used to explain the health danger of feces to children appears to come from the outside. The educational levels of the majority, but not all, fathers and mothers were noted. The majority of mothers, for whom there is information, had been to at least some primary school, but not all mothers. Yet the language of risks from contact with animal feces seemed to come from external sources (see External Information, this section).

For example, a Lumame father with a grade school education said:

> "*[I] feel bad [about my children coming into contact with animal feces] because the children could become contaminated with many diseases."*

A mother with a fourth grade education said, that animal feces could transmit, "*intestinal parasites and [pneumonia]"*. A father from West Oromia with a higher education than most in the sample (10th grade) said about open defecation (not animal feces):

> "*It is not good. There are communicable diseases like typhoid, typhus, and abdominal pain that can be transmitted".*

He may have felt similarly about animal feces but did not explicitly link it with those diseases.

Since this came at a point in the mothers' and fathers' interviews which had already primed respondents to think in terms of what they had learned about WASH recommendations, these responses do not necessarily reflect respondents' accustomed ways of thinking about animals and their feces and the meanings that attach to these.

The findings indicate that parents actually want more separation between their young children and animals. Most interviewed mothers and fathers said, in one way or another, that children and animals should be kept apart but some added that it wasn't possible in their environment. Many of the households had built separate rooms or buildings for the animals and this appeared to be an aspiration for many others. A few families had designated areas in their houses for their animals, even if there wasn't much separation between the animals and the family members.

Photo: Cows and family members in a compound in Lumame Gojjam, Amhara.

When asked how children could be prevented from playing near animal feces, 11of the 48 parents interviewed said that building a house to separate animals and children would be best. Fathers, especially, cited financial reasons for not doing so, although they were not asked the reason. However, a mother from East Oromia said:

People could keep animals in a separate compound and people in a separate compound, "but for us this is impossible because we have lack of access to enough land and we live together in one compound."

However, the reality of these responses is brought into question by one of the more well-off farmers who volunteered that when he is more financially secure, he planned to build a house for the cattle so they can stay separately during the daytime and nighttime from the family's living quarters.

3.2 Housing

Research teams recorded detailed descriptions of homes and compounds. The findings revealed that the families participating in the research live in compounds that may include several households living in separate houses. The residents of the other houses in the compound are often, but not necessarily, related to their neighbors in the compound. One of the families in the sample lived in a more spacious, better equipped house, which the research team described as typical of rural middle class houses in the area. However, this was one of the poorer families in the sample: the house was not theirs, but belonged to a wealthier relative who was letting this family stay rent-free until he could rent out the house. The family living in this house owned no animals. Another family (one of the few without a latrine) was renting their house. All other families in the research appeared to own their dwellings.

Animal-human separation

Few compounds allowed for much or any animal-human separation. Houses were constructed of wattle and daub, mud, or boards. Every home, from the wealthiest to the poorest, had a packed dirt floor. Some homes had tin roofs, others had thatch. Home size varied from 4x5 meters to over 50 square meters. The home could be divided into up to three rooms or in some cases one large room was divided into separate areas through temporary means, usually hanging a curtain, sack or piece of material. Kitchens might be a separately constructed, usually flimsy, building or a separate room attached to the house, or a dedicated space, not physically set apart, in one part of the house. In a few cases, the cooking area was located immediately outside the home.

Photo: A child plays with sheep in the family compound in Woreta/Fogera, S. Gondar, Amhara.

Interestingly, descriptions of where animals were kept at night and during the day noted on the house description forms sometimes contradicted what teams observed during the 12-Hour child observations. In the descriptions, there was usually some separation of animals and humans through keeping animals in separate rooms or a corral. While this was also reported in the observations, many more households were observed to bring animals into the house during the day- when the child responsible for pasturing the animals came home for lunch- and to keep young calves

in the house. Perhaps the discrepancy is just capturing is the movement of animals throughout the day.

In one case, a calf was kept in the kitchen during the day and the grandmother slept there at night. In West Oromia, cows, chickens, and a kitten were reported as being in the house on the WASH Observation Checklist, and in SNNPR, chickens, cows, and two sheep were kept in the house in a room with only partial separation from the living area. Children can easily come into contact with chicken droppings, and sometimes large animals' feces, while in the home. It was when children are playing outside the home in the compound; however, that they almost invariably came into contact with animal feces. Some families provided shoes for toddlers, others toddlers were either observed barefoot all the time or would only agree to wear shoes some of the time. One mother was reported to walk barefoot (researchers were not asked to comment on mothers' footwear, only whether shoes were removed before entering the home.) No one removed shoes before entering the home.

Table 3 below describes some of the separation of humans and animals reported by in the household description forms.

Table 3. Examples of Animal Living Arrangements in Houses and Compounds of WASH Study Families

Animal Living Arrangement in Household
Two store rooms attached to house, sheep kept in one room, cows outside, dog and chickens roam free (two households); animals defecate near play area.
Animal houses built into side of family home, animals stray there at night; animals roam during the daytime—sheep and chickens enter house at will.
Animal shelters built into side of family home, sheep, cow, and horse stay there at night; sheep roam compound or are taken to graze during day, chickens wander compound—including house, during day.
Cattle kept in corral at night, chickens and cat roam compound day and night; cattle graze in fields during day.
All animals (dogs, chickens, cattle, and camel) stay in the compound outside the home at night, tethered to posts; during the day dogs, chickens, and a few cattle are kept inside compound outside home or are let out to graze.
Cows are brought into the home at night, in a separate room; cows are tied up about 30 meters from the house during the day.

***Estimated by the research team**

3.3 Flies

Research teams "shadowed" 12 children between the ages of 6 and 24 months by following them and observing their activities for twelve hours. Young children, whether in the home or especially outside within the family compound, frequently come into contact with animal feces or are in danger of doing so. Animal and human feces attract flies and there were many flies surrounding and on children. Research teams were asked, during the 12 Hour Child Observation, to choose a two-minute period when food was not served and to count the number of flies within three feet of the observed child. Flies are an important transmitter of the causative organisms of diarrheal disease.

Flies were plentiful on children, particularly their faces. Researchers counted from 1-3 on a child's face all the time to more than 50 or 60 flies on a child at one point. Most fell in the 10-20 range. One research team counted 60 flies the first day and 40 on the second.

Table 4 below shows the fly count noted by the twelve research teams during the observations:

Table 4. Flies per Child (Shadowed Child 2 Minute Fly Counts)

Number of Flies Reported per Child	Number of Teams Reporting
1-3	**1**
≤ 5	**1**
8	**1**
10	**2**
13	**1**
15	**1**
16	**1**
20-30	**2**
30-50	**1**
(60&40)	**1**

Researchers noted that children did not seem bothered by the flies and some mothers also did not seem bothered. However, in the Father's WASH interview, several of the fathers noted that they had built latrines partly to keep down the number of flies. Only one parent, in the WASH interviews, noted that flies could transmit disease. One mother in the WASH observation had scattered twigs of black pepper plants in her kitchen to keep the flies away and said this was traditional. In the sometimes very smoky kitchen areas, some research teams noted that the smoke kept away flies. Fathers commonly noted that an advantage of latrines is that they kept the flies from breeding and reduced the number of flies. However, no one else connected transmission of disease directly to flies.

3.4 What goes into children's mouths

Research teams recorded everything that went into the shadowed children's mouths during the observations. Observations documented loving mothers who, when they saw their young children put something obviously dirty in their mouths, would remove the object and move it away from their children. The teams noted that mothers in the sample were, however, also extremely busy and missed most of what the child decided to explore orally.

In Ambo, Oromia, while the 9 month-old girl shadowed by the research team was constantly in the presence of her mother, the two older children wandered around the compound and went to play with other children out of the mother's sight.

What goes into Baby's mouth?

April 2 (observed 8 am-1 pm), Ambo Household, Amhara

- Mother's clothes
- Neighbor's clothes
- Sister's fingers (3 separate occasions)
- Cloth from coffee covering
- Neighbor's hair
- Breastfed multiple times
- Bread from neighbor boy**
- Bread**
- Cow's milk (gr. Mother fed by hand) **
- Piece of wood
- Spoon (playing)
- Kitten's tail
- Mother's fingers
- Small piece of bread**
- Stick
- Leaves (at least 7 times)
- Potatoes with egg (fed from mother's wet hand—she had first washed hand with water only]**

A curious 9-month old girl sits near a kitten in Ambo. The kitten's tail was one of the objects that she put into her mouth during the observation.

April 3 (observed 7:30 am to 12:30 pm)

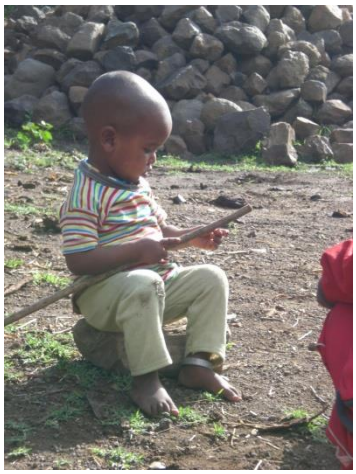
- Metal spring (from sister's hand)
- Plastic rattle
- Woven pot holder (10 times)
- Shoe polish can
- Spoon (playing, 5 times)
- Mother's shoe
- Straw/hay from ground
- Egg from wet bowl (fed by father from spoon)
- Pen (from sister)
- Dirt
- Doll's head
- Eggs (leftover from earlier; fed by mother from spoon)
- Cup of water (not boiled or filtered, from stream)
- Breastfed multiple times
- Cow's milk from grandmother's unwashed hand
- Another child's lips
- Injira
- Grass/straw from ground

What goes into Baby's mouth?

A 20-month old boy, fed by his mother, has injera for lunch, in Bure, Amhara

April 1 2014 (observed 6:30 a.m. to 12:30 p.m.), Bure Household, Amhara

- Breastfeeding
- Sugar cane (given by mother)
- Piece of hay
- Breakfast (served to him) which he eats with his hands
- Water (from a tin can that has been poured from a clay jug)
- All his fingers (after finishing breakfast)
- Second serving of breakfast (served by mother)
- His hand (while he is rolling around on the dirt floor of the house)
- A piece of bamboo from the ground of the compound
- A piece of bamboo from the ground of the compound (again)—the mother then ties it into a ring to make a toy and tells the child to play with it
- Water from a stainless steel cup
- Bamboo toy mother has made
- Water from a tin can (from kitchen)
- Piece of injera his mother is cooking (given to him by his mother)
- More injera from his mother
- Another piece of injera (which he has asked for and cried)
- Breastfeeding
- Sugar cane (given to him by his sister)
- Bamboo toy (which he previously abandoned on the ground in the area where the animals stay and defecate)
- Another piece of injera
- Breastfeeding (mother had tried to stop him and get him to finish his lunch)
- Finishes lunch



April 1, 2014 (shadowed child observation)

- Sucked on the front of his tee shirt
- Picked up a branch and tried to peel the bark off with his teeth
- Picked up his piece of bread that had fallen and continued to eat it
- Chewed on a stick from the compound

Photo: 23 month old boy from Tigray plays with a stick

3.5 Ground surfaces and covers

Half the youngest (pre-walking) children were placed on a piece of cloth or sack on the ground; the other two were placed directly on the dirt floor or ground when not being held by the mother. Mothers often wrap little children on their backs to keep them safe. When asked during the WASH interview how one could keep young children away from animal feces, many mothers responded that the solution would be to carry them more.

Photo: A 9-month old girl plays on a plastic mat in her home in Ambo, Amhara.

Since most young children spend a good deal of their day sitting on the ground or dirt floor of their house, what they wear on their bottoms has some significance. Little girls and boys are dressed in pajamas and boys may wear pants and a shirt; girls may wear a dress. The large majority of shadowed children wore pajama bottoms or nothing at all.

What do Babies wear on their bottoms?

- 1 child wore pants
- 4 children wore nothing at all
- 4 children wore pajama bottoms
- 2 children wore pajama bottoms during part of the observation, and nothing during another part
- 1 child- no report by the team

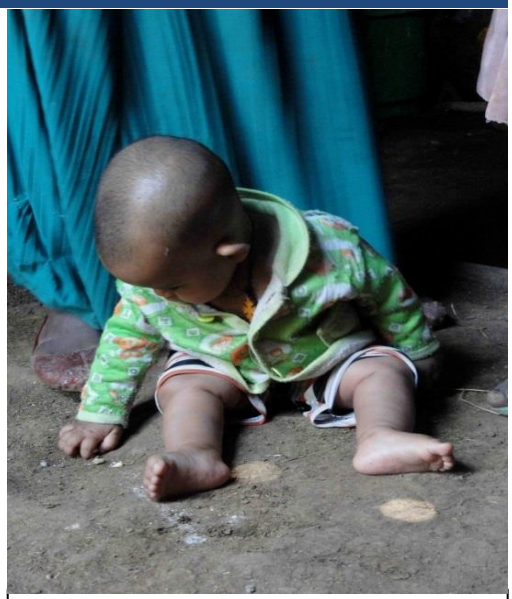


Photo: 21 month old child in Woreta/Fogera, S. Gondar, Amhara sits on floor in pajama bottoms.

3.6 Child caretakers

Mothers

In the 12-hour observations of young children, mothers were always the primary care taker. Mothers' roles include a variety of tasks. When asked in the WASH interview how they spent their day, all 24 mothers replied that they take care of their children, clean the house, and prepare the meals. Eight mothers also mentioned that they work on the farm and six explicitly mentioned caring for livestock, although it is possible that all mothers in families with animals did so because both observations indicated that mothers and other women (e.g., grandmothers) milked and fed the family's animals. It was clear from mothers' answers that they did far more, but that these were the most memorable tasks for them at that moment. Other common answers included: collecting water (4); collecting wood for fuel (4); going to market (5); socializing, especially with a coffee ritual (4); and preparing alcoholic beverages and selling them (3). One woman mentioned doing washing for money;, another said she makes *kocho*, a local bread, in others' homes to earn money. All mothers cook over an open fire and must fetch firewood, or if they have older children who can help out, the child must help fetch firewood.

Photo: A mother prepares a meal for her children at Gedeo zone, Dero Kebele in SNNPRS.

Sweeping the compound, house, and kitchen to get rid of cooking debris, animal and child feces, and other items considered to be dirt is also the mother's responsibility, although in both observations, older daughters were observed to be sweeping. Not all mothers sweep thoroughly and the number of times a house is swept per day seems to differ by mother. Nonetheless, mothers of young children are extremely busy and have little spare time to watch babies closely enough to prevent the child from putting into her/his mouth much of the environment. In addition, all mothers were breastfeeding their child and only the mothers of older observed children (23 and 24 months) seemed to occasionally discourage their children from breastfeeding.

When asked "who usually takes care of the baby?" all mothers responded that they did. However, mothers also mentioned other people who take care of their children. Four mothers named their babies' fathers (their husbands) as another primary care taker. Other care takers named by mothers included: the eldest son (1), daughters (3); sister-in-law (1); neighbor's girls (1). The research teams observed many people other than mothers minding the children, giving young children food, washing the children's hands and bodies, or disposing of their feces.

TABLE 5. Others taking care of young children

(shadowed child observation)

Care Taker	Number Observed
Father	5
Older sister	6
Older brother	4
Another female child relative	1
Neighbor child (girl)	1
Grandmother	2
Grandfather	1
Another adult female relative	1
Adult female neighbor	1

There was no correlation between the number of additional child minders and the age of the child. The number of additional child minders ranged from 0 in Lumame and Decha to 4 in Sinana. The usual number was two additional people taking care of the child.

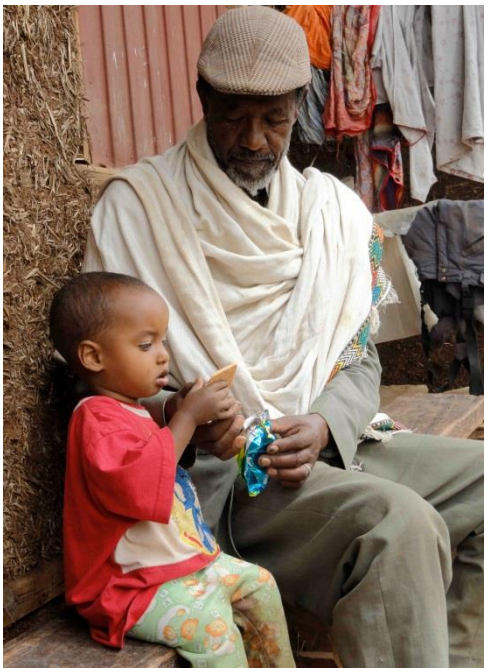


Photo: A grandfather gives his grandson a biscuit in S. Gondar, Amhara.

Older siblings

The research teams observed that when a young child is not in his or her mother's view, older sisters and older brothers often provide the child care for their younger siblings. Unlike other mothers or grandparents who would scream in disgust when a child placed a dirty object in his or her mouth, older siblings did not intervene or enforce the same precautions as mothers and grandmothers do. Some mothers expressed concern that their older children who sometimes minded their babies were not attentive enough. This was borne out by the researchers' observations. For example, a small child who was being watched by his sister defecated. No adult was around at the time, and the girl did not wipe her little brother.

Photo: An older brother carries his younger brother on his back in Alamata.

Photo: A six year old girl carries her young sister in Dembecha West Gijjam; Amhara.

The researchers said that the child seemed to be uncomfortable from not being cleaned, but rather than cleaning her brother, the sister carried him on her back (thereby exposing herself to fecal contamination). In other instances, children told to mind baby siblings did so until their attention wandered and they became involved in another activity.

Fathers

Most fathers were farmers. One worked as a guard and one said poignantly that he spent his days looking for work. One father also taught biology at the local school in addition to farming. During the WASH interviews, fathers were asked whether they ever took care of their young children. All but 2 of the 24 fathers said they took care of their young children at least some of the time. Specifically, they noted that they fed them and washed them. A few fathers said they washed the baby's clothes. In two cases, the fathers denied taking care of their children (one reneged when pressed).

Photo: A father plays with his child in Alameta.

Photo: A father takes care of his child in Sinana, Bale Robe East Oromia.

Fathers saw their overall role as managers in caring for children: making sure that the child was kept clean and healthy, as well as providing for their children. One father said his role was to be a "coordinator". During both the 3-hour handwashing observation and 12-hour shadowed child observation, researchers observed fathers waiting to see if the mother was around when the child defecated. If she wasn't, the fathers would pick up the child, get the baby out of the dirty pajama bottoms (if s/he was wearing any), clean and wash him or her. Both fathers and mothers washed children's hands on other occasions.

Photo: Latrine in Bolosse Soro, Waleyta Family Compound in SNNPR.

3.7 Latrines

The majority of latrines were 15 meters away or less from the main dwelling (12 out of 21) and 5 of these households had latrines 5 meters away or less. Three households had latrines that were 20-30 meters from the main dwelling. One household had a latrine "greater than 30 meters" away; 1 household's latrine was 35 meters away. One household had filled up their latrine (which had been located 15 meters away from the house) and were in the process of digging another latrine 15 meters away from the house. In the meantime, they were sharing with their neighbors, whose latrine was located 45 meters away. The latrine of one household was located 50 meters away from their house.

Surprisingly, the latrines, although simple holes in the ground with little infrastructure, seldom had a strong

odor. Most latrines didn't have a great number of flies and mosquitoes were only observed in one latrine. Researchers were asked to rate the smell coming from the latrine of a scale of one (defined in the research instruments as "little or no smell") to five (strong smell, defined in the research instruments as "if I stay here one more second, I'll throw up"). More than half of the latrines (12) were rated one or two and of those twelve, eight were rated one. Four latrines were observed to have a moderate amount of smell (ranked as three) and only one rated a four. There were no fives. An explanation could be that the latrines were not used, and yet some were observed by the research teams to be used. Another explanation for the lack of smell could be that the environment was sufficiently arid to dry latrine contents quickly. A summary of latrine cleanliness, which is important in feces-fly-food transmission, is provided in **Appendix 5**.

Photo: A latrine in Lumame, Amhara. *"The latrine is made from sticks. There is no door. It is very open. There is no plastic covering the outside of the latrine for privacy and old feces fill up the latrine pit. However, there is no smell because it looks like latrine hasn't been used for defecating in a long time." ~Research team's notes.*

Some researchers commented on how well worn the path to the latrine was as a sign of how well-used the latrine was. Latrines generally appeared to be used.

The average number of people using a latrine was slightly over four people, and ranged from three to seventeen people. While all participants said that it was fine for men and women to use the same latrine, one mother said she thought it was a good idea to have separate facilities and she wished that were possible.

While a few handwashing stations were observed, some of which had ash piles, it appeared to researchers that none were accustomed to being used. Filthy or dry tippy taps were found next to two latrines.

3.8 Child Defecation

Only two or three of the oldest children among the twelve observed were toilet trained: one went to the latrine by himself, the other was potty trained to go on a little plastic potty (a po-po) and a third let his mother know when he needed to have her pull his pants down so that he could defecate (in the open). The remaining nine children defecated wherever they were whenever they felt the need. An adult, almost always the mother (unless the father was present and she wasn't), cleaned the child. In one observed case, the child's aunt cleaned the child. In a few cases, the mother or grandmother sat on the ground with her knees bent and legs spread slightly apart as the bare-bottomed baby stood on the mother's or grandmother's feet. His bottom was positioned between the adult's legs and her/his hands were held by the grandmother or mother, who encouraged the baby to defecate.

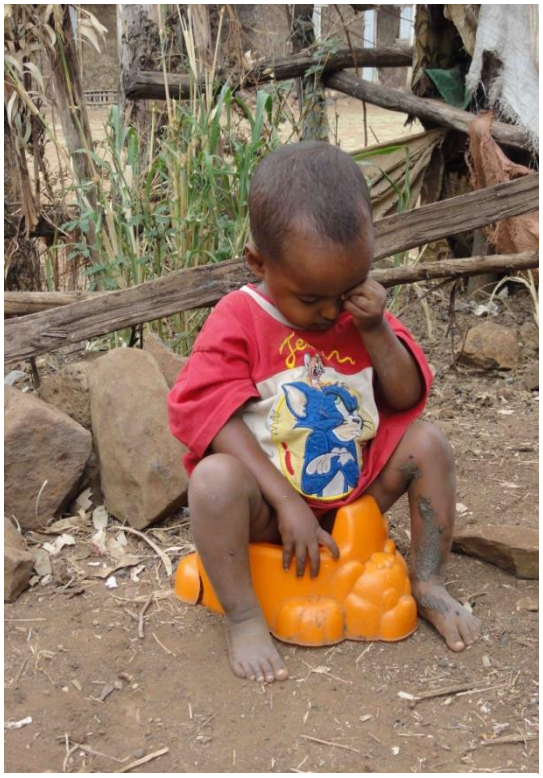


Photo: 21 month old boy on a potty chair in Woreta/Fogera, S. Gondar; Amhara.

The observed babies did defecate in this position. It appeared to those analyzing the data that this might be a gentle, loving way to begin to introduce young children to intentional defecation.

Photo: A child defecates, supported by his mother's feet. Dembecha, Gojjam. Amhara.

Photo: A child defecates, supported by his grandmother's feet. Dembecha, Gojjam. Amhara.

While adults used the latrines, young children generally did not. An example of how common latrine use was in most households is supported by a mother responding to an interview question about her 16-month-old toddler's probable contact with human feces. She explained: *"The baby will often*

times go near the latrine and likes to play there. He also likes to go into the latrine and pretend to use the latrine like the way he has seen adults using it." The mother said she was afraid that her son would fall in or come into contact with human feces. Many mothers, both in the WASH interview and during the WASH observation, expressed fear of their young children falling into latrines.

Older children (e.g. those between the ages of 3 and 7 years old) practiced open defecation in uncultivated land, even when the family had a latrine. Mothers mentioned this during interviews, and the researchers observed this as well. Children older than 7 also practiced open defecation, but this was not allowed by some parents, who felt the child was old enough to use the latrine. However, observers did also see this occur. And some parents felt that it was all right for children of 7 or 8 years to defecate in the open. The children generally had specific places immediately outside the compound they would use for defecation. A summary of how young child defecation was treated among the children observed for 12 hours is presented in **Appendix 6**.

Several mothers commented that adults' feces are dangerous, but babies' feces are not. In the WASH interview, most mothers reported that they threw the baby's feces on uncultivated land or on cultivated land, as a fertilizer. Many fewer reported throwing the feces in the latrine. A very important trend that is reflected throughout much of the observed behavior is inconsistency. On one occasion a mother might throw the baby's feces in the latrine, while another time she would throw it in the open.
Babies were wiped with a variety of substances, mostly leaves or clothing. It appeared that in a pinch, almost anything would do. Many babies were washed instead of -or in addition to- being wiped. Both fathers and mothers were observed to do this.

Photo: A mother in Woreta/Fogera, S. Gondar, Amhara prepares to wash her son with powdered soap and water after he defecates.

Cleaning up the ground or the dirt floor after the baby had defecated achieved varying degrees of success, depending upon how assiduous the mother was. Several researchers either saw visible feces after the mother had cleaned up the feces or hypothesized that the feces must be there but wasn't so visible on a dirt floor. With the numerous flies, the remnants of babies' bowel movements must have constituted another source of fecal-oral contamination.

3.8 Adult Defecation

Twenty out of the twenty-four households had latrines. All latrines were simple holes in the ground, with a couple of boards of logs serving as the slab or plate on which to stand. A few latrines did have concrete or wooden slabs.

Photo: Latrine in Gedeo zone, Dilla woreda, Dero kebele, SNNPR

Except for one household, where the team suspected that the latrine was not used frequently, latrines seem to have been used by adults, but not necessarily consistently. One mother commented that if she was in a hurry to go somewhere and wasn't going by the latrine to get to the road, she would defecate in the open and one researcher observed a mother defecating next to (outside) the latrine.

Three families shared latrines with one or two other families and the other seventeen families had latrines that only their family used. This may be the reason that almost all latrines had flimsy superstructures that provided little or no privacy, e.g., many had no door, some were so poorly constructed that the walls offered little privacy. Almost all the fathers said that they had built the latrine. In one case, the father said he had hired someone and in another case, the person who had built the latrine was also roofing the house. One of the reasons that people who defecated in the open wanted latrines is for privacy, because they said they could only defecate in the early morning or evening, when it was dark. However, almost all of the latrines in the study offered little privacy and some of the latrine owners also commented that they wanted to build better latrines for the sake of privacy.

3.10 Handwashing

Since handwashing is important in the WASH literature and handwashing with soap and water or ash can prevent a large minority of cases of diarrheal disease in young children, all three observations and the interviews included handwashing. During the WASH observation, researchers were asked to observe and note handwashing by all visible family members during the WASH Observation, which may have been longer than three hours. Findings reported on handwashing observations of all family members are recorded in **Appendix 7.**

Photo: A young boy's mother and older sister wash his hands with powdered soap and water in Alameta.

Handwashing appears to be important to the family members in the study sample and to have at least a few meanings attached to it. Handwashing could be a sign of respect, as when a daughter poured water over her father's hands for him, before her father ate a meal, or when a mother hosting a coffee ceremony poured water over the guests' hands at the beginning of the ceremony. While many study participants referred to handwashing information they had heard from HEWs or AEWs, several mothers said that their own parents had taught them to wash their hands- that this was part of their tradition ("*We know this.*").

Researchers shadowed mothers in each of twelve different households (i.e. half of the sampled twenty-four households in the study). They observed all the mothers' handwashing during the three-hour observation period and coded the handwashing by activity (e.g., cooking, feeding a child,

handling child's feces or urine, handling animal feces, etc.). They noted whether the mother washed her hands before the activity, after the activity, whether she rubbed her hands three times, whether soap or ash was used, and how she dried her hands. An example of a 3-hour observation of mothers' handwashing practices during meal preparation is included in **Appendix 8.** A summary of shadowed mothers' handwashing practices during the three-hour handwashing observations is provided in **Appendix 9.**

Photo: A mother in Sinana, Bale Robe; East Oromia, prepares coffee.

Photo: A mother in her kitchen, in Bure, W. Gojjam Amhara.

Photo: A mother in Sinana, Bale Robe, East Oromia.

Photo: A mother cuddles her child in Alameta.

Use of soap or ash with water during handwashing

Half of the twenty-four households had some form of soap, whether bar soap, powdered soap, or laundry soap. One family reported using soil to clean their hands, "*especially if it is the kind that is darker in color.*" Although there were many occasions when family members washed their hands, soap was observed to be used infrequently. Almost no mothers used water with soap or ash to wash their hands; instead they used plain water.

Rubbing hands during handwashing

While soap was observed to be used infrequently for handwashing the great majority of handwashers rubbed their hands together at least three times, which is—parenthetically--part of the international recommendations for handwashing. Mothers usually rubbed their hands together at least three times. Observers reported that mothers would often rub their hands while washing during an activity such as cooking. Out of all the observed handwashing episodes, research teams only noted eight times when the person washing his/her hands did not rub them together at least three times (Table 10).

Drying hands after handwashing

Almost all mothers air dried their hands (another international recommendation for handwashing). During the WASH observation (conducted in all 24 households), those mothers who washed their hands or whose hands became wet accidentally let them air dry. Seven few wiped them on their clothes and one wiped her hands on a dirty curtain. Observers recorded only one occasion when a mother used a clean cloth or towel for drying her hands. Those who did not air dry their hands, or who did not use a towel, were presumably using something dirty to dry their hands. The WASH observers recorded a few mothers using their clothes or whatever was around, e.g., dirty curtains, to dry their hands.

Hand washing stations

During the WASH observation, eight of the twenty-four households were observed to have a special place near the latrine for handwashing (a handwashing station). Handwashing stations included two tippy taps made out of jerry cans with spouts attached to them: one had nothing in it and the other had only two remnant pieces of soap and appeared to the observers to have been used little. However, the researchers observed the mother using the tippy tap to rinse out the observed child's potty, which she scrubbed with newspaper.[5]

The research teams had their doubts about some of the handwashing stations they observed in use. One team noted, "The handwashing station had a water bottle with spout and a bag of ash. However, based on our observation we believe this was just for show. There was no footpath leading to the handwashing station as there was leading to the latrine." Other teams found empty tippy taps, and no soap.

The findings indicate that, while stationary handwashing facilities may not be present or in use, *portable* handwashing facilities do exist. For example, a team noted, "They [the sample household members] use a little jug and pour water over the hands in intervals: pour once, put jug down, scrub, pour again, repeat two more times). There is no collection bucket, they pour the water over the mud floor. There is no outside hand washing station)." A different team noted, "hands are washed using a portable jug and basin. Mom says that a jug of water is brought to the latrine with the person who goes. There is no stationary handwashing area." A team from another area noted, "There is no designated handwashing area. There are water jugs and basins that are stored in the house and can be easily transported to different areas for handwashing)."

[5] This family had a sister/daughter who worked outside Ethiopia as a maid and sent home remittances twice a year: about ETB7,000 each time, which could account for the plastic potty, which was not observed elsewhere.

Mothers' handwashing practices before cooking, eating, or feeding children

The majority of mothers who were observed cooking or eating washed their hands before beginning the activity. The majority of mothers did not wash their hands before feeding their child. None washed hands before breastfeeding. It appears that mothers wash their hands on more occasions than a three-hour observation of mothers can reveal Findings from some of the other study methods suggest that mothers wash their hands during the course of an activity that involves water, such as cooking or cleaning dishes—ten mothers were recorded doing this. There were nine reported occasions of handwashing before eating, but it is possible that not all observations were around mealtimes.

Bathing infants and young children

All ages of observed babies were bathed in the morning after their first morning breastfeeding. However we do not know if all babies were bathed because not all research teams were able to arrive at the study households before the baby awoke in the morning. While bathing their baby, mothers may wash their own hands. Some mothers wrapped their child in a blanket to dry and cuddled him/her while they breastfed the child a second time after the bath. Fathers were also observed to help their children to wash their hands, and to clean up their babies after they defecated.

Photo: Mother cleaning baby with soap and water in Woreta/Fogera, S. Gondar. Amhara

Photo: A young girl washes her little brother in Sinana, Bale Robe. East Oromia.

Mothers' handwashing practices after handling feces or urine

The majority of mothers washed their hands after handling anything pertaining to feces or urine, whether the child's, their own, or an animal's. However, some did not wash their hands after handling feces. Only one in nine washed her hands after handling an animal. While the majority did not wash their hands after touching a probably contaminated surface, several did.

Mothers' handwashing practices before or after milking animals

Several mothers who were observed milking their cows, washed their hands (with water only, not with soap or ash) before they began this chore. In the WASH interviews, some of the fathers, and one mother, commented that washing hands before milking an animal is recommended by AEWs. Some said that they were told by the AEWs that hands should also be washed after milking.

Excerpt of Handwashing Observation Field Notes

"Feeding child: The child was given milk from the cow, immediately after it was milked in the living room. The mother washed her hands with soap before milking, but the child's hands were not washed during the 3-hour observation. The mother did not wash her hands between milking the cow and feeding the child. The milk was first put into a stainless steel bowl, then transferred to a glass for the child to drink. Both were rinsed with water before using. A fly did enter his glass of milk, but was taken out by the mother.

Breastfeeding child: No longer breastfeeding

Eating: Only the child was observed eating today

Defecating/using latrine: Not observed

Handling animal feces: Intentional handling of animal feces was not observed

Handling animals: Before milking the cow, the mother washed her hands with soap and air dried. With other handling of animals, like touching the cows, no handwashing was observed.

Touching surfaces likely to be contaminated: Due to the overall lack of sanitation and living amongst the animals and their feces, most surfaces were likely to be contaminated. Only the mother was observed to wash her hands – once while fetching water (no soap, air dry), and once before milking the cow (soap, air dry)."

Differences between WASH-related knowledge and practices

The overwhelming majority of mothers and fathers were able to cite WASH recommendations, sometimes nearly chapter and verse of national and international WASH guidance, as communicated to them by the HEWs and AEWs. For example, one mother told the research team that contaminated feces led to Giardia or pneumonia. The interviews also revealed that nearly all study participants knew that there are certain times one should wash their hands. In the WASH interviews, it sometimes appeared that messages were quoted verbatim, or that parents parroted answers that they believed the research teams wanted to hear. However, research teams reported significant differences between what parents reported as their WASH-related practices, and what they were actually observed to do. The contrast between parents' reports of WASH-related practices and researchers' direct observations of WASH-related practices reveals a classic gap that exists between knowledge, attitudes and practices ("KAP gap"). The findings indicate that hygiene education has focused more on raising awareness of ideal practices, and less on promoting improved practices that are meaningful, doable, and desirable enough for people to adopt in their day-to-day lives.

3.11 Water

Water sources were located at a variety of distances from the family's dwelling. The majority of households had potable water sources. The list of water sources where families obtained their drinking water is provided in Table 6 below:

Table 6. List of Water Sources and Households Accessing Water

Water sources	**Number of Households Accessing Water**
Protected Spring	10
Community standpipe	4
Household standpipe	3
Protected well	2
Water purchased from a vendor	2
Standpipes occasionally	occasionally
Unprotected spring	4
Rainwater (not for drinking)	1

The great majority of households (21) got water from protected sources, while 8 got them from unprotected sources. The one household that collected water from their roof used the water for purposes other than drinking or cooking, e.g., washing clothes.

Five families got water from two sources because some community water sources were closed periodically when the water was being treated or for other, unspecified reasons that the water was turned off temporarily.

Time collecting water ranged from one hour to three minutes. Mothers said that the family needed to collect water once or twice a day. Families collected water in large jerry cans. Many mothers said or were observed to wash their hands, face and feet when they collected water (none was observed using soap). Jerry cans varied in size but those used to collect water generally ranged from 25-30 liters in size. Women and children carried the jerry cans on their backs up, for some households up

and down steep mountains paths. One husband and wife went to collect water together, transporting it on their camel. In a better off family, a "servant boy" collected the family's water in a horse-drawn cart.

Table 7. Type of people collecting water and number of households

Person collecting water	Household
Mother	11
Father	2
Mother & Father together	2
Daughters	2
Mother & Daughters	2
Children	2
Son	2 (a third son always bought the water from "town" families when there was no water at their usual source)
Servant boy	2
Children who helped or fetched water sometimes	4
Mother-in-law (when mother is ill)	1

Water collection was such an important activity to mothers that seven of the eleven mothers mentioned this as one of the ways they spent their day. Needless to say, the mother who needed to walk one hour round-trip to collect water, together with her ten-year-old child, was one of those who mentioned fetching water.

Water collection is traditionally a female occupation, but as is evident from the behavior, this ideal norm doesn't determine all behavior. One mother from Tigray succinctly articulated the norm of female water collection:

> "*Females should collect the water because they have the most time available, but if a male collects water it might be shameful. Men should have to save their energy for farming activities… It is said that the strength of the woman comes from her buttocks and the strength of the man comes from his shoulders, so a woman should carry things and a man should farm."*

<u>Photo:</u> Mother returning from collecting water in Gimi, W. Welege, West Oromia.

Water storage is an important link in the chain of possible fecal contamination. Families stored water in a variety of vessels, as recorded in Table 8.

Table 8. Number of Households using Types of Water Storage Vessels

Water Storage Vessels	Number of Households
Jerry Cans	17
Large clay pot or jug	6
Large plastic container	3
Used cooking oil container	3
Bucket	3
Big basin	1
Roto container (large 125 liter container)	1
Open pot for cooking	1

Families had multiple water storage vessels, such as jerry cans of different sizes as well as a large clay pot or jug. While there were a few instances of children putting hands in water containers, this was fairly small, probably because small children were in the kitchen with their mothers while they cooked or worked and the mother was working with water as she cooked. She could more readily prevent little hands from exploring the family's water supply than she could prevent unwelcome explorations elsewhere. Although some vessels did not pour, mothers were very careful not to touch the water and only two accidental contacts between a mother's fingers and the stored water were reported among the twenty-four WASH observations.

Most of the containers had covers or were covered by placing something on top of them (e.g., a pot). However, due to the way the question was worded, it is unclear whether almost all containers were covered or only a two-thirds of the containers.

People generally poured water from a larger container into the smaller plastic or clay jug, which could be used for many purposes, e.g., washing hands, filling drinking cups or pots for cooking or making coffee or taking to the latrine to clean after defecation.

Researchers did not ask whether and how the water containers were cleaned. One mother and one father volunteered that the wife cleaned out the containers periodically. Researchers observed mothers rinsing out the containers before filling then at the water source, but no one noticed any disinfectant or cleaner being used. Research teams commented that the outsides of some storage containers appeared very dirty. While this may not have affected the water inside, there was an instance of a young child putting part of a water container in his mouth.

3.12 Parents' recommendations for improved family WASH practices

During the interviews, mothers and fathers were asked for their recommendations to keep children from coming into contact with feces. The most common responses were to build separate quarters for the animals, even a room attached to the house, and to sweep, especially the compound, more frequently. Two less frequent, still common, responses were to carry young children more on the back or to watch them more carefully. Three of the four mothers who made the comment specifically referred to the baby's older siblings when they minded their very young brother or sister.

The list below is a summary of the main recommendations repeated by multiple respondents:

"*A separate room could be prepared for the animals to keep them away from the children*" (mothers and fathers from all regions made similar statements)

- "*Another way to prevent [children from playing near animal feces] is giving other materials for them to play with."*
- "*We need a separate play area for children* [to keep them away from feces]."
- "*Cleaning the compound and not allowing children in dirty places."*
- "*Carrying a small child on the back, sweeping the compound to get rid of animal feces.*"
- "*Watching the baby better".*

Some of these recommendations were already put into practice by many, or at least some, families, for example some families were already using separate animal quarters and practiced frequent sweeping.

4. Discussion

ENGINE's SBCC interventions to improve WASH-related practices must be carefully designed within the context of what is clearly a challenging hygiene and sanitation environment. An effective SBCC/WASH strategy requires an appreciation of what is feasible ("doable") for families, as well as an understanding of what would motivate people to improve household practices and actions.

This study has documented the many ways that young rural children can and do come into contact with human and animal feces. Under these circumstances, washing with soap and water or ash at appropriate times will interrupt the route of enteropathogens some of the time, but perhaps less than the percentages calculated by Curtis and Cairncross in their review (op cit). In this section, we discuss some of the reasons for children's high risk of fecal-oral transmission, as well as their implications for ENGINE's SBCC programming in support of improved WASH and nutritional outcomes for young children.

Few if anyone has systematically observed and published what goes into babies' mouths or what they are touching with fingers that will invariably go into their mouths. Yet, in an environment heavily contaminated with a fecal film, this is possibly the most crucial hygiene-related issue for the nutrition and health of very young children. Exploring the world through the mouth is the way young humans learn. It cannot be prevented because it is a universal part of human development. All that is possible is to try to reduce the pathogens in the young child's world.

As the noted biologist turned developmental psychologist, Jean Piaget, documented, children learn a huge amount during their first twenty-four months. In the beginning, children tend to be oral, exploring their world by putting much of it in their mouths. In a world where there is a very thick fecal film due to the presence of animal feces, children's open defecation, and an abundance of flies, much of what the young child puts in his/her mouth will be contaminated.

Culture also plays a large role in shaping children's exposure to their environment.[6] Rural Ethiopian babies are active and generally free to satisfy their curiosity about the world. This is not necessarily the case in other countries or cultural settings, e.g., in cultures where babies are swaddled or where parents hover over their young children. In a resource poor environment, freedom to express curiosity and explore one's surroundings may enhance knowledge and ability to fully exploit existing resources: a very valuable trait.

In order to prevent the ingestion of pathogens that could result in poor nutritional outcomes, particularly stunting, ENGINE's SBCC programming should facilitate new or enhanced family practices that limit some of their babies' freedom to explore the world. To be effective, SBCC programming will, however, also need to acknowledge and respect the cultural context of Ethiopian childrearing practices, and to appreciate the possible adaptive personality traits that may result from this style of childrearing during early child development.

[6] This refers to anthropological understandings of "culture" as the primary human adaptation, rather than as a "barrier" to behaviors that external experts deem are necessary for others to adopt.

Gender roles as they are lived also influence what suggestions are implementable. In addressing how to prevent rural Ethiopian babies from so much exposure to the heavy fecal film that surrounds them, the answer is not to provide busy women with more duties. Mothers are not apathetic about some of the dirty things that go into their children's mouths; they may want to give their toddlers freedom but they also just do not have time to watch their babies.

Luckily, although mothers are the primary caregivers, they are not the only caregivers in the family. Fathers were observed in caregiver roles with their young children, washing their hands and especially, in the absence of the mother, cleaning up their infants after they defecated. These are gender roles and hygiene and childcare practices to validate and further enhance among fathers through SBCC programming.

Many families had older children who could and did mind their younger siblings, although sometimes not as attentively as their mothers would wish. These children are an untapped resource who could be enlisted to prevent young siblings from their zealous oral exploration of their surroundings, as well as to promote other improved hygiene practices in their families. Finally, other family members and relatives, including grandfathers and aunts, were also observed caring for, feeding and washing young children.

Flies are also an important part of the fecal-oral route. Fathers, especially, noted that latrines keep the fly population down and prevent flies from breeding in exposed feces. However, animals are important financial assets and symbols of wealth in rural Ethiopia; flies follow animals and their excrement. It is possible that some of the tolerance for flies was based on their connection to animal wealth. An SBCC program may need to reframe the contextual meaning of flies a bit in order to make it even more attractive to reduce their population.[7]

Researchers observed a great deal of handwashing by many family members, including the use of soap among some of them. Handwashing in the study sites appeared to be an adaptation of the ancient custom of pouring water over the hands from a ewer into a basin or onto the ground. Since the floors of houses were made of packed mud, many people dispensed with a basin and washed their hands over the floor. Instead of an ewer, they used a plastic or pottery jug. This handwashing arrangement has the virtue of being portable: there is no need for a stationary handwashing facility when people are accustomed to taking their handwashing equipment with them- and that is what most people said they did. It is the soap that is usually lacking, as well as consistent handwashing at times that could interrupt the oral-fecal route. Either soap will need to be redefined to be perceived and used as an indispensable and portable part of handwashing, or soap will need to be fixed in a stationary location by the latrine, even if the water and handwashing equipment are mobile.
A few parents commented that handwashing was part of their culture; that they had learned this from their parents and grandparents. To introduce modifications to handwashing, ENGINE will need

[7] Dr. Simpson reported (personal communication) that in some parts of Ethiopia flies are perceived as a sign of wealth because the more animals there, the more flies there are. While this did not seem to be the case in the study areas, there seemed to be a range of mothers' tolerance for flies and mothers were seldom observed trying to reduce the number of flies on their young children.

to fit new practices into the established cultural meanings, logistics, and economics that attach to the current handwashing practices within families' daily lives.

While not all mothers in the three-hour observation were seen to rub their hands three times, a number of people were observed to do this in the WASH observation, although teams were not requested to note this on that observation form. This is a practice that ENGINE can build upon.

This research provides a unique opportunity to compare what people are observed to do, with what they say they know and do. The combination of methodologies employed produce a holistic picture of what life is like for young children in sample areas, as well as their physical and social environments. The data include detailed observation and interview information on handwashing, water retrieval, storage and use, defecation practices, including disposal of feces. While current evidence indicates that washing hands with soap can reduce the risk of diarrheal disease by 42-47 percent (Curtis and Cairncross, 2003), the data generated through ENGINE's study are perhaps unique in documenting the occurrence and causes, and eliciting suggestions for remedying the other 53-58 percent of exposure to diarrheal disease risk factors that hand washing will not help, as well as documenting current hand washing practices and suggesting the reasons behind them.

The lessons for SBCC are clear: enhance existing practices where possible, and assure that any proposed modifications or new practices fit into the daily rhythm of rural families' daily lives, as well as into existing local systems of meanings.

5. Recommendations

5.1 Priority audiences for WASH/SBCC programming

Mothers, fathers and older siblings (especially older sisters) are primary audiences for WASH SBCC programming. Specific SBCC strategies, messages and materials should prioritize these audiences, the findings confirm that hygiene and sanitation practices in the care of infants and young children, like other nutrition-related practices, are a family affair.

5.2 Human-animal separation is an issue best addressed through community organizing strategies to protect livestock, and livelihoods interventions to assist families to build appropriate structures

The human-animal relationship is an integral part of the fabric of family life in rural Ethiopia, and separating humans from their domestic animals will be a challenge for this reason alone. Theft, moreover, is reportedly rampant in many rural areas and presents a critical barrier to improve hygiene practices, since keeping animals close to home- and indeed, within the home- is a coping strategy for families[8]. SBCC programming is therefore secondary to effective interventions that enable families to practice human-animal separation within their social and cultural context.

ENGINE's livelihoods interventions already include providing some support to families to assist them with chicken raising (provision of chickens and support to build improved chicken coops), as well as raising small livestock (sheep and goats). ENGINE can integrate WASH interventions through its livelihoods interventions by:

- Expanding on this support to help families or neighborhoods to construct an extra room onto their houses, or a nearby corral, for animals to sleep at night and for calves and other young animals to stay;
- Integrating within the livelihoods interventions, the use of SBCC materials promoting sweeping compounds, keeping infants and young children away from chickens, livestock, and animal feces.
- ENGINE will need to confirm the modalities for operationalizing the above points- either through HEWs, AEWs, farmers' cooperatives, or other frontline workers.

5.3 Promote the use of clean mats for children's play and eating areas

The findings from this study highlight the plethora of objects that go into the mouths of young children, including animal feces, due to their innate curiosity and the oral phase of their early learning and development. Some of the study families were observed to already use local plastic bags made from sacks, animal skins, or cloths as playing surfaces for their young children. ENGINE's WASH/SBCC programming should include the creative design and promotion of locally-made mats made of plastic or another durable washable material.

[8] *Household Agriculture-Nutrition Practices and their Determinants for Mothers' and Children's Improved Access to Diverse and Quality Foods: A Report on Formative Research Findings and Recommendations for Social and Behavior Change Communication Programming*; ENGINE, 2014.

Over the short-term As part of its SBCC programming, ENGINE should:

(a) design WASH-friendly child mats and promote designated play areas for children that are safe, clean and separated from animal feces. The mats can be distributed and/or promoted through ENGINE's sub-grantee local NGO partners implementing Enhanced Community Conversations (ECCs), HEWs, and government well-baby clinics;
(b) promote carrying young children on the back or holding them in the lap, or keeping them in designated play areas away from animals and feces, regularly sweeping the environs, and encouraging children to play with clean objects rather than dirty objects.

Over the long-term:

(a) ENGINE can also explore the possibility of private sector sponsorship or partnership with local plastics companies, sack manufacturers, and corporations who may be interested in branding and marketing WASH-friendly child feeding/play mats under corporate social responsibility initiatives.

5.4 Promote soap with regular handwashing, through integrated WASH/MIYCN/Agriculture SBCC

The findings in this study reveal that handwashing does occur in most households, although not necessarily at the optimal times, and not routinely with soap. The findings also suggest that soap, rather than ash, appears to be the preferred handwashing aid, even though soap is more expensive than ash, and even though ash is readily available in most family kitchens. Findings from other formative research by ENGINE[9] suggests that this may be because rural Ethiopian families- mothers, fathers, and even grandmothers alike- have a strong aspiration for modernity and a progressive lifestyle. In this other research, macaroni and spaghetti, for example, were revealed as highly desirable foods for rural families, even though these foods are less nutritious, less accessible and probably more expensive than other more nutritious foods.

Over the short-term:

(a) ENGINE should integrate soap promotion into the overall SBCC messaging and materials, in line with other creative concepts used to promote improved IYCF and agriculture-nutrition practices.

Over the long term:

(a) ENGINE could explore whether soap- which is certainly more beneficial to the health and nutritional outcomes of infants and young children than macaroni- can be promoted to be just as desirable.
(b) Beyond SBCC, ENGINE could, once again, explore potential strategic partnerships that would facilitate the social marketing of soap to rural households, so that it is not only desirable, but also more accessible and affordable for people.

[9] *Maternal Diet and Nutrition Practices, and their Determinants in Amhara, Oromia, SNNP and Tigray Regions*; ENGINE; 2014; *Mothers' Infant and Young Child Feeding Practices, and their Determinants in Amhara and Oromia Regions*, ENGINE 2014; and *Fathers' Infant and Young Child Feeding Practices, and their Determinants in Amhara, Oromia, SNNP and Tigray Regions*, ENGINE 2014.

5.5 Hand washing promotion to enhance and improve traditional practices

As noted above, handwashing – although often without soap or ash- does already occur in households, and is viewed as part of the culture. AEWs have also succeeded in making handwashing with soap *before* milking cows a habit for some women, who are apparently strongly encouraged by their husbands to do so. Hand washing- with soap or even without soap- *after* milking cows, however, is unfortunately less of a habit. Women also routinely rinse their hands during meal preparation, beginning with the rinsing of cooking utensils, and then while handling food. Women do not, however, routinely wash their hands with soap and water before serving food to their children or others; and fathers, older siblings and other family members do not practice handwashing prior to giving food to young children either. Families are traditionally using mobile handwashing materials- small jugs for holding and pouring water over hands, sometimes with powdered or bar soap, sometimes with water only. While stationary handwashing facilities, particularly tippy taps, were observed to be present in two households, the findings suggest that this was more for show than for actual use within the 24 households.

Over the short-term:

(a) SBCC programming should focus on reinforcing existing practices of handwashing as part of the rhythm of life, while enhancing these practices to occur at critical times, and to include the use of soap. SBCC strategies promoting optimal handwashing practices should, as noted above, prioritize focusing on mothers, fathers and older siblings of small children, as well as families in general.

(b) Since the promotion of tippy taps is already ongoing through the work of HEWs and other development programs, ENGINE's SBCC programming should continue to promote tippy taps as an option for handwashing. In addition, ENGINE should promote the enhanced use of the mobile handwashing stations that families are more accustomed to-- with improved hygiene practices. ENGINE's ECC sessions should include opportunities for participants to discuss the pros and cons of tippy taps vs. jugs, including the observation that using jugs to wash hands with soap and water may require more water than using tippy taps. Take-home activities during the ECCs should include giving participants the option to wash hands with soap and water, or ash and water, try using either a jug or a tippy tap, and reporting back during the following session.

(c) Develop additional guidance for the use of handwashing stations, for example prioritizing handwashing stations with soap located near places where family eat. The promotion of ash is also ongoing through the work of the HEWs, and should therefore be promoted by ENGINE as an inexpensive option for soap.

5.6 Treating contaminated water

The data indicate that, while potable water sources are available to some households, other households access water in streams where animals drink and defecate, and people wash themselves or their clothes.

Over the short-term:

(1) ENGINE's WASH/SBCC materials should include the promotion of locally available WASH treatment products, such as WaterGuard, Bishangari, or Pur, for families to assure that their children between the ages of 6 – 24 months have clean drinking water.

Over the long-term:

(1) ENGINE could explore the possibility of providing vouchers to beneficiaries to purchase WASH treatment products
(2) ENGINE should also test different water treatment products within a pilot initiative to determine which are most appropriate for families
(3) ENGINE could consider further rapid research to more thoroughly understand families' apparent reticence to use ash, and their apparent preference for soap, is recommended before designing SBCC messages and materials to promote the use of ash- to assure that these will resonate with the audiences and be effective.

5.7 For the longer-term, develop and implement Older Sibling (Big Sister/Big Brother) programs focused on enabling older siblings to improve WASH practices when caring for their younger brothers and sisters

Older siblings, particularly girls, of primary school age are among the frequent caretakers of infants and young children. Some mothers in the study expressed concern that their older children are not vigilant and consistent enough when tasked with watching their younger siblings. ENGINE should therefore develop child-friendly SBCC materials, including songs, games, poems, contests, and take-home activities for dissemination and use through ENGINE-supported primary schools.

Content of these Older Sibling programs should include: sweeping, carrying baby on the child's back, preventing baby from putting contaminated objects in their mouths, keeping baby in clean areas, using the child play/eating mat or cloth, safe and prompt disposal of baby's feces, washing baby after defecation, and washing their hands and their younger siblings' hands with soap and water at critical times.

5.8 Disposal of child feces

Adult family members perceive child feces as benign, and demonstrated inconsistent practices around the handling and disposal of child feces. In some cases, family members promptly disposed of child feces in a latrine, while in other cases, child feces may be wiped with a cloth and left in a room on the floor. Practices for cleaning young children's bottoms after defecation also varied considerably. While mothers as well as fathers were observed to dispose of child feces, older siblings charged with taking care of their younger brothers and sisters were never observed to do so.

Over the short-term:

(a) SBCC programming should communicate that all feces, whether adult, child, poultry or animal, are dangerous and need to be disposed of following recommended practices, including promptly throwing child feces in a latrine, washing the child's bottom with soap and water, washing hands with soap and water after handling feces.

Over the long-term:

(a) ENGINE should explore through additional rapid research (e.g. Trials of Improved Practices) improved practices related to young child defecation. For example, mothers and other older adult female relatives were observed helping their children to learn controlled defecation by balancing them on their feet and encouraging them to defecate on the ground. Rapid research could explore whether it is feasible to promote parents to encourage their young children to defecate in a designated bowl, bag, or on a leaf for immediate disposal.

5.9 Supplementary training for HEWs and AEWs

Over the long-term:

(a) Integrate WASH recommendations into the content of supplementary training for HEWs and AEWs during quarterly meetings

5.10 Integrate the WASH component into the design of an intensive community-based 1000 Day/SBCC campaign focusing on priority audiences and households.

Finally, findings and recommendations from ENGINE's other formative research supporting SBCC programming to improve maternal, infant and young child nutrition practices should be reviewed in conjunction with those of the present study on household WASH practices and used to design an integrated campaign.

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7. Appendixes

Appendix 1: General WASH Practices, Specific Practices and Topics addressed through research instruments.

WASH-Related Practices Observed, Specific Practices and Topics addressed

General WASH Practice	Specific practices and topics addressed through the research instruments
Hand washing practices	• whether or not hands were washed; • if hands were washed, how they were washed, where they were washed • the availability and accessibility of water for hand washing • the availability and use of soap or ash, • the type of containers used for hand washing water; • the presence or absence of a hand washing station (e.g. tippy tap, bowl, etc.) and proximity to where defecation occurs • how hands are dried (e.g., air dried, on a clean cloth, etc.).
Disposal of feces of all family members and domestic animals	• disposal of children's feces; • where male and female adult family members defecate; • the presence or absence of a toilet or latrine; • the distance of latrines from children's home; • the presence or absence of animal feces within the home compound or where under-two year olds play; and • methods and places for disposing of animal feces.
Presence and use of latrines	• whether these exist; • which family members have access to and use a latrine; • how many households share the latrine; • whether the latrine design is improved or not (meaning, if kept clean, whether feces are effectively separated from humans); • the cleanliness of latrine, including the slab, if present, and the surrounding latrine structure; • the distance of the latrine from the hand washing source; and • the distance of the latrine from the house.
Play areas and eating areas	• where children between 6-24 months old play; • what they are doing when they play/how they play; • whether they are in contact with animal feces while playing or eating or could come into contact with it; • observed contact of child with flies, especially on the child's face; • soap or ash at home or in the compound • latrines/toilets/defecation areas • separation of animals and children (e.g., larger animals tied up, corralled, or tended away from play areas, smaller animals in enclosed area or housed away from play areas) • water storage, handling, treatment • the types of surface where children are eating or playing (i.e. degree of cleanliness and hygienic conditions).

General WASH Practice	Specific practices and topics addressed through the research instruments
Water storage and handling	• water storage vessels and whether they are easily accessible to adult or children's hands; • type of water source; • distance to water source; • how water is stored and from where it is obtained and • water disinfection • hand washing practices; and • utensils used to prepare and serve food.
Care and feeding hygiene, with emphasis on children 6-24 months old	• whether children are fed by hand or by a spoon • whether utensils are washed • who takes care of children 6-24 months old

Appendix 2: Lessons Learned by the Research Teams

Several weeks after the data collection, ENGINE asked the twelve Peace Corps Volunteers and twelve Zonal Coordinators to share insights and lessons learned they had gained from participating as researchers in the study. This section summarizes the teams' feedback on their data collection experiences.

5.1 Families' high levels of hospitality and cooperation

Most of the research teams were pleasantly surprised by overall willingness and hospitality of the household families who were being observed. Once it was explained in the local language by the ZCs and/or HEWs that the purpose of the research was to learn from them- rather than to judge them (a fear expressed by some families), families were eager to help by participating in the study. A ZC remarked how "cooperative" families were in "sharing their real experience" and his surprise that the family members did not seem to alter their usual behaviors in fear of judgment.

> **"I was surprised that the family members were so willing to have us in their home and were not bothered by us at all. They let us observe them willingly and did not seem to try and change their behaviors or anything to impress us."**
>
> ***~PCV***

5.2 HEWs' skill in facilitating introductions to family and entry into households

Ethiopia is an incentives-based culture, and research teams initially feared that not providing per-diem or products would discourage families from participating. However, only a few families requested per-diems in exchange for participating in the research and- with the help of local Health Extension Workers (HEW)- this was quickly settled. Having HEWs, who have established excellent relationships with local families, introduce the research teams to the families, and explain the purpose of the study and attain their informed consent proved invaluable. Families agreed to participate without incentives, and were also quite comfortable with having their photos taken. After the study, many research teams shared prints of the photos with the observed families as an informal thank you gift.

5.3 Contradictions between reported and observed behaviors

Many research teams also noted their surprise in observing contradictions between what families reported to be their usual practices, and what they were observed to actually do. The most significant contradictions between reported practices and observed practices entailed handwashing. In addition, the research teams noticed contradictions between the reports by mothers and fathers in the same households, during the individual interviews. For example, mothers and fathers in the same household would sometimes report differently about who takes care of, feeds, bathes and assists the child while he or she is defecating. Prior to the study, all research teams had agreed to conduct the interviews after the observations, so as to reduce the likelihood of family members altering their behaviors after learning the specific interests of the study. The research teams remarked that without the direct observations- which were conducted *before* the interviews- the data reported by the mothers and fathers would have painted an inaccurate picture of the household's WASH-related practices.

5.4 Challenges in conducting individual interviews in a family setting

The research teams learned that the need to arrange a private interview environment in order to obtain honest and accurate information was difficult to explain to the families, not to mention logistically challenging in small household living spaces. Some researchers found creating a closed, intimate interview environment was also difficult due to the presence of family members or others who were curious about the proceedings.

> **"I could see the discomfort of the interviewee, but since everyone was already there it is also difficult culturally to ask everyone to leave. It is important to enforce individual interviewing in the first place."**
>
> ***~PCV***

> **"Sometimes if I would ask a question in different ways I would get different responses, so taking the time to have a conversation and ask further questions to understand certain behaviors was important."**
>
> ***~PCV***

5.5 Household practices that had previously been unknown by the research teams

Although the research teams were composed of PCVs who have been living in rural Ethiopian communities, and Ethiopian project staff who have been working in Ethiopian communities, they nevertheless learned about some routine household practices that came as a surprise to them. For example, one research team was surprised to learn that a mother did not urinate or defecate all day long, due to the lack of privacy- and would wait to relieve herself early in the morning or late at night under the cover of darkness.

5.6 Early child development and learning by imitating

The ZCs and PCVs noted that the toddlers they observed would frequently imitate the handwashing-related behaviors of their family members. One PCV observed a child waving his arms to air-dry, just as his father did earlier.

5.7 The childcare role of older siblings and grandmothers

Research teams noted that they learned a lot about the importance of the roles that family members other than mothers play in caring for the child. Teams observed older sisters as well as older brothers taking on primary caretaker roles when their mother was occupied with housework. One team observed an older brother assisting his young brother to sit on his plastic potty chair, and to wash the young child's hands after he defecated. The older brother also poured water over his mother's hands after she washed his young brother's body after he had defecated.

Another team remarked that they had been "very surprised" to see a child's grandmother offering her legs as a proxy toilet seat for a young child to use to defecate inside the home. This same grandmother also palm-fed milk to the child, pinching the infant's nostrils to urge her to swallow. The research team was surprised and concerned by this behavior, noting "this can potentially can cause aspiration and even lead to death".

5.8 Positive working relationships between research pairs

Many ZCs commented on the positive working relationship in the research teams. They expressed appreciation for the direct, word-for-word translations PCVs sought to gain a more in-depth of understanding of the data they were collecting. Although some pairs found their interview styles did not always match, in general the combination of the PCVs' in-depth interviewing skills and the ZCs' expertise with the local language and social practices resulted in productive teamwork and a mutually beneficial experience.

> **"Working together with the PCVs was very important and the study has established a good relationship between the PCVs with ZCs."**
>
> ***~ZC***
>
> **"My definition of digging [for further information] was much different than my counterpart's, and I attribute that to nothing more than differing culture backgrounds."**
>
> ***~PCV***

5.9 Positive gains

Overall, both the ZCs and the PCVs encountered WASH-related practices that surprised them, because they were outside of their own daily observations while living in Ethiopia. Each research pair gained personal newfound knowledge and understanding of these practices. By conducting such in-depth interviews and lengthy household observations, the teams achieved great insight into typical WASH practices.

The teams had little to no prior experience in rapid qualitative research methodologies, particularly direct observations over extended periods to record families' daily routines. This created a bit of skepticism among some of the researchers. For example, a Zonal Coordinator admitted that prior to the study, he had doubted the study's potential for success, but that by the data collection was complete, the research experience had substantially changed his mind.

> "I have learned what different studies **within the community can address within a very small sample size and within a short period of time."**
>
> ***~ZC***
>
> **I had never really done an observation study (before). I learned how important it is to be really attentive during the observation process and to ask as many questions as possible in order to … get a solid understanding about an issue."**
>
> ***~PCV***
>
> **"By asking such in-depth questions and observing families for such extended periods of time, the ZCs and PCVs gained an appreciation of how influential the findings from this sort of innovative study can be for the development of effective social and behavior change communication (SBCC) interventions to improve WASH-related practices.**
>
> ***~PCV***

Appendix 3: Research Instruments

- 3-hour Hand Washing Observation Checklist
- 12-hour Child Observation Checklist
- Father's WASH Interview
- Household Description
- Mother's/Caretaker's WASH Interview
- WASH Observation Checklist

Your name_____
Village name_____
Region of Ethiopia_____
Date_____ Observe start time_____ end time_____

3-hour Hand Washing Observation Checklist

This checklist is for observing the person in the household who is preparing food.

Activity	Washes hands **before** Activity YES NO		Washes hands **after** Activity YES NO		Uses soap/ash/soil & water YES NO		Rubs hands 3 times or more YES NO		Air dries YES NO		Uses clean cloth/ towel to dry YES NO	
Cooking												
Handling child's feces or urine or wiping child's bottom												
Feeding child												
Breastfeeding child												
Eating												
Defecating/using latrine												
Handling animal feces												
Handling animals												
Touching surface likely to be contaminated (specify below)												
Other occasions (specify)—if not associated with an activity, just note the occasion												

Observer's Name_____
Village _____
Region of Ethiopia_____
Date(s) of observation_____
Hours Child was observed (from-to)_____

12-hour Child OBSERVATION CHECKLIST

6 – 24 Months *(Note: preferably the infant observed has started complementary feeding)*

OBSERVATION	YES	NO	RATING, DESCRIPTION OR COMMENT
Age of child in months:			____ Age in months
What is the child wearing on its bottom? PHOTO			___Nothing ___Underpants ___Diaper ___Pajama bottom
Who took care of child for the majority of the observation? PHOTOS			_____ child's mother _____child's grandmother _____ child's older sister _____child's older brother _____another female adult relative _____another female child relative _____unrelated female adult _____unrelated child _____child's father _____child's grandfather _____other (specify)
Did anyone else take care of the child? (check all relevant categories) PHOTO			_____ child's mother _____child's grandmother _____ child's older sister _____child's older brother _____another female adult relative _____another female child relative _____unrelated female adult _____unrelated child _____child's father _____child's grandfather _____other (specify)
Where did the caregiver place the child when the child was not being held? PHOTO			Please specify (e.g., floor of house, on the ground outside—and location)
Were animals present?			
• **If yes,** which animals PHOTO			__goats ____Others (specify) ___chickens ___cows ___pigeons ____donkeys
Were animal feces present within crawling/toddling			

OBSERVATION	YES	NO	RATING, DESCRIPTION OR COMMENT	
distance of the child? PHOTO				
• **If yes,** specify which one/s			__goats ____Others (specify) ___chickens ___cows ____pigs ____pigeons ____donkeys	
Rate the amount of feces within crawling/toddling distance.			__1 or 2 pieces __a moderate amount __so much it was difficult or impossible to count	
Did the child ever come into direct contact with the animal feces?				
• **If yes,** did the caretaker wash the child immediately after this?				
• **If yes,** did the caretaker use soap & water or ash?				
How many times did the child defecate?			____ (write in number)	*Make a mark for each time*
Where did the child defecate?			__plastic tub or potty __the ground __floor of dwelling __latrine --other (specify)	
How were the feces disposed of? (specify where, if feces were scooped up, what was used to scoop up the feces, did anyone use their hands or other body part to collect the feces; if the feces was left for the animals, was it eaten; where was the feces thrown or placed, e.g., in the latrine, on uncultivated land; on cultivated land; was it wrapped in anything before disposing of it)			Describe child feces disposal:	

OBSERVATION	YES	NO	RATING, DESCRIPTION OR COMMENT
Did any child or adult (including this child) come into bodily contact with the child's feces after it defecated?			
Was the child's bottom wiped?			
With what was the child's bottom wiped (check all that apply)?			___leaf ____cloth or handkerchief ____paper ____Water used to clean child's bottom, child not wiped ____Water used to clean child's bottom, then bottom wiped ____other (specify what)
Who wiped the child?			__Main caretaker __Secondary caretaker __Other (specify)
What happened to the material used to wipe the child's bottom after it had been soiled?			(specify where put or thrown and who did it) ___Thrown in latrine ___Put in family/community garbage pile ___Thrown on cultivated land ___Thrown on uncultivated land ___Other (describe)
Did you see any child or adult come into contact with this soiled material?			
Did you at any time see a child come into contact with animal or human feces?			
If yes, how did this occur?			
If no, How was this prevented? (check all that apply)			___animals kept separately away from child's play area ____child's excrement disposed of away from

OBSERVATION	YES	NO	RATING, DESCRIPTION OR COMMENT
			where child was playing/sitting/lying ___adults did not defecate in areas where child played/lay/sat ___It was just luck (nothing to prevent child from coming into contact) __Other (specify what)
Did the caretaker wash her/his hands after disposing of the child's feces?			Defecation # Hands washed?
Did the caretaker wash her/his hands consistently after disposing of the child's feces?			
Did the caretaker wash her/his own hands after s/he defecated?			Defecation # Hands washed?
Did the caretaker do this consistently?			
Did the caretaker wash her/his hands correctly every time? (used soap, washed thoroughly, used clean towel)			
Did the caretaker wash her/his hands before feeding the child?			Feeding # Hands washed:
Did the caretaker wash her/his hands consistently before feeding the child?			
Did anyone prepare food for the family?			
Did the person who prepared food (cook) wash her/his hands before beginning cooking?			Cooking # Hands washed?
Did that cook use soap and water or ash when he/she washed hands?			
Did that cook rub the hands at least three times while handwashing?			
Did the cook air dry the hands?			
Did the cook wipe the hands on a clean cloth or towel?			
Did anyone wash the child's hands during the day?			
If yes, when			_____After the child defecated

OBSERVATION	YES	NO	RATING, DESCRIPTION OR COMMENT	
			_____After the child came into contact with animal feces _____Before the child ate _____After the child ate _____When the child's hands appeared dirty _____Other (specify when Check all that apply	
How many times did the child put her/his fingers in her/his mouth or nose during the 12-hour observation?			____ (write number)	Count number of times by making marks here
How many times did the child put someone else's finger in his/her mouth or nose during the 12-hour observation?			___(Write number)	
Was the child breastfed during the 12-hour observation?				
Did the mother wash her hands each time before breastfeeding the child?			Remarks:	
For weaned children: how did the child convey food to her/his mouth? PHOTO			____ spoon, fork or other implement _____fingers _____someone else's fingers ____ ate from vessel without touching food _____Other (please specify)	
Did the child wash her/ his hands before eating each time?			Eating # Child's hands washed?	
Did someone else wash the child's hands before the child ate each time? PHOTO				
If the child was fed by hand, did the person wash her/his hands before feeding the child each time?			Feeding # Feeder's hands washed?	
Did the person feeding the child wash hands with soap and water each time?				
Did the person rub his/her hands together at least three times, each time?				
Did the person air dry his/her hands?				
Did the person use a clean-looking cloth or towel to dry hands?				

OBSERVATION	YES	NO	RATING, DESCRIPTION OR COMMENT
Time 2 minutes during the day and count the number of flies on or within 3 feet of the child (when no food has been served or consumed).			Estimate number of flies:
Are flies resting on the child's face during the day?			

Please record each time you observed the child putting something into his/her mouth and what it was.

Time Object put into mouth

Your name_____

Village name_____

Region of Ethiopia_____

Date_____

Household type: Shadowed Child or 2nd household? (Circle)

Father's WASH Interview

"We are trying to learn about some of the challenges families face in sanitation and keeping their children healthy. May I ask you a few questions about that, from a father's point of view?"

1. What is your job and how do you spend your day, usually?

2. Where do your family members defecate?

3. *If the home has no toilet/latri*ne, ask <u>why there is none</u>.

4. *If there is a latrine*, <u>ask who built it and why.</u>

5. Do you see any <u>advantages</u> to having a latrine for your household? Yes or no and why.

6. What are your thoughts/opinions about other people defecating in the open?

7. *If no latrine*, would you be interested in building a latrine? Why or why not?

8. Do you ever take care of the baby in your house? Yes, no, sometimes (circle)

(*This question may need some probing on times of day he cares for baby, things he will and will not do and why, etc*.)

- *If yes*, what do you do?
- Do you feed the baby? Yes, no, sometimes (circle)
- Do you wash your hands before feeding the baby? Yes, no, sometimes (circle)

Please describe the handwashing:

- Do you clean the baby after it defecates? Yes, no, sometimes (circle)
- Do you wash your hands while cleaning up after the baby? Yes, no, sometimes (circle)

Describe the handwashing:

9. Have you ever received any information about handwashing? If yes, what information did you receive and from whom?

10. Do your children sometimes play near or come into contact with animal feces?

11. What is your opinion on small children playing near animal feces or touching them?

12. Do you think it is possible to keep small children away from human and animal feces? If so, what do you do?

13. Have you ever heard that water from some sources can carry diseases? If yes, what did you hear?

14. Do you do anything in your household to ensure that your water is clean? If yes, what do you do? Who does it?

15. What do you see as your role in keeping your family safe from diseases?

Your name_____

Village name_____

Region of Ethiopia_____

Date_____

Household type: Shadowed Child or 2nd household? (Circle)

Has the household consent form been completed? Yes/No (Circle and attach with HH forms)

Has the household signed the photo/video consent form? Yes/No (Circle and attach with HH forms)

Household Description

1. How was this household selected?

2. Who lives in this household? Please list members, sex and ages. Indicate education level of all family members. Circle the study child.
(Get a PHOTO of family members, if possible)

3. What is the means of livelihood of this household? Are any adults wage-earners? What are their occupations?

4. Describe the house (building materials, size, material possessions) and estimate their economic situation.
PHOTO

5. Describe the compound (animals, corrals, chicken coops, tools, containers, food storage buildings)
PHOTO

6. Describe the cleanliness of the house and compound. Note where there is domestic animal excreta.

7. Describe where animals are kept, day and night.

8. Do family members remove their shoes before entering the house? Yes No (circle)

Your name_____

Village name_____

Region of Ethiopia_____

Date_____

Household type: Shadowed Child or 2nd household? (Circle)

Mother's/Caretaker's WASH Interview

NOTE TO INTERVIEWER: Interview either the mother of the household (preferable) or a caretaker at least 14 years old and a member of this household.

What to say: "We are trying to learn about some of the challenges families face in water and sanitation and keeping their children healthy. I would like to ask a few questions to the person who usually takes care of the baby."

GENERAL

1. Who usually takes care of the baby (the study child of 6-24 months)?

Age, sex and relationship of usual child caretaker:

2. Is that caretaker at the house today?
(That person preferably will be interviewed for the rest of the questionnaire.)
Indicate below who is interviewed: the mother or another caretaker. If the usual caretaker is not present, you may wish to choose to go to another household.

START INTERVIEW
3. How do you spend your day, usually?

WHERE CHILDREN PLAY/EXPOSURE TO EXCRETA

4. Where does the baby usually play?

Observation description (note if near animal or human feces):

5. Does the child ever play near places where people defecate?[write down any comments she makes, verbatim]

a. Yes
b. No

i *If yes*, ask: how do adults feel about that? [write down answer verbatim]

ii *If no,* ask: how do people prevent their children from playing near places where people defecate?

6. Does the child ever play near animal feces?

Why or why not?

7. What is your opinion about little children playing near animal feces?

8. Do you think people could do anything to prevent children playing near animal feces?
If so, what?

9. Have you ever heard that water from some sources can carry diseases? If yes, what did you hear?

10. Do you do anything to ensure that the household water is clean? If yes, what do you do?
(*This is asked again below for greater detail. Here the question is open so that she can give us perhaps unexpected answers, like adding a certain leaf, straining, etc.)*

11. What do you see as your role in keeping the child safe from diseases?

WATER

12. Where does this household get water? (*Circle the answer that best fits the respon*se.)

a. Surface water (pond, stream, river)
b. Borehole
c. Protected hand dug shallow well
d. Unprotected hand dug shallow well
e. Protected spring
f. Unprotected springs
g. Buy water from a truck
h. Stand pipe (community piped water)
i. Stand pipe (household piped water)
h. bottled water
i. Other (specify)

13. How long does it take to go, collect water, and bring it back to the home?

Time:
Kilometers:

14. Who usually collects water for the household? Who also sometimes collects it?

15. Do you pay for water?
    a. Yes
    b. No
    c. Sometimes

If yes, how much do you pay per 20-liters (jerry can or clay jug)?

***Ask the mother/caretaker to take you to where the family gets its water (if not today, then go with her another day in this week*).**

16. How far is the water source from the closest area where people or animals defecate? (estimate—in feet)

17. Is the water source uphill from, downhill from or level with the place where people defecate?
    i. Uphill
    ii. Downhill
    iii. About level

18. How much water is collected each day for the household?

19. What kind of container is used to collect water?

20. What kind of container is used to store water? *(If you have already seen this, you need not ask.)*

21. Is the water treated before using? (circle)
    - .Yes
    - No
    - Sometimes

22. If it is treated, how do you treat it?
    c. Boiling
    d. Water treatment packets, etc. [*Ask to see one and write down the kind]
    e. Bleach (chlorine)
    f. Solar disinfection
    g. Filtration
    h. Other (specify)

*Kind of water treatment packaged product used.

23. If you treat water, when did you start treating the water?

SANITATION

24. What do you do with little baby's feces?

    i. Put in latrine
    j. Throw on uncultivated land

k. Throw on cultivated land (as fertilizer)
l. Leave to dry out or for animals to eat
m. Other (specify)

25. *If the family uses a latrine*, ask:

How many families use the latrine?

i. Only this family
ii. This family and one other
iii. This family and two other families
iv. This family and more than two other families
v. It is a community latrine
vi. The family uses a nearby public latrine (e.g., in a school, market, mosque or church or bus station)

26. If the family has a latrine, but it is not functional, ask:

i How did the latrine break/become dysfunctional? (write down the full answer)

ii Are there any plans to fix the latrine?

a. Yes
b. No

iii Who would get the latrine back in working order? (write down the answer)

iv How long has the latrine been out of order?

a. 2 weeks or less
b. 2 weeks to one month
c. 1-2 months
d. 2-5 months
e. 6 months – 1 year
f. Over 1 year

27. *If the family practices open defecation*, ask:

How do you feel about latrines? (write down answer *verbatim*)

28. Would you like to build a latrine? Why or why not?

vii. Yes
viii. No

29. If Yes, If you built a latrine, which of the family members would use it? (Write down who in the family would use it or write 'no one would use it') (If someone will not use it, please probe why and explain.)

30. Is there anything about defecating [use a polite word in the local language] outside that you prefer?

HANDWASHING

31. When do you usually wash your hands?

32. Have you ever received any information from health worker or other person on handwashing? If yes, what did they tell you?

Your name_____

Village name_____

Region of Ethiopia_____

Date_____

Household type: Shadowed Child or 2nd household? (Circle)

WASH Observation Checklist

WATER STORAGE OBSERVATION

Look around and observe the place where the family's water is stored. Ask permission to take a picture of the water storage vessels with your phone. Put the picture in a text with the date, village name, and name of the woreda.

Where does the family store its water?			Describe the storage vessel(s):
	Yes	No	
Does the storage vessel(s) have a spout?			
Does the storage vessel (s) pour?			
If open jar, is the water storage container covered?			
Does the water storage container(s) have a mouth large enough for an adult's hand to fit inside?			
Does the water storage container(s) have a mouth large enough for a child's hand to fit inside?			
If you saw someone in the household get water from the container, did the person's hands touch the water?			
Was a dipper used?			

SANITATION OBSERVATION

1. Ask the mother to take you where the family defecates and urinates. Ask the mother whether she minds you taking a picture of her sanitary facilities. Save the picture in a text and write down the date, village name, and regional name.

2. If there is a latrine, describe the latrine here, <u>including the slab</u>, if any. Describe the superstructure and the amount of privacy it has.

   How latrine is made:

   How far is the latrine from the house? (in meters or walking time)

   Cleanliness and smell:

   a. Sniff: does it smell? (rate it on a scale of 1-5 of slight smell to strong smell.)

      1 2 3 4 5

   b. Look: is the plate free of feces? Are there feces on the floor or walls of the latrine?

   c. Are there flies?

   d. Are there mosquitoes?

   e. How many families use the latrine?

   f. How many persons use it?

   g. Is it a community latrine?

Ask whether there is a different place (even if it's open defecation) to defecate for women and men? For children?
In this culture, are there people in the household who cannot share a latrine?

HANDWASHING

	Yes	No	
Is there a place to wash hands in the household or near the toilet?			Describe handwashing place:
Is soap or ash easily available for handwashing? *If ash is available, is it used?*			Describe type of soap or say ash:
Is there a clean cloth, towel, leaves, or other clean method to dry hands near the designated place to wash hands?			Describe how hands are dried:
Did you see anyone in the household wash their hands? If yes, please list who: child, mother, father, grandparent, etc.			(report for all observed handwashing) 1. 2. 3. 4. 5.

If yes, what was the hand washer(s) doing just before washing their hands?			(report for all observed handwashing) 1. 2. 3. 4 5.
• Did the person use soap or ash? Please write soap or ash beside each number.			1. 2. 3. 4. 5.
• Did the person rub her/his hands together at least 3 times?			1. 2. 3. 4. 5.
• If soap and water, did the person air dry the hands?			1. 2. 3. 4. 5.
• Did the person wipe the hands with a clean cloth, towel or leaf?			1. 2. 3. 4. 5.
• Did the person use a dirty cloth or rag to dry the hands?			1. 2. 3. 4. 5.
• If a child, did the mother help the child to wash the hands?			
• About how old was the child?			
• In what part of the yard, house, compound, etc. did the person wash the hands?			1. 2. 3. 4. 5.
Cooking/Food Preparation area **Describe and note cleanliness:**			

Cooking/Food Preparation area (continued from previous page)

Describe and note cleanliness:

_____

Elderly Defecation

Did you see an old or disabled person in the household?			
Did you see where they defecated?			
If yes, where?			
If not in the same place as other adults, what was done with their feces and by whom?			
Based on the answers to where people defecate in the open, go to those areas and look for feces. Is it likely that someone could inadvertently step on the feces?			

Appendix 4. Shadowed Child's Contact with Animals and Animal Feces

Research Team	Research Site			Number of Different Types Animals Present	Type of Animals Present	Animal Feces in Reach/ Crawling/ Toddling Distance	Direct contact with the Feces by Baby
	Woreda	Region	Region				
1	Bure	W. Gojjam	Amhara	5	Sheep, cows, goat, chickens, dogs	yes	no*
2	Dembecha	Gojjam	Amhara	2	Cows, chicken	yes	yes
3	Efrata Gidem	N. Shewa	Amhara	5	Camel, weaver birds, cows, chickens, dog	yes	yes
4	Lumame	Gojjam	Amhara	2	Cows, chickens	yes	yes
5	Woreta/Fogera	S. Gondar	Amhara	3	Pigeons**, sheep, chickens	no	yes
6	Sinana	Bale Robe	E. Oromia	7	Goats, horse, sheep, cows, chickens, donkey, mule	yes	yes
7	Ambo	W. Shewa	W. Oromia	3	Kitten, cows, chickens	yes	yes
8	Gimbi	W. Welega	W. Oromia	3	Cows, chickens, neighbor's dog	yes	no
9	Bolosse Soro	Waleyta	SNNPR	2	Cow, chickens	yes	yes
10	Decha	Kafa	SNNPR	3	Sheep, cow, chickens	yes	yes
11	Dilla	Gedeo	SNNPR	2	Sheep, one chicken (may have been neighbor's)	yes	no***
12	Alamata	S. Tigray	Tigray	3	Sheep, cow, chicken	yes	yes
						11 yes, 1 no	9 yes, 3 no

*Research team reported that it was just luck that child didn't come into contact with animal feces, as there was nothing that would have prevented it.

**Pigeons may have been domesticated for food

***Research team observed that animals were kept away from the living area and the living area was kept clean; it appeared that the presence of animal feces was unusual in this particular household.

The Woreta and Decha households had one or two pieces of feces, and the Ambo and Bolosse Soro households had animal feces too numerous to count. The remaining eight households had a moderate amount of feces.

Presence of animals did not correlate exactly with amount of feces present in the household, nor with whether the child was observed to have come into direct contact with the animal feces. For example, the Dilla household did not own any of their own animals and the child did not come into contact with animal feces, but there were animals and feces present nonetheless (e.g., a neighbor's chicken). The Sinana household, on the other hand, owned the most different kinds of animals, but did not have any more feces present than most of the other households.

Appendix 5. Latrine Cleanliness and Presence of Feces on Slab/Plate, Walls, Floor

Yes--present	No—no feces	A little	A lot	Comments
X				On slab and hole opening
	X			
	X			
X				
X				
X			X	Lots of feces visible
X				
X			X	On the slab but nowhere else
X		X		
	X			Possibly some stains from dried feces; unclear to PCV
	X			
	X			
X				There is no plate; feces on the floor
X				On the floor
	X			
	X			
	X			
	X			The latrine is kept clean but the floor is damp and appears to be growing mold
9	9	1	2	12 had visible feces and 9 had none

Appendix 6. Shadowed Children's Observed Defecation Practices

Woreda	Child's Age (months)	Child's Gender	Where Defecated	How Child Cleaned	Who Cleaned	Feces Disposal
Bure	20	M	ground	Wiped child's bottom with leaf, threw leaf in garden	Mother	1st time was left; 2nd time covered with hay
Dembecha	14	F	ground	Wiped child's bottom with leaf	Mother	Picked up feces with leaf, threw in latrine
Efrata	11	M	floor of house	Wiped child with the pajama pants he had just soiled and some paper	Mother	Paper thrown in latrine, pajama pants placed on floor of bedroom
Lumame	16	M	ground	Cleaned child's bottom with water, not wiped; one of the times the child stepped in his feces, mother wiped away the feces from child's shoes using grass	Mother	Picked up feces with plastic and threw in latrine
Woreta	21	M	Plastic tub/potty	1st observed defecation: Old piece of plastic used to wipe child's bottom - - Older brother removed child's shirt with feces on it	Mother Older brother	1st: Piece of plastic with feces thrown in latrine— Potty rinsed with water, scrubbed with old newspaper, and rinsed again all waste and water thrown in latrine 2nd: cardboard with feces thrown in dead garden; feces in potty thrown in latrine

Woreda	Child's Age (months)	Child's Gender	Where Defecated	How Child Cleaned	Who Cleaned	Feces Disposal
				2nd observed defecation: Old piece of cardboard used to wipe child's bottom		and potty rinsed with water
Sinana	8	M	in bed during nap	bathed	Mother	Mother removed child's clothing with feces, used chld's bath water to wash the child's soiled clothes (without removing the feces), the water was thrown into dirt behind where mother stood
Ambo	9	F	floor of house, while grandmother held her between her legs	Wiped with leaf	Grandmother	Leaf and feces thrown on currently uncultivated land
Gimbi	15	F	ground	Wiped with paper	Mother	Disposed of paper and feces in latrine
Bolosse Soro	12	?	1st defecation: floor of house 2nd defecation: on cloth placed on ground outside that child was sitting on Eventually father bathed baby after he noticed that no one else had noticed	1st: Wiped with cloth, washed with water, then dried with cloth's unsoiled end 2nd: seems that no one noticed the child had defecated	Mother, helped by child's older sibling	Material used to clean child after 1st defecation put in another part of the house; 2nd defecation— eventually father noticed and bathed the baby

Woreda	Child's Age (months)	Child's Gender	Where Defecated	How Child Cleaned	Who Cleaned	Feces Disposal
Decha	24	M	No defecation observed during 2, 6 hour observation periods	NA	NA	NA
Dilla	24	F	latrine	1st defecation wiped with leaf; second no wiping	Oldest daughter in HH	Child walked to latrine on her own
Alamata	23	M	ground	4 defecations: some leaf was used to wipe, some paper was used, some the child tried to wipe himself	Mother, child himself	When the child defecated outside the compound, feces remained; when he defecated inside the compound, feces scooped up with shovel and thrown on uncultivated land

Appendix 7. Observed Handwashing of All Family Members

Person washing hands*	Occasion
Mother	After cleaning house, after cleaning up child's feces outside; after urinating outside near the latrine
Mother	Before preparing food; before and after touching mud to make mud tables; after making cow dung patties
6 –year-old girl	When her mother told her to, at seemingly random times [observers noted that this might be due to the researcher effect]
20 month old boy	After he was breastfed in the morning [*this may have been part of his daily bath]
Mother and oldest child	Mother washed the child's hands. Before she washed her child's hand, she poured water from the jerry can into a smaller jug and washed her own hands.
Mother	Researchers were unable to observe the occasion
Father	Researchers were unable to observe the occasion
Child	After eating
Mother	After housework, after yard work
Child	After playing outdoors
No handwashing observed	If the mother's hands got wet, she would rub them on her clothes to dry
Mother	Before eating
Baby	Was given full bath in a bucket after being breastfed in the morning
Grandfather	Prior to eating his son brought jug of water to table, poured over the grandfather's hands, caught the dirty water in small bucket below; no soap but rubbed hands-prior to a meal
Mother	(twice) After washing and handling dried herbs
Mother	While washing cooking materials and preparing food
Mother	While cleaning cooking utensils and cooking
Grandfather	Preparing to pray
Mother	While cooking
Four children	After sitting, playing outside and inside the house, before eating, while helping mother to cook
Mother	While preparing food, after collecting firewood
Father	Before and after eating
Mother	While washing mango and feeding child
Father	Before eating a snack and before drinking coffee
Mother	Before cooking for the baby, before taking care of the baby
Father and baby	Father washed baby's face and baby washed by father after the baby defecated
Father	After working in the fields
Guests	Upon entering the house for the first time, before a coffee ritual
Children	Occasion not mentioned
Mother	After roasting corn and preparing coffee for ritual
Father, grandfather, guests	Before coffee ritual
Adult daughter	After cooking
Adolescent son	Cleaning cup while helping with cooking
Father	After sitting around
Observed child	After playing in the dirt
Mother	As part of food preparation
Mother	Before cooking and constantly while cooking, before and after eating
Father	Before and after eating
Children	Before and after eating

*Each handwasher's identity is only mentioned once together with all the occasions that person was observed to wash hands

Appendix 8. Shadowed Mothers' Handwashing Practices during Three-Hour Handwashing Observations

Activity	HW* *Before*		HW *After*		Use soap, ash, soil with water		Rubs hands ≥ 3 times		Air dries		Dries with clean towel/cloth	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Cooking	7	3	3	6	1	6	5	2	6	1	0	7
Handling child's feces, urine, wiping child's bottom	1	5	4	2	0	4	3	1	3	1	0	4
Feeding child	3	7	2	8	1	3	2	2	3	1	0	4
Breastfeeding	0	9	0	9	0	0	0	0	0	0	0	0
Eating	6	3	4	4	0	6	4	2	5	0	0	5
Defecating/Using latrine	0	4	3	1	1	2	2	1	2	1	0	3
Handling animal feces	0	5	3	2	0	3	3	0	3	0	0	3
Handling animals	1	8	1	9	1	1	2	0	2	0	0	2
Touching likely contaminated surface	0	10	3	7	1	3	2	2	4	0	0	0
Other occasions:												
Cleaning house	2	2	1	3	0	4	2	2	1	3	1	3
Washing baby	0	2	1	1	0	1	0	1	1	1	0	1

*HW= hand washing

Appendix 9: Field Notes of a 3 Hour Observation

Excerpt from Field Notes of a 3 Hour Observation	
2:37pm	Started consent process with mother, few questions answered
2:45pm	Mother Signs Consent
2:46pm	Child sitting on floor, no pants. Takes injera from mother, eats some and passes to other boy. Drops some on mud floor.
2:47pm	Child plays with wrapper on floor, putting in mouth
2:49pm	Child crawling on floor, goes to door looking outside, mother sits on floor inside near the child. Mother plays with string on ground.
2:51pm	Mother drinks local beer from stainless glass
2:52pm	Mother places child on lap, bare bottom towards her dress and scarf wrapped around her waist
2:53pm	Mothers hands brush across child's bottom and privates
	Some time the mother starts to feel uncomfortable so I stop writing, only for important things
3:17pm	Child sneezes, mother wipes with hand and wipes on bottom of dress near her leg.
3:28pm	Chis is breastfeeding from left breast with hands pulling up to him as he feeds
3:32pm	Mother tells child he is finished eating, child will not let go of breast and she pulls away.
3:46pm	Child looks to be teething, mother puts the string into the child'aas mouth, which has been on the floor.
3:47pm	Mother leaves home, goes outside and next door to her home to start cleaning, sweeping the floor.
3:57pm	Finished sweeping, grabs pule with hands and places in weaved plate and throws out of house, Sets broom outside of house.
3:59pm	Child breastfeeding on left breast while sitting and mother starts to prepare a meal, has onions on the weaved plate
4:04pm	Hands child over to other child. Gets water from jerry can (lid) and uses to wash a large basin and her hands. She sets the tin can on top of the jerry can.
4:05pm	She gathers ingredients for preparation of a meal.
4:08pm	She opens a storage sack with her teeth (contains potatoes) and places them on the weaved plate (same as before) unwashed while she is sitting on the ground
4:10pm	Mother drinks a coffee brought by the neighbor child
4:11pm	The mother places handfuls of potatoes onto a plastic plate (unwashed) placing the leftover potatoes in a different bag and stores on the open shelf
4:12pm	Places the plastic plate with potatoes on the shelf and wipes her runny nose on the bottom of her dress
4:14pm	The mother prepares a metal disc, wipes with hand (seems to have old wheat or teff flour residue on it) unwashed (hands and disc) she dumps corn from a bag into the large metal disc and scoops with her hands platefuls of corn to the weaved plate (same as before) meanwhile, the child is playing with the corn, in/out of mouth and back into the mixture. The mother dumps the corn from the weaved plate into a large basin which was washed earlier with water.
4:18pm	The mother gathers more corn and places in the weaved basked to take to the relatives house.
4:23pm	She takes the corn to the other house and gives to the mother. They are sharing the bag of corn that was purchased from the market. (NOTE: the previous hygiene might not be thought of and could effect how the family uses)
4:27pm	The mother returns to the house, wipes her face, eyes and nose on the bottom of her dress. The same area used as the child. She grabs a plateful of corn from the large basin, to the weaved plate, and back to the storage bag. Some corn falls on the ground and she places it back into the large basin.
4:30pm	The mother places 5 platefuls of corn on the weaved plate and then dips the tin can into the clay jug to fill the 3 L jug. She then pours the corn from the weaved plate into the clay jug to let the corn soak in the water.

Excerpt from Field Notes of a 3 Hour Observation	
4:32pm	The last 2 plates of corn are placed into the weaved plate and added to the clay jug, scooping the last few handfuls from the large basin to the jug. The jug is then covered with a metal plate.
4:34pm	The hungry child feeds again on the left breast while she sits and cleans the floor of leftover corn which she adds to the clay jug. Still feeding the child and standing and sitting. She then sets the large metal disc against the wall behind a bench inside the living room
4:35pm	She pours a bag of beans to the weaved plate and takes a mug (unwashed) adding half to a bag and half to a colored weaved plate. The child is still feeding but now hanging down towards the breast, again the child is playing with the food while the mother is preparing.
4:37pm	The child finished feeding. She sorts the last cup with her hands, leaving leftover grain in the weaved plate. The bag is taken to the neighbor.
4:42pm	The leftover grain is added to the storage bag while the child is playing with the beans on the colored weaved plate, sitting with his bare bottom and feet inside touching the beans. The child then urinates in and out of the colored weaved plate on the beans. She pours the beans onto the original weaved plate.
4:44pm	The mother breaks apart sugar cane with knife (unwashed) and smacks on the dirt floor to break it in half and gives to the child.
4:45pm	Mother picks up spilled beans from the dirt floor and places with other beans in the weaved plate. She covers the weaved plate with the colored weave plate which was urinated on and never washed.
4:46pm	She gathers all leftover beans and corn from the dirt floor and places in the clay jug and weaved plate respectively.
4:48pm	The mother places the child on her back and wraps with a scarf/blanket
4:49pm	She gathers some sticks from right outside the door and brings into the kitchen to start a fire
4:51pm	The tin can used (washed with water) to give water from the jerry can to the Health Extension Worker. The mother washers her hands with water (less than 3 sec.) and dries on the curtain in the kitchen
4:52pm	Lights fire
4:53pm	She empties the tea kettle and fills it with water from the 3 Liter jug (water was originally from the clay jug) and places the kettle on the fire.
4:55pm	Potatoes were taken from a medium basin to the plastic plate. A medium size pan was washed with water (food was left on it previously) in doorway.
4:56pm	She adds 2 tins of water from the jerry can
4:57pm	She starts to peel potatoes with knife (unwashed) adding to the pan with water
4:59pm	The child drops the sugar can onto the dirt floor and the mother takes the child off her back, wipes the sugar can on her dress and gives back to the child.
5:03pm	Dust blowing into the house from the open front door (partially blinding for a second)
5:04pm	The child playing in the pan of peeled potatoes, putting fingers in the water. The mother moves the pan away repeatedly
5:05pm	The child places the sugar cane end into the fire and the mother pulls out and gives it right back to the child
5:06pm	The child is playing with the lid of the jerry can which is loose. The lid falls to the dirt floor and the child places his hand inside the jerry can playing with the water. Neighbor child notices and tells the mother. She takes the child away and places the lid back on, tight this time!
5:14pm	She has finished peeling the potatoes and starts to peel the onions on the floor, placing the peeled onions on the plastic plate
5:16pm	The child has defecated outside and the mother is told by a neighbor child and puts the child inside the house. She goes to clean up the feces by scooping dirt onto the feces with her hands. She then grabs some leaves to pick up the feces/dirt mixture. Meanwhile, the other neighborhood children go right back to playing where the child has defecated.

Excerpt from Field Notes of a 3 Hour Observation	
5:18pm	The mother has taken the leaf/feces/dirt mixture and thrown near the latrine area outside. She squats outside the latrine appearing to urinate (hard to tell due to dress) Then grabs more tinder for the fire. Does not wash her hands.
5:20pm	Returns to the home, picks up the child and places him on her back.
5:22pm	She stokes the fire and then washes her hands using the tin can with water from the jerry can. She also washes her face, then washes the tin (ONLY water) and then washes lower part of her legs.
5:28pm	She has finished peeling the onions and starts to chop them on the plastic plate
5:37pm	She continues to chop the onions.

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